Learning to Not Forget: Dementia Risk Awareness of Hypertensive Filipino Adults Residing in the Philippines - Study Protocol

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ABSTRACT

Background: Hypertension is a major contributor to cognitive decline, and dementia is an increasing public health concern in the Philippines. Despite evidence linking these conditions, the awareness of dementia risk remains limited. Broader modifiable factors—such as nutrition, physical activity, smoking, alcohol use and sleep—also influence dementia risk but are not consistently emphasized in health education for hypertensive adults.

Objective: To comprehensively assess the dementia risk awareness of hypertensive Filipino adults residing in the Philippines.

Methods: An adapted questionnaire will gather data on dementia risk awareness among hypertensive Filipino adults. Phase I involves distributing the questionnaire via Google Forms on social media and collecting informed consent, the Personal Data Sheet (PDS), Dementia Knowledge Assessment Scale (DKAS) responses and self-reported modifiable risk factors from the McCance Brain Care Score (BCS). Phase II consists of quantitative analysis using descriptive statistics, including sub-analyses assessing correlations between dementia risk awareness and secondary measures.

Expected Results: At least 384 responses from hypertensive Filipino adults are anticipated, allowing classification into dementia risk–aware or dementia risk–unaware groups using DKAS thresholds. Exploratory analyses will describe potential associations between dementia risk awareness and selected modifiable risk factors.

Keywords: Dementia risk awareness; dementia knowledge; hypertension; modifiable risk factors; Philippines

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INTRODUCTION

Hypertension is the most prevalent cardiovascular condition in the Philippines and a major contributor to premature mortality.[1,2] Dementia is likewise

an important public health concern affecting more than 726,000 Filipinos.[3] Chronic hypertension contributes to vascular and neurodegenerative processes associated with cognitive decline,[4,5] yet awareness of this relationship remains low in low- and middle-income countries, including the Philippines.[6]

Public understanding of broader modifiable dementia risk factors—such as nutrition, physical activity, smoking, alcohol use and sleep quality—also remains limited. These factors have been associated with cognitive outcomes across multiple populations,[7–9] but are seldom emphasized in health education directed at hypertensive adults.

Given these gaps in awareness, this study aims to assess dementia risk awareness of hypertensive Filipino adults using the Dementia Knowledge Assessment Scale (DKAS) and to explore associations between awareness levels and selected modifiable risk factors.

METHODS

Ethical Considerations

This study was reviewed and approved by the University of Santo Tomas Faculty of Medicine and Surgery Institutional Review Board (Approval No. UST: A002-40-LE01; REB Code: 2024-02-RAZALAN-DEMENTIA). It adheres to the principles of the Declaration of Helsinki, the Philippine National Ethical Guidelines for Health Research and the Data Privacy Act of 2012. Informed consent will be obtained electronically through the online questionnaire, and participation is voluntary and anonymous. No identifying information will be collected. Data will be stored in a secure, access-restricted institutional Google Drive folder accessible only to the research team. The study poses minimal risk, involving only completion of an online survey without any compensation.

Study Design

This is a descriptive, cross-sectional study that will assess dementia risk awareness among hypertensive Filipino adults using the DKAS. Data will be collected through a self-administered online questionnaire deployed via Google Forms and distributed through social media platforms.

Primary Outcomes

The primary outcome of the study is the prevalence of dementia risk awareness among hypertensive Filipino adults residing in the Philippines. Dementia risk awareness will be determined using the Dementia Knowledge Assessment Scale (DKAS) and reported as the proportion of participants classified as "dementia risk aware" (DKAS ≥75%) or "dementia risk unaware" (DKAS ≤74%).[10]

Secondary Outcomes

Secondary analyses will explore potential associations between dementia risk awareness and selected modifiable risk factors, including body mass index (BMI), nutrition, alcohol intake, smoking, aerobic activity and sleep. These analyses will use self-reported data from items derived from the Brain Care Score (BCS).

Participants

Eligible participants are hypertensive Filipino adults aged 18 years and older who reside in the Philippines, have access to social media and can read and comprehend English or Filipino. Because the study relies on a self-administered online questionnaire using the DKAS and selected BCS items, participants must possess sufficient functional health literacy to understand survey instructions and complete the instrument independently. Individuals with a clinical diagnosis of dementia or with inherited forms of dementia will be excluded. Hypertension will be defined as a prior clinical diagnosis or current use of antihypertensive medication.

Phase I

Data Gathering. A convenience sampling approach will be used to recruit participants through social media platforms. The online questionnaire will include an electronic informed consent form, Personal Data Sheet (PDS), the DKAS and self-reported modifiable risk factors based on selected BCS items.

Phase II

Data Analysis. Data will be analyzed using descriptive statistics to summarize demographic characteristics and DKAS scores. Exploratory analyses will examine associations between dementia risk awareness and modifiable risk factors using chi-square tests.

Setting

Data collection will be conducted entirely online through Facebook, Messenger, X and Instagram. Respondents may come from any region of the Philippines.

Instrument

The study will use the DKAS, a validated 25-item questionnaire measuring knowledge across four domains: causes and characteristics, communication and behavior, care considerations, and risks and health promotion. Items are answered using a five-point Likert scale. The original English version will be used. To support comprehension, the research team developed a brief Filipino-language primer placed before the questionnaire. A pilot test with a small convenience sample evaluated clarity and cultural relevance.

Selected items from the BCS were incorporated into the questionnaire to assess modifiable risk factors, including BMI, nutrition, alcohol intake, smoking, aerobic activity and sleep.

Sample Size Computation

A minimum of 384 participants was required, calculated using OpenEpi with a population size of 1,000,000 (recommended for large target populations), an anticipated frequency of 50%, 95% confidence level and 5% confidence limits. This sample size was sufficient for descriptive and exploratory analyses.

Statistical Analysis

Descriptive statistics will be used to summarize demographic characteristics and DKAS scores. Measures of central tendency and variability will be reported when appropriate. Chi-square tests will be conducted to explore associations between dementia risk awareness and selected modifiable risk factors.

Primary Endpoint

Frequency distributions will be described for variables such as region, family history of dementia, sex, age and intake of maintenance medications to ensure that baseline characteristics between hypertensive Filipinos who are "dementia risk aware" and "dementia risk unaware" are similar aside from the variables of interest.

Because this was a descriptive cross-sectional study, no statistical test was required for the primary study parameter. However, the measures of central tendency, such as mean, median and mode, as well as the measures of dispersion, variance and standard deviation, will be utilized to analyze the data gathered.

Secondary Endpoint

After analyzing the results from the DKAS, a sub-analysis shall be performed to explore possible relationships between the DKAS scores of participants and prevalence of modifiable dementia risk factors. These risk factors include body mass index (BMI), nutrition, alcohol intake, smoking, aerobic activities and sleep. Each of these will be treated as an exposure variable, while the outcome variable will be dementia risk awareness, as determined by the DKAS score (≥75% for "aware", ≤74% for "unaware"). These analyses will disaggregate the primary associations across demographic subgroups (eg, age, residence, or sex) to identify any disparities in dementia risk awareness patterns. Separate chi-squared tests will be performed to assess if there are differences in the dementia risk awareness of those with contrasting percentages of risk factor prevalence. While these findings may not necessarily be definitive, this would provide valuable baseline data, and possibly pinpoint key populations with specific risk factors in need of education.

EXPECTED RESULTS

We anticipate obtaining at least 384 valid responses from hypertensive Filipino adults. Participants will be classified as "dementia risk aware" or "dementia risk unaware" based on DKAS scoring thresholds. Descriptive statistics will summarize demographic characteristics and DKAS scores. Exploratory analyses will examine possible associations between dementia risk awareness and selected modifiable risk factors, including BMI, nutrition, alcohol intake, smoking, aerobic activity and sleep.

Individual Author's Contributions

MAJAR served as the Project Leader and provided overall oversight of the study, guided task allocation within the team, coordinated ethics submissions, supported recruitment activities, supervised data collection and data management procedures, contributed to the development of the analysis plan and participated in manuscript preparation. RAER served as the Liaison Officer and supported research ethics communications, assisted in recruitment, contributed to data collection and data management procedures and participated in manuscript writing. JBCR, FMLR, MLAUR, SZGR, AGLR and VCR contributed to participant recruitment, administration of the survey instrument, data gathering and assisted in manuscript preparation. IPA contributed to the conceptual development of the study, provided content expertise relevant to dementia awareness and risk factors, and critically reviewed the protocol. IMTL served as the Technical Adviser and contributed to the refinement of the study design and methods, and to critical revision of the protocol manuscript. RJRF developed the statistical analysis plan and provided a methodological review of the protocol. All authors reviewed and approved the final version of the manuscript.

Disclosure Statement

This paper did not receive any funding.

Conflicts of Interest

The authors declare no conflicts of interest.

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REFERENCES

1. Mills KT, Stefanescu A, He J. The global epidemiology of hypertension. *Nat Rev Nephrol* [Internet]. 2020;16(4):223–37. Available from: http://dx.doi.org/10.1038/s41581-019-0244-2
2. Ona DID, Jimeno CA, Jasul GV Jr, Bunyi MLE, Oliva R, Gonzalez-Santos LE, et al. Executive summary of the 2020 clinical practice guidelines for the management of hypertension in the Philippines. *J Clin Hypertens (Greenwich)* [Internet]. 2021;23(9):1637–50. Available from: http://dx.doi.org/10.1111/jch.14335
3. Dominguez J, Jiloca L, Fowler KC, De Guzman MF, Dominguez-Awao JK, Natividad B, et al. Dementia incidence, burden and cost of care: A Filipino community-based study. *Front Public Health* [Internet]. 2021;9:628700. Available from: http://dx.doi.org/10.3389/fpubh.2021.628700
4. Lee CJ, Lee J-Y, Han K, Kim DH, Cho H, Kim KJ, et al. Blood pressure levels and risks of dementia: A nationwide study of 4.5 million people. *Hypertension* [Internet]. 2022;79(1):218–29. Available from: http://dx.doi.org/10.1161/HYPERTENSIONAHA.121.17283
5. Ungvari Z, Toth P, Tarantini S, Prodan CI, Sorond F, Merkely B, et al. Hypertension-induced cognitive impairment: from pathophysiology to public health. *Nat Rev Nephrol* [Internet]. 2021;17(10):639–54. Available from: http://dx.doi.org/10.1038/s41581-021-00430-6
6. Hossain M, Crossland J, Stores R, Dewey A, Hakak Y. Awareness and understanding of dementia in South Asians: A synthesis of qualitative evidence. *Dementia* [Internet]. 2020;19(5):1441–73. Available from: http://dx.doi.org/10.1177/1471301218800641
7. Singh SD, Oreskovic T, Carr S, Papier K, Conroy M, Senff JR, et al. The predictive validity of a Brain Care Score for dementia and stroke: data from the UK Biobank cohort. *Front Neurol* [Internet]. 2023;14:1291020. Available from: http://dx.doi.org/10.3389/fneur.2023.1291020
8. Chen J-C, Espeland MA, Brunner RL, Lovato LC, Wallace RB, Leng X, et al. Sleep duration, cognitive decline, and dementia risk in older women. *Alzheimers Dement* [Internet]. 2016;12(1):21–33. Available from: http://dx.doi.org/10.1016/j.jalz.2015.03.004
9. Deal JA, Power MC, Palta P, Alonso A, Schneider ALC, Perryman K, et al. Relationship of cigarette smoking and time of quitting with incident dementia and cognitive decline. *J Am Geriatr Soc* [Internet]. 2020;68(2):337–45. Available from: http://dx.doi.org/10.1111/jgs.16228
10. Annear MJ, Toye C, Elliott K-EJ, McInerney F, Eccleston C, Robinson A. Dementia knowledge assessment scale (DKAS): confirmatory factor analysis and comparative subscale scores among an international cohort. *BMC Geriatr* [Internet]. 2017;17(1):168. Available from: http://dx.doi.org/10.1186/s12877-017-0552-y