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Self-awareness of Health Conditions and Service Utilization among People with Diabetes Mellitus, Hypertension, and Chronic Obstructive Pulmonary Disease in Thailand, 2019

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Abstract

This study aims to assess the self-reported prevalence of three common non-communicable diseases (NCDs), namely diabetes mellitus (DM), hypertension (HTN) and chronic obstructive pulmonary disease (COPD), determine the proportion of Thai residents with these diseases who utilize health services, and explore factors associated with service utilization. We used data from Thailand's Health and Welfare Survey 2019. We describe the characteristics of those who utilized services and explore factors associated with service utilization using a logistic regression. The prevalence of DM, HTN and COPD among individuals aged at least 15 years was 5.8%, 11.0% and 0.2%, respectively. A high prevalence of these NCDs was observed among older people, those with low education, rural residents, and the unemployed. Those in the richest quintile reported utilizing less services than the poorest. We found associations between having two comorbidities (adjusted odds ratio (AOR) 1.30, 95% confidence interval (CI) 1.12–1.50), living in the northeast (AOR 1.31, 95% CI 1.12–1.53) and being unemployed (AOR 1.22, 95% CI 1.05–1.42) with increased the utilization. The findings highlight the importance of screening services to minimize undiagnosed NCDs, and increase awareness among underserved populations. Provision of awareness campaigns and health education related to NCDs are urgently needed.

Keywords: health service utilization, non-communicable diseases, Thailand

Introduction

Non-communicable diseases (NCDs) are the leading cause of death and disability, contributing to 41 million deaths, which is more than 70% of all deaths worldwide.[1] Approximately one-third of deaths due to NCDs occur among those aged 30–69 years and 85% of these premature deaths occur in low- and middle-income countries. Furthermore, NCDs impose a major and growing burden on health and economic development in the Southeast Asia Region.[2] At the individual level, NCDs cause early death and, among survivors, severe disability. Individuals can be trapped into poverty due to lost productivity and catastrophic health expenditure. For governments, NCDs undermine economic progressiveness and stifle development.[3] Therefore, it is imperative to address this emerging catastrophe for the sake of preventing premature deaths and disability, improve individual well-being, a prosperous economy, and global health security.[4,5] Early detection, screening, and timely treatment are key components to reducing the impacts of NCDs.

To ensure that all individuals and communities receive the health services they need without financial hardship, Universal Health Coverage (UHC) is adopted by many countries, including Thailand. Thailand achieved UHC in 2002 when the entire population was covered by one

of the three public health insurance schemes.[6] The Civil Servant Medical Benefit Scheme (CSMBS) provides health insurance to government officials, their dependents (e.g., parents, spouses, and children) and retirees.[7] The Social Security Scheme (SSS) is a compulsory health insurance program for private-sector employees and government employees. The remaining population are covered by the Universal Coverage Scheme (UCS). The majority of Thai people are covered by UCS (76%), followed by SSS (17%) and the Civil Servant Medical Benefit Scheme (7%).[6]

Mediating factors that affect access to health care are an individual's ability to perceive health care needs, which is shaped by health literacy and education. Health care seeking and utilization capacity have been shown to be associated with age, region, occupation, health insurance, socio-demographic and socio-economic attributes.[8,9]

The 2019 Health and Welfare Survey (HWS) is a nationally representative household survey conducted by the National Statistical Office (NSO). The first survey was undertaken in 1974 and subsequently conducted every other year. The 2019 HWS was the 21st round; data were collected from 27,960 sampled households located in urban and rural areas of every province in March 2019.[10] The survey contained information on health insurance, illness, provisions for health services, and household assets that captures aspects of household health and economic welfare rather than the money metric.[11]

There are limited studies exploring factors (including socio-economic attributes) associated with health services utilization among people with NCDs in Thailand. It is important, in the realm of UHC provisioning in Thailand, to identify the socioeconomic barriers to health service utilization. The aims of this study were: (a) to determine the self-reported prevalence of three common NCDs, namely diabetes mellitus (DM), hypertension (HTN), and chronic obstructive pulmonary disease (COPD), which are the leading causes of premature death in Thailand, (b) to determine the self-report proportion of the population with NCDs who utilize health services, and (c) to determine factors associated with health service utilization, including receiving treatment from a public or private health facility, visiting a local or traditional carer, and self-medication.[12]

Methods

Study Design and Data Source

This study employed a cross-sectional design. We obtained secondary data from the 2019 HWS. The HWS uses a stratified two-stage sampling technique. The primary stage is enumeration area (EA), an area comprising a set of households. From 127,460 EA covering the whole country, 1,990 EA were randomly sampled. The secondary stage is at the household level. From 1,990 EA samples, 16 households per urban EA (defined as being within a municipality) and 12 households per rural EA (outside a municipality) were randomly sampled. All members of the sampled households were interviewed. Finally, the HWS collected data from 27,960 households and 63,594 individuals.[10] In this study, people less than 15 years old were excluded. A total of 52,921 people were obtained.

Data Collection

All participants were asked about the presence of any underlying diseases, which were confirmed by a physician or healthcare worker. The standard question was: "Do you have any underlying diseases?". Those who answered in the affirmative were asked two further questions, the first being: "What is/are the underlying disease(s) that you were diagnosed with by a physician or healthcare worker?". Respondents could indicate up to five diseases. The second question was: "During the last month, did you receive any health services for your underlying disease(s)?". Respondents who answered in the affirmative were also asked to state the number of times they received health services.

Data Analysis

The prevalence of DM, HTN and COPD and prevalence of health service utilization were calculated based on sampling weights to represent the entire Thai population.[10] The NSO provided these weights according to the probability of each individual being randomly selected. We also calculated an asset index using principal component analysis based on questions on the possessions of durable and semi-durable goods and housing characteristics.[10] The asset index was further categorized into five groups based on quintiles. The first quintile was the poorest group, whereas the fifth quintile represented the richest group.

All variables were presented as a weighted proportion and univariate analysis with chi-square statistic was applied. We used logistic regression to identify associations between the dependent and independent variables among those with at least one of the selected NCDs. The independent variables consisted of number of comorbidities in the three selected NCDs, gender, age group, region of residence (central including Bangkok, north, northeast and south), area of residence (urban or rural), education level (up to primary education, secondary education, and bachelor's degree or above), occupation, health insurance and asset index quintile. The dependent variable was self-reported health service utilization within a month before the survey.

All variables were analysed univariately. Independent variables that had a *p*-value of less than 0.1 in the univariable analysis were included in the initial multivariable model. The findings were presented in terms of the prevalence odds ratio with 95% confidence interval (CI). A *p*-value <0.05 was considered significant. All analyses were performed using STATA version 16.

Results

Prevalence of Self-reported DM, HTN and COPD

The prevalence of self-reported DM, HTN and COPD was 5.8%, 11.0% and 0.2%, respectively. Females had a significantly higher prevalence of self-reported DM and HTN (7.3% and 13.0%, respectively), while males had a higher prevalence of COPD (0.2%). The prevalence of HTN and COPD was significantly greater in the northern region (15.3% and 0.3%, respectively) compared to other regions, and for DM, the prevalence was higher in the north-eastern region (6.9%). The prevalence of COPD among urban and rural residents was similar (*p*-value 0.92). However, for DM and HTN, the prevalence was significantly higher for rural residents (6.0% and 11.1%, respectively). Those having up to primary education had nearly a four times higher prevalence of DM, HTN and COPD (10.0%, 18.6% and 0.3%, respectively) than people with a higher education. Members insured with the SSS had the lowest prevalence compared with members of the other two insurance schemes. Those in the richest quintile had the lowest prevalence of DM and COPD than the poorer quintiles, while those in the third quintile had the lowest prevalence of HTN (Table 1).

Table 1. Prevalence of self-reported diabetes mellitus (DM), hypertension (HTN), and chronic obstructive pulmonary diseases (COPD) among the adult (age ≥15 years) in Thailand Health and Welfare Survey, 2019.

Variable	Sample size (n)	Weighted prevalence (%)					
		DM	*P*-value*	HTN	*P*-value*	COPD	*P*-value*
Gender							
Male	24,759	4.2	<0.001	8.9	<0.001	0.2	<0.001
Female	28,162	7.3		13.0		0.1	
Age group (years)							
15–29	9,318	0.2	<0.001	0.2	<0.001	0.0	<0.001
30–39	7,576	0.7		1.0		0.0	
40–49	10,073	2.8		4.2		0.0	
50–59	11,110	7.6		14.0		0.2	
60–69	8,544	15.6		29.5		0.2	
70+	6,300	20.7		43.3		0.9	
Region							
Central	18,480	5.3	<0.001	11.1	<0.001	0.2	<0.001
North	11,368	6.5		15.3		0.3	
Northeast	14,016	6.9		9.1		0.1	
South	9,057	4.4		9.2		0.1	
Area							
Urban	29,700	5.6	<0.001	11.0	<0.001	0.2	0.928
Rural	23,221	6.0		11.1		0.2	
Education							
Up to primary	28,863	10.0	<0.001	18.6	<0.001	0.3	<0.001
Up to secondary	17,641	2.1		4.2		0.1	
Bachelor's degree or above	6,289	2.5		5.1		0.0	
Occupation							
Self-employed	21,683	5.6	<0.001	10.0	<0.001	0.1	<0.001
Employed	14,489	1.9		3.9		0.3	
Unemployed	16,729	10.2		20.0		0.1	
Health insurance							
SSS	5,742	1.6	<0.001	3.7	<0.001	0.1	<0.001
CSMBS	5,058	9.6		19.2		0.2	
UCS	42,121	6.3		11.8		0.2	
Asset index quintile							
Quintile 1	10,429	5.5	<0.001	11.2	<0.001	0.2	<0.001
Quintile 2	10,806	5.8		11.1		0.2	
Quintile 3	11,157	6.0		9.9		0.1	
Quintile 4	11,210	6.7		12.0		0.1	
Quintile 5	9,319	5.1		11.0		0.1	

**Chi-square test. SSS: Social Security Scheme, CSMBS: Civil Servant Medical Benefit Scheme, UCS: Universal Coverage Scheme*

Proportion of Health Service Utilization among People with DM, HTN and COPD

The proportion of health services utilization among those with DM, HTN and COPD was 60.9%, 56.8% and 51.9%, respectively. As shown in Table 2, among those with DM, males had a higher utilization (61.4%) than females (60.8%). For COPD, health services utilization was 48.2% among males and 67.0% among females. Among DM and HTN, those aged 30–39 years had the lowest utilization (53.4% and 27.8%, respectively) whereas for COPD, those aged younger than 30 years had the lowest utilization (0.0%). Residents of the north-eastern region had a higher utilization than the other regions and rural residents had a higher utilization than urban residents. Among DM and COPD, those with a bachelor's degree or above had higher health service utilization. However, for HTN, those with up to primary education had the highest utilization. Those with DM and HTN who were members of the UCS had the highest proportion of utilization (63.2% and 58.3%, respectively). For COPD, members insured by the SSS had the highest utilization (94.8%). Among those with DM, HTN and COPD, the richest quintile had the lowest health service utilization (54.0%, 53.7% and 32.8%, respectively).

Table 2. Proportion of health service utilization within one month among diabetes mellitus (DM), hypertension (HTN), and chronic obstructive pulmonary diseases (COPD) adult (age ≥15 years) in Thailand Health and Welfare Survey, 2019

Variables	Weighted proportion of health service utilization (%)					
	DM	*P*-value	HTN	*P*-value	COPD	*P*-value
Gender						
Male	61.4	<0.001	56.9	0.191	48.2	<0.001
Female	60.8		56.8		67.0	
Age group (years)						
15–29	65.6	<0.001	83.8	<0.001	0.0	<0.001
30–39	53.4		27.8		100.0	
40–49	60.7		54.6		69.3	
50–59	61.0		56.7		50.0	
60–69	60.4		56.7		69.7	
70+	62.1		58.3		47.7	
Region						
Central	59.6	<0.001	55.5	<0.001	53.7	<0.001
North	56.1		55.2		46.6	
Northeast	66.2		63.3		82.3	
South	59.4		52.6		39.8	
Area						
Urban	59.6	<0.001	55.2	<0.001	48.8	<0.001
Rural	62.1		58.2		56.4	
Education						
Up to primary	61.5	<0.001	57.5	<0.001	50.8	<0.001
Up to secondary	57.2		54.5		54.5	
Bachelor's degree or above	63.4		54.4		100.0	
Occupation						
Self-employed	58.6	<0.001	56.2	<0.001	32.4	<0.001
Employed	57.1		51.2		85.8	
Unemployed	63.4		58.3		55.9	
Health insurance						
SSS	46.1	<0.001	53.1	<0.001	94.8	<0.001
CSMBS	50.9		48.1		55.6	
UCS	63.2		58.3		49.6	
Asset index quintile						
Quintile 1	62.8	<0.001	58.1	<0.001	42.9	<0.001
Quintile 2	63.8		59.4		65.9	
Quintile 3	62.8		56.8		69.7	
Quintile 4	60.9		56.2		55.4	
Quintile 5	54.0		53.7		32.8	

SSS: Social Security Scheme, CSMBS: Civil Servant Medical Benefit Scheme, UCS: Universal Coverage Scheme

Factors Associated with Health Service Utilization

On multivariable analysis there was a significant association between having multiple comorbidities and health service utilization. Those with two comorbidities were 1.30 times (95% CI 1.12–1.50) more likely to utilize health services than those with a single underlying disease. There was also a significant association between living in the north-eastern region and utilization. Patients in the north-eastern region were 1.31 times (95% CI 1.12–1.53) more likely to utilize health services than participants in the central region. Being unemployed also had a significant association with utilization. Unemployed residents had 1.22 times (95% CI 1.05–1.42) higher utilization than the self-employed (Table 3).

Table 3. Factors associated with health service utilization within one month among diabetes mellitus (DM), hypertension (HTN), and chronic obstructive pulmonary diseases (COPD) adult (age ≥15 years) in Thailand Health and Welfare Survey, 2019

Characteristics	Crude POR* (95% CI)	*P*-value	Adjusted POR* (95% CI)	*P*-value
Number of underlying diseases (DM, HTN, COPD) (n=8,887)				
Having 1/3 diseases	Reference			
Having 2/3 diseases	1.34 (1.16–1.54)	<0.001	1.30 (1.12–1.50)	<0.001
Having all diseases	2.78 (0.28–27.85)	0.384	2.92 (0.25–33.48)	0.390
Gender (n=13,221)				
Male	0.94 (0.85–1.04)	0.021	1.07 (0.94–1.21)	0.295
Female	Reference			
Age group (years) (n=13,221)				
15–29	Reference			
30–39	1.48 (0.98–2.24)	0.064	0.41 (0.13–1.36)	0.145
40–49	1.95 (1.37–2.79)	<0.001	0.73 (0.24–2.16)	0.565
50–59	2.41 (1.72–3.38)	<0.001	0.78 (0.26–2.29)	0.648
60–69	2.50 (1.79–3.50)	<0.001	0.71 (0.24–2.11)	0.542
70+	2.70 (1.93–3.78)	<0.001	0.74 (0.25–2.18)	0.582
Region (n=13,221)				
Central	Reference			
North	1.04 (0.92–1.18)	0.521	0.94 (0.81–1.10)	0.438
Northeast	1.29 (1.14–1.46)	<0.001	1.31 (1.12–1.53)	0.001
South	0.98 (0.85–1.14)	0.827	0.92 (0.76–1.11)	0.389
Area of residence (n=13,221)				
Urban area	Reference			
Rural area	1.12 (1.02-1.24)	0.023	1.06 (0.94–1.20)	0.339
Education (n=13,211)				
Up to primary	1.25 (1.03–1.53)	0.027	0.89 (0.67–1.19)	0.429
Up to secondary	0.96 (0.77–1.22)	0.761	0.95 (0.70–1.29)	0.748
Bachelor's degree or above	Reference			
Occupation (n=13,217)				
Self-employed	Reference			
Employed	0.77 (0.65–0.91)	0.002	0.97 (0.77–1.23)	0.814
Unemployed	1.15 (1.03–1.27)	0.009	1.22 (1.05–1.42)	0.008
Health insurance (n=13,221)				
SSS	Reference			
CSMBS	1.22 (0.93–1.60)	0.149	0.77 (0.53–1.13)	0.184
UC	1.58 (1.24–2.01)	<0.001	1.18 (0.84–1.68)	0.342
Asset index quintile (n=13,221)				
Quintile 1	1.28 (1.09–1.50)	0.002	1.08 (0.86–1.35)	0.526
Quintile 2	1.30 (1.11–1.52)	0.001	1.13 (0.90–1.40)	0.288
Quintile 3	1.14 (0.97–1.33)	0.103	1.06 (0.86–1.33)	0.536
Quintile 4	1.20 (1.02–1.42)	0.027	1.08 (0.88–1.33)	0.469
Quintile 5	Reference			

**Prevalence odds ratio (POR) was calculated based on sampling weight.*

SSS: Social Security Scheme, CSMBS: Civil Servant Medical Benefit Scheme, UCS: Universal Coverage Scheme

Discussion

The self-reported prevalence of DM, HTN and COPD was 5.8%, 11.0% and 0.2%, respectively, while the prevalence based on the Thai National Health Examination Survey VI (NHES) that was conducted during 2019–20 was 9.5%, 25.4% and 0.4%, respectively.[13] The prevalence of most diseases from the NHES was higher than that of the HWS because the NHES included undiagnosed groups by comprehensive and accurate medical examinations. However, the prevalence of COPD was still low in both surveys. This was likely due to the fact that COPD was self-reported in both surveys. A high prevalence of undiagnosed and untreated NCDs demonstrates the inadequacy of current NCD diagnosis and management strategies.[14] Moreover, the self-reported measures reflect people's awareness and likely lowers the propensity of under-reporting.[15]

The overall prevalence of health service utilization among those with DM, HTN and COPD was 60.9%, 56.8% and 51.9%, respectively. A study in Tanzania reported that the prevalence of service utilization among those with HTN was 34% during the previous 12-month interval.[16] However, the difference might be due to differences in the questionnaire used.

Those with a lower education had a higher prevalence of DM, HTN and COPD than those with a higher education, a result consistent with other studies. In Japan, lower education level was associated with higher incidence of DM among both men and women, and with HTN only women.[17] In Argentina, adults with higher educational attainment lived healthier and longer lives compared with their less educated peers.[18]

The proportion of respondents utilizing health services was lower among those in the working age. We found the lowest proportion in the 30–39 age group. Formal workers have regular working hours. Moreover, for receiving health services, some workers lost income due to their inability to work. Informal workers may not seek treatment for life-threatening heart conditions.[19] A previous study found that the working age should be considered as a risk-prone group due to their lower access to health services and less use of these services for medical screening.[20]

We found that those in the richest wealth quintile had a lower utilization of health services than those in the poorer quintiles. Studies have shown that poor people tend to have less access to health services than the rich.[21] However, another study in Thailand found that less affluent people had greater health care needs and received more services than the more affluent groups.[7] Possible explanations are that poor people with NCDs tend to have worse outcomes than their richer counterparts.[22] Consequently, they might be more likely to seek health services. We found that the prevalence of DM and COPD was lowest in the richest quintile.

We found a significant association between living in the northeast and health service utilization. Residents in the northeast had a 1.28 times higher utilization than those in the central region. Those living in Bangkok and surrounding areas tend to utilize services less due to time barriers and high medical expenses.[23] A survey by the NSO found that Bangkok had the highest proportion of non-registered population (33.4%).[24] The non-registered population face difficulties in health service utilization as they need to pay upfront when using health facilities to which they were not registered.[25]

Our study showed a significant association between comorbidities and health service utilization. Patients with two comorbidities were 1.31 times more likely to utilize health services than those with single underlying disease. The previous study found that increasing comorbidities was associated with a higher odds of diagnosing HTN, a higher odds of having treatment for HTN, and a higher odds of uncontrolled HTN which led to an increase in health service utilization.[26]

Being unemployed was significantly associated with health service utilization. Unemployed participants had a higher health service utilization than those who were self-employed (adjusted odds ratio 1.22, 95% CI 1.05–1.42). A study from the National Institute for Occupational Safety and Health found that the unemployed were more likely to report adverse health outcomes than the self-employed. The prevalence of chronic health conditions increased from the short-term unemployed to the long-term unemployed.[27]

Limitations

There are some limitations of this study which should be mentioned. First, we classified study participants based on their self-reporting status of a previous diagnosis. Therefore, our finding is prone to recall bias. Second, some of the data were also incomplete. Thus, statistical power might be limited when focusing on certain variables. Third, interviewers from the HWS asked the participants if they had received any health services for their underlying diseases within a month of interview and we classified the outcome variable according to their response. Those who utilize health services less frequently may have been misclassified into the non-utilization group.

Conclusion and Recommendations

The self-reported prevalence of three common non-communicable diseases was lower than the examination-based prevalence. The prevalence of NCDs was higher among those aged 60 years or more, having a low education, living in a rural area and being unemployed. The proportion of health service utilization among those with diabetes mellitus and hypertension was lower in the working-age group. Those in the highest income quintile had a lower proportion of health service utilization compared with the other quintiles. A significant association was seen between multiple comorbidities, living in the northeast region and being unemployed with increased health service utilization.

The findings of the study highlight the importance of screening for NCDs, especially in high risk groups such as the elderly, those with a low education level, living in a rural area and the unemployed. Health education and awareness campaigns related to NCDs should be given to underserved populations. There is need for non-registered populations in Bangkok to increase their health service utilization by improving the primary care unit and facilitating the various registration channels. Based on the study findings, future research may entail assessment of the factors contributing to the regional variations in health service utilization and identifying effective support policies for improving utilization throughout the country. However, for an accurate evaluation of health services utilization, the NSO should add more questions asking participants about health service utilization, adherence to treatment and their underlying health status.

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