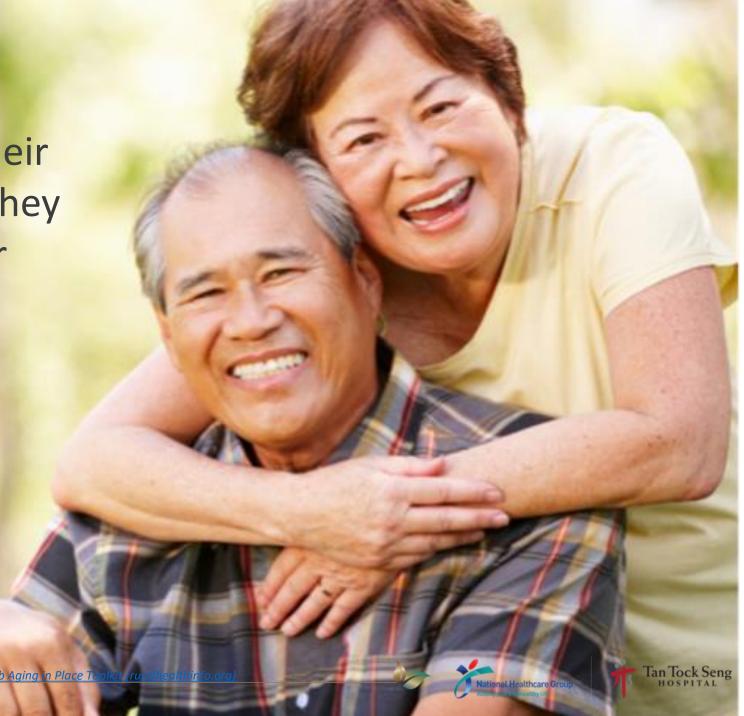


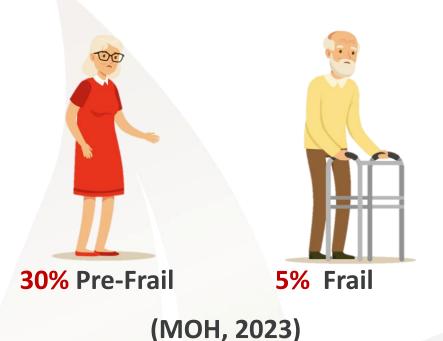
"Ageing in Place"

"Older adults remaining in their homes and communities as they age, rather than relocating or moving into an institutional setting"



Frailty & Dementia

Frailty % (SG Senior Population)



"Expected to grow exponentially, from 5-6% currently to 27% in 2030" (The Straits Times, 2024)

Dementia % (SG Senior Population)



1 in 10 seniors (> 60 years) have dementia

"Number of persons with dementia...is expected to increase to 152,000 by 2030"

(MOH, 2023)

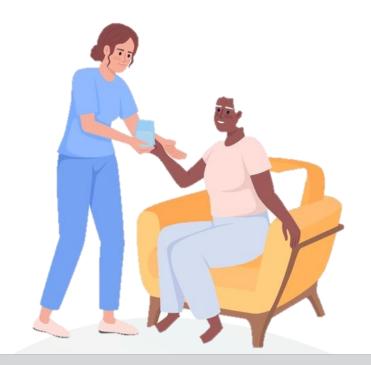




Caregivers

Self-Identify as Caregivers (SG Senior Population)

70% of caregivers are aged 40 years old and above. (CNA, 2019)



"Caregivers deal with the physical, financial and psycho-social responsibilities of caring for the elderly and the young" (MSF, 2021)

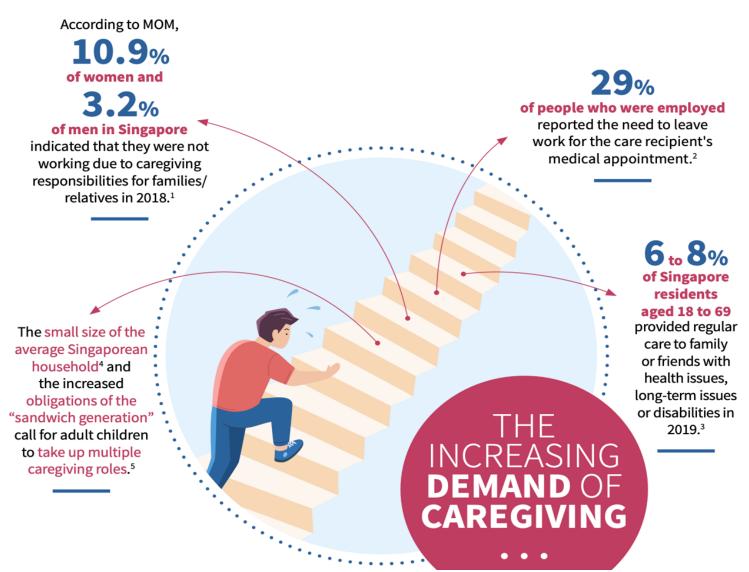
"There is an estimated more than 210,000 full-time caregivers in Singapore..."







"Ageing in Place" – Impact on Caregivers



The demand of caregiving is likely to grow in the near future as Singapore's population continues to age rapidly

In **2030**, **1 in 4**Singaporeans will be aged 65 and above.

Family size shrinking - old-age support ratio decrease from **4.8 today to 2.7**







"Care for the Caregivers" – Why is it important?

Based on:

Stakeholder engagement with more than 30 caregivers since 2022

Survey conducted on over 200 family caregivers community-dwelling older adults at Memory Clinic from 2018 - 2019 In-depth interviews with 43 family

caregivers of older persons

Baseline study

of 72 caregivers looking after patients 65 years old and above in 2022

Survey

conducted on 274
family caregivers
of dependent
persons
hospitalized from
2015-2017

Common pain points:

Challenges in Direct Care

High Cost of Caregiving

Poor Caregiver Well-Being

Navigating Online Resources

Accessing Community
Resources







Literature

Review







"Care for the Caregivers" – In their words

"I have done all sorts of things, suffered..., I feel so numb" (P2) (Chew et al 2022)

"I don't even have any **time for myself**" (P16) (Ong et al 2021)

"I am very tired. I am (so) tired that **I (can) drop dead** " (P11) (Chew et al 2022)

"There's a mental torture in me I think like during wartime." (P9) (Chan et al 2019)

"(Other family members) don't want to learn (how to help)" (P4) (Ong et al 2021)

Chan EY, et al. Crossing, Trudging and Settling: A phenomenological inquiry into lived experience of Asian family caregivers of older persons with dementia. Geriatr Nurs. 2019 Sep-Oct;40(5):502-509. Chew EYH, et al. '24/7' Caregiving: A Qualitative Analysis of an Emerging Phenomenon of Interest in Caregiving. Int J Environ Res Public Health. 2022 Dec 19;19(24):17046.

Ong ZL, et al. Four of a kind: Salient caregiver archetypes to better understand the psychosocial needs and behavioral patterns of dementia caregivers in Singapore. Geriatr Nurs. 2022 Jan-Feb;43:299-308.







"By, With and Through" engagement of research with caregivers

Project MACE Launched & Analysed (2015- 2017)

First hospital-wide research study following up with caregivers of older adults for 6 months post-discharge

Project CHAT-MI Launched

Assessment of caregiving stress and deployment of matrix of interventions for caregivers of persons with dementia

Applied for MOH-National Innovation Challenge

United NHGHQ, TTSH and community partners to develop proposal for technology-enabled solutions to support caregivers

PCM2 studies

Baseline cohort study of 72 caregiver-patient dyads, following up for 3 months post-discharge. Plannning of feasibility study of PCM2 solutions using mixed-methods.

TTSH Care Model

Evaluation of effectiveness of TTSH Caregiver centric Care Model on patient-caregiver.

2015

2017

2019

2021

2023



2025



2016

1

2018

2020



2022



2024

NGT Video Primer Project

Demonstrated effectiveness of video priming of caregivers prior to learning NGT skill

Identified stressors and journey of caregivers coping with NGT for first time at home post-discharge

Project CHAT Launched

Development of short-form caregiver burden and personal mastery scales to facilitate clinician assessment of carer stress and coping capacity

Project Carer Matters Launched

Established prototype caregiverfocused service to holistically support caregivers transitioning from hospital to home.

Project Carer Matters 2 (PCM2) Launched

Awarded \$8.4 million to conceptualize, develop, prototype, deploy, evaluate and scale-up technology-enabled soliutions to support caregivers of older persons

PCM2 Proof of Value Testing

Completed mixedmethods evaluation of PCM2 solutions.

Positive feedback received on solutions, validating their value and potential.

g

Adding years of healthy life

Project MACE (2015-2017)- Caregivers at risk



Followed up 274 caregivers of older persons for 6 months postdischarge

1 in 3 caregivers of older patients in our hospital screened positive for risk of depression, high anxiety and poor quality of life

Unmet psychosocial needs and don't know where to find help.

Increased risk of hospitalization and institutionalization of care recipient

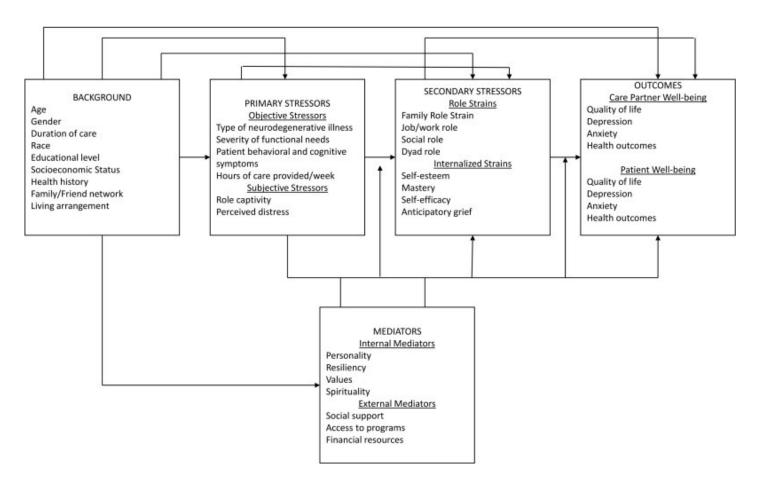
Chan EY, et al. Relationship between Mastery and Caregiving Competence in Protecting against Burden, Anxiety and Depression among Caregivers of Frail Older Adults. J Nutr Health Aging. 2018;22(10):1238-1245. Chan EY, et al. Crossing, Trudging and Settling: A phenomenological inquiry into lived experience of Asian family caregivers of older persons with dementia. Geriatr Nurs. 2019 Sep-Oct;40(5):502-509. Chan EY, et al. Development of a Brief Caregiver-centric Screening Tool to Identify Risk of Depression among Caregivers of Hospitalized Older Adults. J Nutr Health Aging. 2019;23(6):578-585. Ong ZL, et al. Four of a kind: Salient caregiver archetypes to better understand the psychosocial needs and behavioral patterns of dementia caregivers in Singapore. Geriatr Nurs. 2022 Jan-Feb;43:299-308.







Project MACE (2015-2017) – Mastery



High mastery: Increased sense of control over person's life

Mastery found to have a protective effect against depressive symptoms in caregivers (β = -0.51, F = 17,65, p < 0.001)

Potentially modifiable, raising mastery can improve caregivers' capacity to cope

Chan EY, et al. Relationship between Mastery and Caregiving Competence in Protecting against Burden, Anxiety and Depression among Caregivers of Frail Older Adults. J Nutr Health Aging. 2018;22(10):1238-1245. Chan EY, et al. Development of a Brief Caregiver-centric Screening Tool to Identify Risk of Depression among Caregivers of Hospitalized Older Adults. J Nutr Hlth Aging. 2019;23(6):578-585. Pearlin LI, et al. Caregiving and the stress process: an overview of concepts and their measures. Gerontologist. 1990 Oct;30(5):583-94.



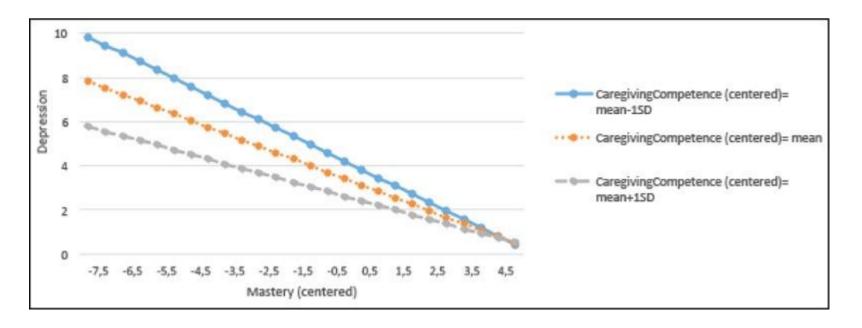




Project MACE (2015-2017) - Mastery

Caregivers with higher mastery reported lower levels of depression

Association stronger among caregivers with lower levels of perceived competence in their caregiving => Having an overall sense of control over their lives could help overcome sense of inadequacy in caregiving "Things are not perfect but I can handle this"



Chan EY, et al. Relationship between Mastery and Caregiving Competence in Protecting against Burden, Anxiety and Depression among Caregivers of Frail Older Adults. J Nutr Health Aging. 2018;22(10):1238-1245. Chan EY, et al. Development of a Brief Caregiver-centric Screening Tool to Identify Risk of Depression among Caregivers of Hospitalized Older Adults. J Nutr Health Aging. 2019;23(6):578-85. Pearlin LI, et al. Caregiving and the stress process: an overview of concepts and their measures. Gerontologist. 1990 Oct;30(5):583-94.





Nasogastric Tube Video Primer Study (2016)

Examined effect of video-enhanced training for caregivers learning nasogastric tube feeding in hospital

Video-enhanced training increased median number of correct steps during first attempt by 40% from 5.0 (IQR: 3.5-6.0) to 7.0 (IQR 3.5 – 7.5)

75% of caregivers receiving video-enhanced training completed training in 6 sessions, compared to 9.3 if they received standard training => Potential to save 1 day of hospital stay



Kwok MWS, et al. I see, I learn, I do: Development and evaluation of a video-enhanced nasogastric tube feeding training programme for caregivers. Nurs Open. 2023 Apr;10(4):2357-2365.

Loke SXY, et al. Transiting Back Home: Caregivers' Lived Experiences in Caring for Loved Ones on the Nasogastric Tube in the Home-Setting in Singapore. J Transcult Nurs. 2023 Sep;34(5):343-355.







Project CHAT-MI (2018-2019)

Hybrid Burden-Mastery Tool Mastery-5

How strongly do you agree or disagree with these statements about yourself?

There is really no way I can solve some of the problems I have.

I have little control over the things that happen to me.

I often feel helpless in dealing with life's problems.

Sometimes I feel that I am being pushed around in life.

There is little I can do to change many of the important things in my life.

ZBI Burden

After I became a caregiver...

I feel I don't have enough time for myself.

I feel stressed between caring for my care recipient and trying to meet other responsibilities for my family or work.

I feel that my social life has suffered because I am caring for my care recipient.

I feel I will be unable to take care of my care recipient much longer.

I feel I have lost control of my life.

I feel strained when I am around my care recipient.

I feel that my health has suffered because of my involvement with my care recipient.

I feel I should be doing more for my care recipient.

Established short-form caregiver burden and mastery assessment tool, pair it with matrix of interventions to guide clinicians

Tested in outpatient memory clinic setting in Singapore for caregivers of persons newly diagnosed with dementia

88% of caregivers found screening tool easy to understand

Matrix tool found to be acceptable, feasible and useful

I feel I could do a better job in caring for my care recipient.

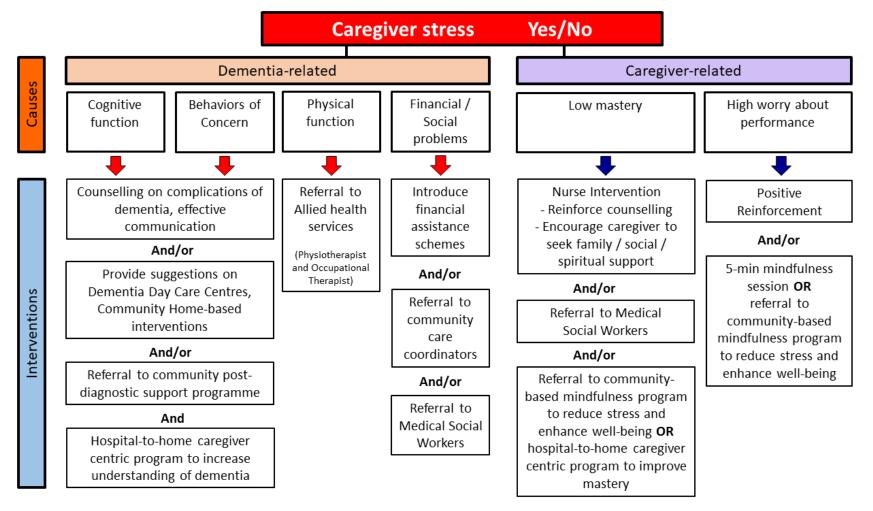
Lim ZX, et al. Psychometrics of the Pearlin Mastery Scale among Family Caregivers of Older Adults Who Require Assistance in Activities of Daily Living. Int J Environ Res Public Health. 2022 Apr 12;19(8):4639. Lim ZX et al. Development and Validation of a Multidimensional Short Version Zarit Burden Interview (ZBI-9) for Caregivers of Persons With Cognitive Impairment. Alzheimer Dis Assoc Disord. 2023 Jan-Mar 01;37(1):59-65. Chan EY, et al. Exploring the Feasibility of a Caregiver Burden-Mastery Hybrid Assessment Tool With Decision Matrix in a Memory Clinic: A Multimethod Study. SAGE Open Nurs. 2024 Dec 19;10:23779608241307002.







Project CHAT-MI (2018-2019) - Matrix



Lim ZX, et al. Psychometrics of the Pearlin Mastery Scale among Family Caregivers of Older Adults Who Require Assistance in Activities of Daily Living. Int J Environ Res Public Health. 2022 Apr 12;19(8):4639.

Lim ZX et al. Development and Validation of a Multidimensional Short Version Zarit Burden Interview (ZBI-9) for Caregivers of Persons With Cognitive Impairment. Alzheimer Dis Assoc Disord. 2023 Jan-Mar 01;37(1):59-65.

Chan EY, et al. Exploring the Feasibility of a Caregiver Burden-Mastery Hybrid Assessment Tool With Decision Matrix in a Memory Clinic: A Multimethod Study. SAGE Open Nurs. 2024 Dec 19;10:23779608241307002.







Project CHAT-MI (2018-2019) - Results

Opportunity to check-in on wellbeing

"(The) questionnaires helped me to reflect and introspect on areas where I need more support, and (think about) whether I've overlooked my own wellbeing"

- CG5, regarding screening questions

Guided clinicians in probing of caregiver issues

"(CHAT-MI) guides clinician to dig more [probe] when they score high on mastery and burden... Having (CHAT-MI) will guide the consultation process, and nurses will know how to intervene [provide recommendations for caregivers]. The consultation is more structured and systematic compared to before"

- HCP1, regarding usage of matrix

Provides ancillary insights on caregivers to guide consultation

"The tool is able to pick up that she [caregiver] is stressed, and the nurse gave suggestions for (referrals to) [caregivercentric programs] or [mindfulness programs]"

- HCP 5

"It would be good because you are able to identify high burden scores in a case [caregiver] that you don't expect"

- HCP 6

Lim ZX, et al. Psychometrics of the Pearlin Mastery Scale among Family Caregivers of Older Adults Who Require Assistance in Activities of Daily Living. Int J Environ Res Public Health. 2022 Apr 12;19(8):4639.

Lim ZX et al. Development and Validation of a Multidimensional Short Version Zarit Burden Interview (ZBI-9) for Caregivers of Persons With Cognitive Impairment. Alzheimer Dis Assoc Disord. 2023 Jan-Mar 01;37(1):59-65.

Chan EY, et al. Exploring the Feasibility of a Caregiver Burden-Mastery Hybrid Assessment Tool With Decision Matrix in a Memory Clinic: A Multimethod Study. SAGE Open Nurs. 2024 Dec 19;10:23779608241307002.







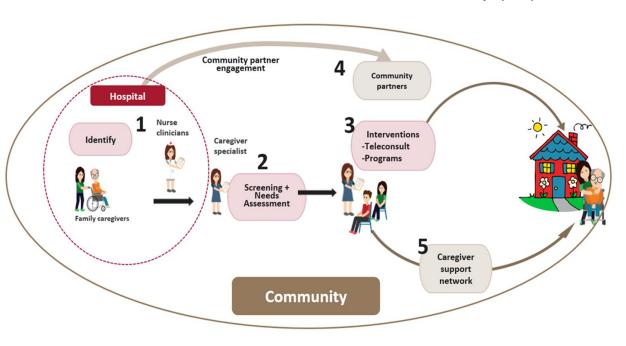
Project Carer Matters (2020-2022)

First hospital-to-home network in SG to screen, identify & provide targeted interventions for at-risk family caregivers

Introduced virtual support and engagement over COVID-19 pandemic, filling vital caregiver need over Circuit Breaker

Improved caregivers' knowledge, stress levels and confidence in care





Chan EY, Glass GF Jr. Delivering a holistic hospital-to-home framework to support family caregivers of persons with dementia: Protocol for a feasibility study. J Adv Nurs. 2022 May;78(5):1513-1523. Chan EY, et al. Applying the RE-AIM framework to evaluate a holistic caregiver-centric hospital-to-home programme: a feasibility study on Carer Matters. BMC Health Serv Res. 2022 Jul 19;22(1):933 Wu LT, et al. Developing a theory of change to guide the design and implementation of a caregiver-centric support service. BMC Health Serv Res. 2024 Dec 18;24(1):1620.





Project Carer Matters (2020-2022)

Training programmes delivered

Training Courses	Courses Description	
CARERS (Coaching, Advocacy, Respite, Education, Relationship, Simulation) Programme (Chiu et al., 2013)	cise in the presence of a simulated patient to practice the application of problem	
TEACH Programme	An interactive group course aims to build caregiving skills and provide emotional support for family caregivers. Sessions are tailored to central themes of caregiving (changing relationship, community resource navigation, future planning, self-care).	
Understanding Dementia	This course helps caregivers understand dementia, the nature of Behavioural and Psychological Symptoms of Dementia (BPSD) and general approaches to challenging behaviours.	
Problem-solving techniques	This course introduces a five-step problem-solving technique adapted from the CARERS programme. This is a group session tailored to help caregivers address practical problems faced (Chiu et al., 2013).	
Self-care techniques	This course will help caregivers recognise the importance of self-care and learn practical self-care tips.	
Caregiving Essentials	This group course will help caregivers understand more about caregiving and provide practical caregiving tips.	
Public forums/Seminars	Seminars are designed to provide generic sought-after information for caregivers, such as financial support availability and home safety.	

Sample resources

Caregiving **Activities**



Shopping, Housekeeping,



















Basic activities of daily living: Feeding, Bathing, Walking





Ensuring physical and mental well-being









Advocacy needs







What caregiver nowledge and skills do I need? Where can I find them?





How can I cope with the challenge: and demanding nature of caregiving?





How can I care for muself?





What are the available communiti resources? Where can I find them?







Project Carer Matters (2020-2022) – 2021 Pilot

Problem-solving support

"I let out whatever my problems, and (the caregiver support nurses) are able to listen and understand me, and sometimes give me some advice pertaining to that specific problem."

> CG18, regarding programmes attended (73F, caring for spouse with dementia)

Better-prepared for future needs

"It gives me (a better understanding) on what I can prepare for, what I can expect on the caregiving journey, and what kind of help I can receive."

- CG21, regarding programmes attended (46F, caring for mother with dementia)

Digitalization improved caregiver participation

"So it is kind of easy, it is good, this form. (Easy to) get it done."

- CG3, regarding online needs assessment form (62M, caring for mother with health problems)

Convenient to participate online

"It is not going to be long, it is Zoom... that means I can log in at home, I do not have to spend to (travel)."

> CG21, regarding programmes attended (46F, caring for mother with dementia)

550

Caregivers assessed for needs and provided tailored resources

69

Caregivers given telesupport

252

Caregivers attended in-house programs

Comparison of dementia knowledge before and after Understanding Dementia Virtual Course

Variables	Pre-test (n = 61) Mean (SD)	Post-test (n = 57) Mean (SD)	p-value
Total Score (Range 0-8)	5.39 (1.63)	6.81 (1.32)	<0.001

Mean Difference = 1.41 (95%CI: 0.87 - 1.96)







Supported over 800 caregivers and prototype evolved as part of BAU

Received: 15 December 2021 Revised: 31 January 2022 Accepted: 13 February 2022

DOI: 10.1111/jan.15210

PROTOCOL

Delivering a holistic hospital-to-home framework to sur family caregivers of persons with dementia: Protocol fo feasibility study

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Funding information

This study has been externally peerreviewed and awarded funding through the Geriatric Education and Research Institute (GERI) Intramural Project Grant (GERI Ref: GERI1626) awarded on 15 May

Aim: To evaluate the feasibility of the Carer Matters holistic hospital-t work for family caregivers of people with dementia.

Background: Family caregivers of persons with dementia face a u stressors, from behavioural management to navigating the healthca important to provide support and assistance to help caregivers cope t tained capacity for caregiving. This led to our establishment of Care first holistic caregiver-centric hospital-to-home framework of support of persons with dementia in Singapore.

Methods: A multimethod study design will be used. We will assess th feasibility and effectiveness using a Theory of Change approach, wit thesized using the Reach, Effectiveness, Adoption, Implementation an (RE-AIM) framework. Our study will involve six inpatient wards of a acute care hospital over 12 months. Qualitative data will be obtained f of stakeholders-caregivers, healthcare professionals, hospital leader nity leaders. Quantitative data will be collected from programme los evaluation forms that capture self-reported levels of mastery, anxiet depression. Funding has been approved by the Geriatric Education Institute (GERI) Intramural Project Grant (GERI Ref: GERI1626) on Ma study (£103,659), to be conducted from December 2020 to June 2021 Discussion: The stresses faced by caregivers of persons with dement complex, necessitating a multi-faceted caregiver-oriented solution t tained support, empower better management and continued capacit study would provide insights on the feasibility and effectiveness of a ca support programme stretching from the hospital into the community. Impact: These findings will provide a blueprint on how to implemen home patient-caregiver framework and provide policymakers, clinici cacy groups with critical insights on the potential patient-caregiver-hea outcomes that can be derived.

burden, caregiver, caregiving stress, continuity of patient care, dementia, feasi nursing, older person, screening tool, Singapore

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Chan et al. BMC Health Services Research (2022) 22:933 https://doi.org/10.1186/s12913-022-08317-3

BMC Health Services Research

RESEARCH

Applying the RE-AIM framework to evaluate a holistic caregiver-centric hospital-to-home programme: a feasibility study on Carer Matters

Ee Yuee Chan 12.3*, Ling Ting Wu¹, Emmalene Joo Yong Ng¹, George Frederick Glass Jr¹ and Robyn Hwee Teng Tan^{3,4}

Background: Prolonged caregiving of an older adult can cause family caregivers to be overwhelmed, potentially affecting the well-being of both the caregivers and their care-recipients. Carer Matters is a holistic hospital-to-home programme, centred on caregivers' needs as their care-recipients transit from hospital to home. The programme was piloted to support caregivers through caregivers needs assessment, tailored resources, tele-support, training courses. and community support network. This study aimed to examine the feasibility of Carer Matters in a tertiary hospital in

Methods: This feasibility study was conducted on the pilot implementation from January to December 2021, during the Covid-19 pandemic. It adopted the Reach, Effectiveness, Adoption, Implementation, and Maintenance (RE-AIM) framework. The study highlighted quantitative data collected from key process indicators, such as number of caregivers screened, assessed on their needs and provided with as sistance. Additionally, qualitative data was collected from in-depth interviews with 51 stakeholders involved in the implementation to examine their perspectives and experiences. These included family caregivers, clinician caregiver support nurses, hospital leaders and community partners.

Results: During the pilot, 550 caregivers were enrolled. All caregivers received educational resources when they completed the needs assessment, while 69 of them who reported high burden were given tele-support and 252 attended our caregiver training courses. Despite initial recruitment challenges and obstacles to adoption, stakeholders interviewed found Carer Matters to be effective in providing caregivers with emotional support, knowledge and skills that improved their caregiving abilities, and reduced their sense of isolation and caregiving stress. Among caregivers, the training courses were effective with majority of caregivers agreeing that the courses addressed their needs (99%) and improved their knowledge of the relevant disease conditions (97%). Programme maintenance considered among stakeholders included strategies such as multipronged approach in recruiting caregivers and inviting caregiver advocates to share their experiences.

Conclusion: This feasibility study highlights that Carer Matters is a valuable component to the ecosystem of support for family caregivers and their care recipients. Carer Matters extends the current patient-centric care model to a more holistic post-discharge continuity of care for both caregivers and their care-recipients, improving and maintaining their overall well-being to better allow transition from hospital-to home.

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mamily caregivers are the backbone of the healthcare system, often shouldering the bulk of long-term care. Furthermore, the increasing prevalence of chronic diseases is affecting the ability of our rapidly growing elderly population to perform activities of daily living independently.





Project Carer Matters 2 –

A seamless flow of support from hospital into society

Macrosystem Exosystem Mesosystem Microsystem Colleagues/ Caregiver **Employers** recipient Family members **Peers** Healthcare Extended Provider family **Emergency** Services Neighbours Social Service Volunteers **Partners** • Levels of impact in Cultural attitudes the ecosystem

Goal of PCM2

To strengthen the caregiving ecosystem and ensure the continuity of integrated care, which enables patient-caregiver dyads to age-in-place.

Thrust 1: Competent and Confident

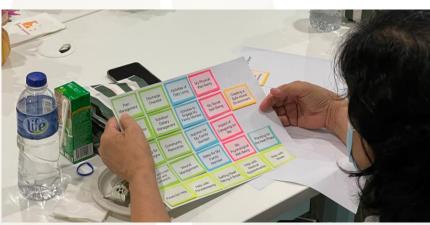
Thrust 2: Continue Care@Home

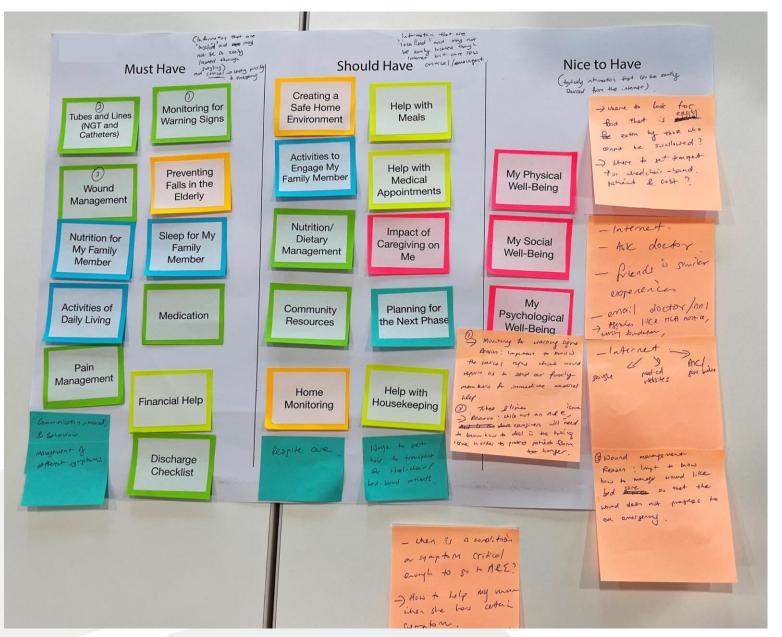
Thrust 3: Connected in Compassion









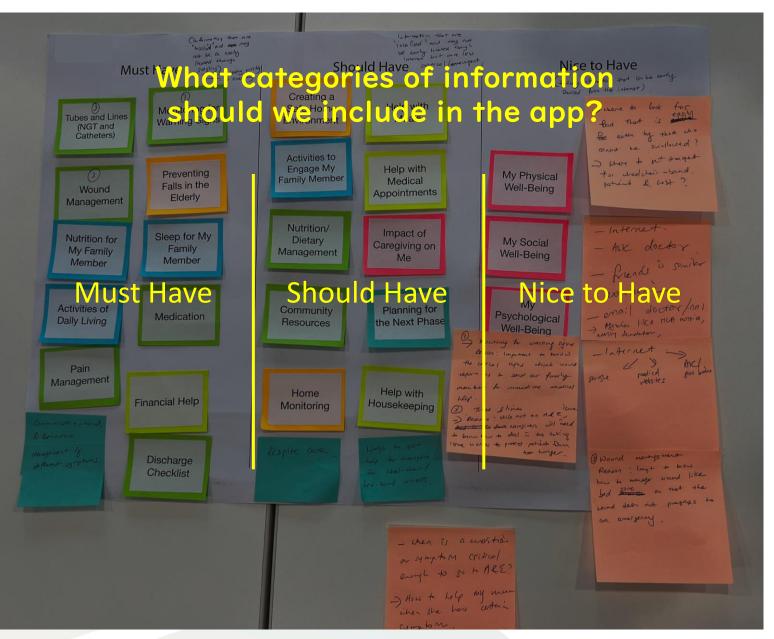
















Creating Prototypes through Iterative Cycles



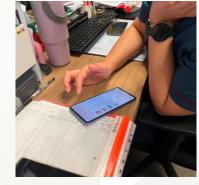












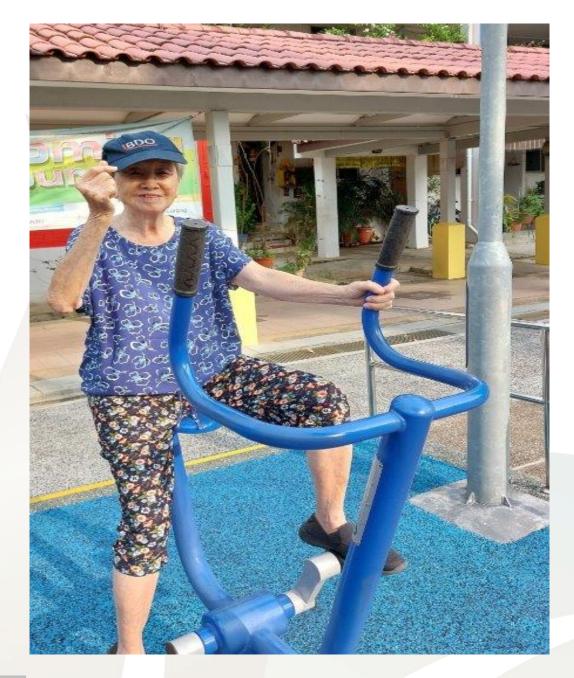












Conclusion

- Paradigm shift needed to not just focus on the aged patients, but also that of their families, to achieve ageing in place
- Better care for caregivers contributes to better care for seniors and healthier societies





Acknowledgements

We would like to thank our Co-Is, collaborators, caregivers, patients and fellow colleagues for their invaluable contributions along our journey





















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