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REVOLUTIONISING MEDICINE
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Blood Pressure Management amongst Older Adults at Community Nurse Posts in Singapore

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BACKGROUND

SingHealth Community Nursing Programme is a geography-based care model, comprising of Community Nurse Posts (CNPs) set up in the community to promote health, prevent illness, care for the ill and those at the end of life. The first CNP was set up in late 2017 and as of date, there are 68 CNPs in Eastern Singapore.

Fig 1. Community Nurse at CNP

Service provision includes 1) health and geriatric assessment, 2) health coaching for disease prevention, 3) chronic disease monitoring and self-management education, 4) medication self-management support and education and 5) care referral and coordination.

AIM

To investigate the effect on Blood Pressure (BP) in Singaporean older adults with hypertension, 3 months after Community Nurse-led interventions at SingHealth CNPs, and the extent to which diabetes mellitus (DM) influences that effect.

METHODOLOGY

Design | Single-group pretest-posttest study
Population | Generally ≥60 years old

Inclusion Criteria	Exclusion Criteria
a) Programme enrolment at any of 51 CNPs in the Southeast or East Singapore between 01 April and 31 December 2019 b) At least one hypertension-related problem during the first CNP visit	a) CNP clients with a SingHealth CNP visit before the study period

Pretest period | First CNP visit.
Post-test period | Three months after the first CNP visit.

Primary outcome | BP measurements during CNP visits between 01 April 2019 and 31 March 2020.

Statistical analysis | BP measurements were modelled using **linear generalized estimating equations**, adjusted for baseline age, gender, and race.

REFERENCES

(1) Verdecchia P, Gentile G, Angeli F, Mazzotta G, Mancia G, Reboldi G. Influence of blood pressure reduction on composite cardiovascular endpoints in clinical trials. *Journal of hypertension*. 2010 Jul 1;28(7):1356-65.
(2) Chan A, Malhotra R, Manap NB, Ting YY, Visaria A, Cheng GH-L, Goh VSM, Tay PKC, Lee JML, Maulod A. *THE SIGNS Study – I*. 2018. Singapore: Centre for Ageing Research and Education, Duke-NUS Medical School.

RESULTS

Out of 887 older adults (median age 72 years) at 51 CNPs, 595 had complete BP data. Baseline systolic and diastolic BP were 140.1 and 75.5mmHg respectively.

Population-average **reduction of 5.48mmHg** (95% confidence interval -6.99 to -3.96, P<0.001) **in systolic BP (SBP)** and **2.16mmHg** (-3.11 to -1.21, P<0.001) **in diastolic BP (DBP)**.

47% (odds ratio 0.53, 0.44 to 0.64, P<0.001) **reduction in odds of having suboptimal (≥140/90mmHg) blood pressure.**

Older adults without DM had a 3.92mmHg (0.88 to 6.95, P=0.011) **greater reduction in SBP** and a 2.24mmHg (0.37 to 4.11, P=0.019) **greater reduction in DBP**.

Similar results were observed for all 887 older adults after performing **multiple imputation by chained equations.** Also, even after **assuming a conservative null effect** for all missing data, there was still a 34% (OR 0.66, 0.58 to 0.75, P<0.001) reduction in the odds of having suboptimal blood pressure.

DISCUSSION

1. Clinical Significance of BP Reduction
BP reduction in older adults at SingHealth CNPs can potentially reduce cardiovascular risk. A 5mmHg reduction in SBP and a 2mmHg reduction in DBP reduces the risk of a cardiovascular event by 12% and 11% respectively[1]. It is possible that there was a similar magnitude of cardiovascular risk reduction in this cohort.

2. Effect of DM on BP Management
It is not surprising to see a lower reduction in SBP and DBP in older adults with DM, as DM increases arterial stiffness and makes it more challenging to reduce BP. Hence, it is vital that Community Nurses work closely with clients with DM in optimising their DM control.

3. Community Nurses' Role in BP Management
Community Nurses and clients work on mutual goal setting to define and achieve patient-identified goals. With active participation and control over decision-making to facilitate goal attainment, there was a 47% reduction in odds of having suboptimal blood pressure.

LIMITATIONS

- Causal inference remains elusive with a single-group pretest-posttest design. However, we have shown that the results are robust to assumptions of missingness. Also, as the baseline BP levels in this study were essentially identical to that in a nationally representative study[2], regression to the mean may not be a severe threat.
- There is insufficient analysis of the intervention intensity such as duration, frequency and content, can affect intervention outcomes. Also, the short period of study could not show if any behavioral change was sustained.

CONCLUSION

- SingHealth CNPs may be associated with improvements in BP, especially for those without DM.
- CNPs show a potential to improve chronic disease management amongst older adults through secondary and tertiary prevention.

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