Research Article

Health Awareness and Dementia Risk Among Older Adults with Hypertension and Diabetes: A Cross-sectional Study in Thailand

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Abstract

Background: Maintaining appropriate health awareness is essential for reducing the risk of dementia among older adults with chronic diseases.

Objectives: This cross-sectional study examined the relationship between personal factors, health awareness, and dementia in older adults with chronic conditions in Thailand.

Methods: This cross-sectional study was carried out from June to October 2024 in Thailand. The participants included community-dwelling older adults aged 60 years and above, who were diagnosed with hypertension and diabetes. Data collection was conducted using structured questionnaires, and statistical analyses were performed employing Pearson's correlation coefficient and multiple regression analysis.

Results: Participants exhibited strong awareness of the risks associated with complications and the severity of chronic diseases. However, their understanding of the benefits of health-promoting behaviors and the barriers to accessing care was moderate. Regression analysis identified perceived susceptibility to complications ($\beta = 0.15$, $P = 0.02$) and perceived disease severity ($\beta = 0.17$, $P = 0.01$) as significant predictors of cognitive function.

Conclusions: These findings suggest the importance of improving health awareness and promoting physical activity through targeted health education and community interventions to support cognitive health among older adults with chronic conditions. A key limitation of this study is its cross-sectional design and reliance on self-reported data, which may affect the accuracy of the findings. Future research should investigate health behaviors and daily lifestyle practices to develop targeted interventions for dementia prevention and health promotion among older adults with chronic diseases.

Keywords: Aged, Chronic Disease, Dementia, Mental Health

1. Background

Dementia has emerged as a critical global health concern, particularly affecting older adults. According to the World Health Organization (1), over 55.2 million individuals worldwide currently live with dementia, with approximately 10 million new cases diagnosed annually. Projections indicate that this figure will rise to 78 million by 2030 and 139 million by 2050, presenting profound challenges to healthcare systems and economies worldwide (1). The progression of dementia, characterized by the decline of cognitive functions, significantly impairs individuals' independence and quality of life (2).

In Asia, the rapid aging of the population has resulted in a notable rise in dementia prevalence (3). Countries such as China, Japan, and South Korea are confronting significant challenges due to the increasing prevalence of dementia among their aging populations (4). In China, the number of individuals with dementia was estimated at 9.2 million in 2010, with projections

indicating a substantial rise in the coming decades (3). Factors such as cultural norms, healthcare infrastructure, and varying levels of public awareness shape the approaches to dementia care across the region. For instance, family caregiving is often prioritized in Asian societies, offering substantial support but potentially leading to caregiver strain and adverse health outcomes for both caregivers and patients (4).

In Thailand, the proportion of individuals aged 60 years and older reached 20% of the total population by 2021 (5). Among this demographic, dementia prevalence ranges from 2% to 10%. However, effective dementia prevention and management are hindered by limited resources, insufficient public awareness, and fragmented healthcare services (6). Additionally, there is a lack of research specifically addressing the needs of older adults with chronic diseases, a group particularly susceptible to cognitive decline (7).

Health awareness plays a pivotal role in reducing the risk of dementia (4). It involves understanding health conditions, recognizing early warning signs, and adopting preventive measures (8). Evidence suggests that individuals who engage in regular health monitoring, maintain an understanding of chronic disease management, and participate in physical exercise are less likely to experience cognitive decline (9). Despite these findings, the level of health awareness among older adults remains inconsistent across different regions, underscoring the necessity for targeted and culturally sensitive interventions (10).

This study posits that enhanced health awareness contributes to improved management of chronic diseases and lowers the risk of dementia by promoting preventive practices and healthier lifestyles. Previous research supports the connection between health awareness and cognitive function, demonstrating that health perceptions play a significant role in influencing self-management behaviors and health outcomes (9). Chronic diseases, particularly diabetes and hypertension, pose considerable challenges for health management among older adults (11). Diabetes can lead to vascular damage, which may accelerate cognitive decline, while hypertension elevates the risk of cerebrovascular incidents, a critical factor in the onset of dementia (7).

While previous research has addressed dementia risk among older adults, few studies have explored the role of health awareness specifically among individuals with chronic diseases such as hypertension and diabetes in Thailand (12, 13).

2. Objectives

To fill this knowledge gap, this study aimed to assess the relationship between personal factors, health awareness, and cognitive function among older adults with hypertension and diabetes in Thailand. The findings aim to inform public health strategies, enhance preventive measures, and improve the quality of life for older adults. By identifying key modifiable factors, this study contributes to developing targeted interventions to reduce dementia risk and promote better health outcomes for this vulnerable population.

3. Methods

3.1. Study Design, Settings, and Sample

This study employed a cross-sectional research design, with data collection occurring from June to October 2024 at health-promoting hospitals located in the Kae Om sub-district of Amphawa district, Samut Songkhram province, Thailand. The study population comprised community-dwelling older adults aged 60 years and above, of any gender, who reside in the Kae Om sub-district and have been diagnosed with chronic conditions such as hypertension and diabetes by licensed medical professionals. Participants were included if they were 60 years or older, residents of the district, and able to communicate in Thai. Individuals unwilling to participate were excluded from the study. The sample size of 530 was established using Krejcie and Morgan's formula (14) to ensure adequate power for detecting significant relationships. Purposive sampling was used to recruit participants who were readily accessible at health-promoting hospitals and met the inclusion criteria. While this approach ensured relevant participation, it may limit the generalizability of findings beyond this population. Older adults completed the questionnaires independently, while trained researchers assisted those with limited literacy. Participants exhibiting severe cognitive impairment, as indicated by mini-mental state examination (MMSE) scores falling below the established threshold, were

excluded from the study. Of the initial 530 respondents, nine were excluded due to MMSE scores below education-adjusted thresholds, resulting in a final sample size of 521.

3.2. Research Instruments

3.2.1. Demographic Information

This section was developed by the authors and included 11 items capturing participants' age, gender, marital status, education level, occupation, smoking and alcohol consumption habits, chronic illnesses, family history of dementia, exercise habits, and exercise duration.

3.2.2. Perceived Health Awareness

The assessment questionnaire was specially designed for this study based on the conceptual framework of Brook et al. (15), incorporating four dimensions of health awareness: Perceived susceptibility to complications, perceived severity of disease, perceived benefits of health-promoting behaviors, and perceived barriers to health maintenance. It consisted of 30 items rated on a 3-point scale: One = disagree, 2 = partially agree, and 3 = strongly agree. Mean (M) scores were categorized as follows: 2.50 - 3.00 indicated a high level of health awareness, 1.50 - 2.49 denoted a moderate level of health awareness, and 1.00 - 1.49 represented a low level of health awareness. The assessment of content validity was conducted using the Content Validity Index (CVI). A panel comprising three experts in mental health and public health individually reviewed each item for relevance, clarity, and simplicity. Items that received a CVI of 0.92 or higher were included in the final version of the tool. The scale underwent pilot testing with 30 older adults from a different community. Reliability testing produced a Cronbach's alpha coefficient of 0.86, demonstrating good internal consistency in this study.

3.2.3. Cognitive Function

The MMSE-Thai version 2002 (MMSE-Thai 2002) (16) was utilized to evaluate cognitive function and comprises 11 items, with a maximum score of 30 points. The MMSE-Thai 2002 was selected for its reliability and cultural relevance. Permission to implement the MMSE-Thai 2002 was granted by the Institute of Geriatric Medicine. The cut-off points for cognitive impairment

were established as follows: A score of ≤ 22 for individuals with no formal education, ≤ 24 for those with primary education, and ≤ 26 for individuals with education beyond primary school. Participants who did not meet these thresholds were excluded from the analysis to ensure the reliability of the responses. The tool demonstrated a Cronbach's alpha of 0.92. While the MMSE is widely used, it does not evaluate executive function, which may hinder the early detection of cognitive decline, particularly in populations with diabetes and hypertension involved in this study.

3.3. Data Collection

Data were collected by a research team consisting of trained professionals and supervised students. Before data collection, participants were briefed about the study's objectives and procedures. Structured questionnaires were administered, and responses were recorded confidentially. Completing the questionnaire took approximately 15 to 30 minutes.

3.4. Data Analysis

The data were analyzed utilizing SPSS Version 23 software. Descriptive statistics, such as the mean and standard deviation (SD), were employed to summarize the data. Pearson's product-moment correlation coefficient was used to explore the relationships between variables, while multiple regression analysis was performed to identify potential predictors. Assumptions for multiple regression — linearity, multicollinearity, homoscedasticity, and normality — were tested. No violations were observed, and variance inflation factors were within acceptable limits (< 2). Cases with missing data were listwise deleted from the analysis. Missingness was < 5% and deemed random. A P-value of less than 0.05 was considered statistically significant.

3.5. Ethical Considerations

The study received approval from the Human Research Ethics Committee at the Institute for Research and Development, Suan Sunandha Rajabhat University (COA.1-020/2024), on May 16, 2024. Participants were informed about the study's objectives, the data collection procedures, potential benefits, and associated risks. They were guaranteed their right to participate voluntarily or withdraw at any time without facing any

Table 1. General Characteristics of the Participants [a]

Characteristics	Values
Gender	
Female	320 (62.50)
Male	192 (37.50)
Age (y)	
60 - 65	78 (15.23)
66 - 70	254 (49.61)
> 71	180 (35.16)
Marital status	
Single	9 (1.76)
Married	224 (43.75)
Divorced	159 (31.05)
Widowed	120 (23.44)
Education level	
No formal education	54 (10.55)
Primary school	325 (63.48)
High school	133 (25.97)
Occupation	
Unemployed	293 (57.23)
Government employee	68 (13.28)
General contractor	30 (5.86)
Farmer/agriculture	106 (20.70)
Trade/private business	11 (2.15)
Other	4 (0.78)
Smoking history	
Non-smoke	327 (63.87)
Smoker	185 (36.13)
Alcohol consumption history	
No alcohol consumption	340 (66.41)
Alcohol consumption	172 (33.59)
Exercise history	
No exercise	290 (56.64)
Regular exercise	222 (43.36)
Chronic diseases history	
HTN	243 (47.46)
DM	119 (23.24)
Both HTN and DM	150 (29.30)
Duration of exercise (min)	
< 30	158 (30.86)
31 - 40	50 (9.77)
41 - 50	14 (2.73)
> 50	0 (0.00)
No exercise	290 (56.64)
Family history of dementia	
No	275 (53.71)
Yes	237 (46.29)

Abbreviations: HTN, hypertension; DM, diabetes mellitus.

[a] Values are expressed as No. (%).

consequences. Confidentiality was upheld throughout the study, and the data collected were utilized exclusively for academic purposes and presented in aggregate form.

4. Results

The study included 512 participants with an mean age of 68.2 ± 5.6 years. The majority of participants were female (62.5%) and aged between 66 and 70 years (49.61%). In terms of marital status, 43.75% reported being married. Regarding educational attainment, the largest group had completed primary education (63.48%). More than half of the participants were not employed (57.23%). Additionally, a significant portion of the sample identified as non-smokers (63.87%) and abstained from alcohol consumption (66.41%). An

Table 2. Perceived Health Awareness of Participants

PHA	M (Dimensions)	SD	M (Item)	Interpretation
Perceived risk of complications	12.85	3.52	2.96	High level
Perceived severity of disease	22.56	5.86	2.85	High level
Perceived benefits	20.58	4.98	2.45	Moderate level
Perceived barriers to health care	21.55	5.12	2.16	Moderate level
Perceived overall health status	78.96	18.56	2.57	High level

Abbreviations: PHA, perceived health awareness; M, mean; SD, standard deviation.

Table 3. Correlation Between Individual Factors and Cognitive Function Among Older Adults with Chronic Diseases

Characteristics	Cognitive Function	
	Pearson Correlation (R)	P-Value
Gender|	0.152	0.004 [a]
Age	-0.049	0.347
Marital status	-0.154	0.245
Educational level	0.089	0.087
Occupation	0.046	0.382
Smoking	0.041	0.435
Alcohol consumption	0.009	0.870
Presence of chronic diseases	0.036	0.492
Physical activity	-0.054	0.303
Duration of physical activity	0.142	0.006 [a]
Family history of dementia	0.038	0.471

[a] $P < 0.05$ indicates statistical significance.

overview of participants' demographic characteristics can be found in Table 1.

4.1. Perceived Health Awareness

Overall, the participants displayed a strong level of health awareness. When examined across specific dimensions, the findings indicated that participants were particularly knowledgeable about the risks of complications and the severity of diseases. However, regarding the perceived benefits of health-promoting behaviors and the barriers to health maintenance, their awareness was only moderate. These results are detailed in Table 2, offering a comprehensive overview of the different aspects of health awareness within the study population.

4.2. Cognitive Function Assessment

The study evaluated cognitive function levels among older adults with chronic diseases. The majority of participants achieved MMSE scores above the cutoff,

suggesting intact cognitive function across education levels. The M scores ranged from 26.78 to 27.81, reflecting normal cognitive status.

4.3. Factors Associated with Cognitive Function in Older Adults with Chronic Diseases

The analysis identified significant associations between various individual factors and cognitive function among older adults with chronic diseases. Notably, gender exhibited a weak yet statistically significant positive correlation with cognitive function ($R = 0.15$, $P = 0.004$). Furthermore, the duration of physical activity also revealed a weak but statistically significant positive correlation ($R = 0.14$, $P = 0.006$). These findings are summarized in Table 3.

4.4. Health Perception and Cognitive Function

Only perceived susceptibility to complications ($\beta = 0.15$, $P = 0.02$) and perceived disease severity ($\beta = 0.17$, $P = 0.01$) were statistically significant predictors. The model

Table 4. Multiple Regression Analysis of Health Perception Factors Influencing Cognitive Function [a]

Health Perception Factors	Unstandardized Coefficients		Standardized Coefficients (β)	t	P-Value
	B	SE			
Constant	25.156	1.641	-	19.32	0.00
Perceived susceptibility to complications	0.75	0.25	0.15	2.42	0.02 [b]
Perceived severity of disease	0.89	0.42	0.17	2.15	0.01 [b]
Perceived benefits of health behavior	1.45	0.29	0.32	3.01	0.78
Perceived barriers to health maintenance	1.56	0.32	0.27	2.89	0.89

[a] $R^2 = 0.148$, adjusted $R^2 = 0.189$, F = 3.125.
[b] $P < 0.05$.

explained 18.9% of the variance in cognitive function ($R^2 = 0.148$, adjusted $R^2 = 0.189$), with an F-statistic of 3.125 supporting its validity. Other variables were retained in the model but did not reach significance (Table 4).

5. Discussion

These results align with studies conducted in Thailand, which identified similar demographic patterns, particularly the higher proportion of female older adults aged 71 and above with lower educational attainment and hypertension as the predominant chronic illness (17). Further support for these findings showed that females aged 70 and older are at greater risk of experiencing age-related cognitive decline, highlighting that advancing age is a significant risk factor for dementia (18).

The study found that perceived susceptibility to complications and perceived disease severity influenced cognitive function outcomes. These results align with Sangsrijan et al. (19), who reported that health perception significantly predicts health stability in individuals with chronic diseases. Older adults with chronic illnesses who possess a clear understanding of their health conditions and the potential complications arising from inadequate self-care are better equipped to mitigate further health deterioration (11). Appropriate self-management among older adults with chronic conditions, therefore, plays a crucial role in reducing the risk of dementia (20).

This is further supported by Leibing and Schicktanz (21), who emphasized the importance of utilizing digital health systems for chronic disease and dementia care. These systems facilitate continuous care, especially for individuals with limited mobility, by providing accessible, ongoing health monitoring and support (22). Similarly, Kjær Pedersen and Tanggaard (23) examined the interactions of family caregivers with the Danish healthcare system while caring for relatives with dementia. It emphasized the vital role of caregivers in managing chronic diseases, highlighting that their knowledge, preparedness, and appropriate care behaviors are crucial for providing quality care (23).

The study indicated that participants across various educational backgrounds — ranging from no formal education to elementary and beyond — exhibited normal cognitive function. These findings highlight the significance of health awareness in mitigating the risk of dementia. Additionally, factors such as divorce and lower educational attainment were linked to reduced health management capabilities, which may further contribute to cognitive decline. Chronic conditions, including hypertension and diabetes, emerged as notable contributors to dementia risk due to their effects on vascular and metabolic health (11). This contrasts with previous research that reported higher rates of dementia among individuals with uncontrolled hypertension (24). Those findings suggest that uncontrolled hypertension heightens the risk of dementia in older adulthood, while effective management could alleviate this risk (24).

Similarly, Thongwachira et al. (25) highlighted that preventing dementia requires controlling modifiable risk factors, such as cardiovascular health, adopting brain-healthy diets, avoiding harmful substances, engaging in regular physical and cognitive activities, and managing stress effectively. A study conducted in Iran highlighted the importance of cognitive stimulation and social activity participation for

maintaining brain function. This aligns with the current study's findings, which indicate that participants who refrain from smoking and alcohol consumption show a reduced risk of developing dementia (26).

Saipanya (27) proposed that community-based dementia prevention programs should incorporate activities that promote health and cognitive engagement among older adults, especially those with mild cognitive impairment. Strategies such as providing occupational support, enhancing self-sufficiency in daily activities, and encouraging participation in social engagements have proven effective in reducing the risk of dementia (28). This study identified gender and the duration of physical activity as significant factors influencing cognitive function in older adults with chronic diseases. These results align with the research conducted by Sukchan et al. (13), which identified gender, marital status, and health-related behaviors — such as exercise duration — as critical predictors of cognitive function. Similarly, Surawan (12) highlighted that gender and physical activity are essential factors affecting cognitive health in older adults.

Furthermore, Islam et al. (29) provided additional evidence that gender, smoking, alcohol consumption, and the use of various medications — including sleeping aids, lipid-lowering drugs, anticoagulants, and antihypertensive medications — are significantly associated with dementia risk. These findings should be interpreted in light of the rural Thai healthcare context, where limited access to preventive services, fragmented care delivery, and lower levels of health literacy among older adults may hinder early detection and management of cognitive decline. Such systemic barriers highlight the need for culturally tailored and accessible health promotion interventions.

Although the regression model yielded statistically significant predictors, it accounted for only a modest proportion of the variance in cognitive function ($R^2 = 14.8\%$). This suggests that additional unmeasured factors — such as social support, comorbidities, medication use, or environmental influences — may also play an important role and warrant further investigation.

5.1. Conclusions

This study highlights the role of perceived health awareness (PHA) — specifically perceived susceptibility

to complications and disease severity — as significant predictors of cognitive function among older adults with chronic diseases in rural Thailand. The findings emphasize the importance of promoting physical activity, enhancing health education, and implementing culturally tailored community-based interventions aimed at reducing dementia risk in this vulnerable population. Given the modest explanatory power of the regression model, future research should incorporate broader cognitive assessments — including tools that evaluate executive function—and consider a wider range of influencing factors such as medication use, mental health status, and social support. Additionally, efforts to improve inclusivity by incorporating individuals with varying levels of cognitive impairment and extending research to other geographic regions are crucial. Moving forward, validating culturally adapted tools like the MoCA-Thai and examining the long-term impact of health awareness interventions through longitudinal studies will be essential for guiding effective dementia prevention strategies in aging populations.

5.2. Implications for Practice and Research

The findings from this study underscore the importance of promoting health awareness as a preventive strategy for dementia among older adults with chronic diseases. In practical terms, community-based health education campaigns should be developed and implemented to target this population, with a focus on increasing understanding of cognitive health and the management of conditions such as hypertension and diabetes. In rural areas, where healthcare resources are often limited, the use of accessible digital platforms — such as LINE messaging applications or mobile health units — can enhance outreach efforts and support health promotion activities. Additionally, interventions should be culturally and linguistically tailored to improve health literacy and encourage health-promoting behaviors in older adults.

From a research perspective, future studies should focus on validating culturally adapted cognitive assessment tools, such as the Thai version of the Montreal Cognitive Assessment (MoCA-Thai), to ensure sensitivity to early cognitive decline, particularly in relation to executive function. Longitudinal research is also needed to evaluate the long-term effects of health awareness interventions on cognitive outcomes.

Furthermore, the development and testing of gender-sensitive and rural-targeted intervention models are recommended to address the distinct health needs and disparities faced by older adults in under-resourced communities.

5.3. Limitations

This study has several limitations. First, its cross-sectional design precludes causal inferences regarding the relationship between health perceptions, physical activity, and cognitive function. Second, reliance on self-reported data may introduce recall and social desirability biases. Third, the exclusion of participants with MMSE scores below the education-adjusted threshold may have introduced healthy participant bias, thereby limiting the representativeness of individuals with more severe cognitive impairment. This may result in an underestimation of dementia risk in the broader population. Additionally, the MMSE primarily assesses general cognitive function and lacks sensitivity to executive dysfunction, which is particularly relevant in individuals with hypertension and diabetes. The study also did not control for potential confounding factors such as medication use, mental health conditions, or environmental influences. Moreover, the geographic concentration of participants in a single rural province restricts the generalizability of the findings. Future studies should address these limitations by including more diverse populations, incorporating objective health measures, and using more comprehensive cognitive assessments.

Footnotes

Authors' Contribution: Conceptualization: J. O., R. D., and A. T.; Methodology: J. O. and R. D.; Software: J. O. and A. T.; Validation: J. O. and R. D.; Formal analysis: J. O. and R. D.; Writing-original draft preparation: J. O. and R. D.; Writing-review and editing: J. O., R. D., and A. T.; All authors have read and agreed to the published version of the manuscript.

Conflict of Interests Statement: The authors declare no conflict of interest.

Data Availability: The dataset presented in the study is available on request from the corresponding author

during submission or after publication. Data were anonymized to protect the privacy of the participants.

Ethical Approval: The study received approval from the Human Research Ethics Committee at the Institute for Research and Development, Suan Sunandha Rajabhat University (COA.1-020/2024), on May 16, 2024.

Funding/Support: The present study received no funding/support.

Informed Consent: Written informed consent was obtained from the participants.

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