Drug-related Problems in Elderly People with Non-communicable Chronic Diseases in Sinsamut Community, Pathumthani Province, Thailand

นิพนธ์ต้นฉบับ

Original Article

อนุภาพ ปิติรัตนวรนาท[1]* และ พัชญา คชศิริพงศ์[2]

[1] หมวดวิชาเภสัชกรรมปฏิบัติเพาะทาง คณะเภสัชศาสตร์ มหาวิทยาลัยรังสิต

[2] หมวดวิชาเภสัชกรรมปฏิบัติทั่วไป คณะเภสัชศาสตร์ มหาวิทยาลัยรังสิต

* **ติดต่อผู้นิพนธ์:** benzanuphap@gmail.com

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Anuphap Pitiratanaworanat[1]* and Patchaya Kochsiripong[2]

[1] Department of Specialty Pharmacy Practice, Faculty of Pharmacy, Rangsit University, Thailand

[2] Department of General Pharmacy Practice, Faculty of Pharmacy, Rangsit University, Thailand

* **Corresponding author:** benzanuphap@gmail.com

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บทคัดย่อ

วัตถุประสงค์: เพื่อศึกษาปัญหาจากการใช้ยาของผู้สูงอายุที่มีโรคไม่ติดต่อเรื้อรังในชุมชนสินสมุทร อ.ธัญบุรี จ.ปทุมธานี รวมถึงสาเหตุของปัญหา **วิธีการศึกษา:** การวิจัยเชิงพรรณนาภาคตัดขวางโดยเก็บข้อมูลในผู้ที่มีอายุตั้งแต่ 60 ปีขึ้นไปและมีโรคไม่ติดต่อเรื้อรังอย่างน้อย 1 โรคระหว่างเดือนสิงหาคมถึงธันวาคม 2560 แบบเก็บข้อมูลประกอบด้วยข้อมูลทั่วไป เครื่องมือเวชศาสตร์ครอบครัว INHOMESSS และแบบบันทึกปัญหาจากการใช้ยาตามแนวทางของ The Pharmaceutical Care Network Europe (PCNE) version 7.0 **ผลการศึกษา:** ตัวอย่างผู้สูงอายุ 39 ราย ส่วนใหญ่เป็นเพศหญิง (ร้อยละ 64.10) อายุเฉลี่ย 70.8 ปี จบชั้นประถมศึกษา (ร้อยละ 61.54) ได้รับรายได้จากบุตรหลาน/ญาติพี่น้องและเบี้ยยังชีพ รายได้เฉลี่ยต่อเดือนต่ำกว่า 5,000 บาท (ร้อยละ 61.54) ใช้สิทธิประกันสุขภาพถ้วนหน้า (ร้อยละ 84.62) ส่วนใหญ่มีโรคประจำตัวคือโรคความดันโลหิตสูง (ร้อยละ 97.44) ตามด้วยโรคไขมันในเลือดสูง (ร้อยละ 56.41) และเบาหวาน (ร้อยละ 43.59) ปัญหาที่พบมากที่สุดจากเครื่องมือ INHOMESSS คือด้าน Nutrition (ร้อยละ 24.56) รองลงมาคือ Examination (ร้อยละ 21.93) และ Medication (ร้อยละ18.42) ปัญหาจากการใช้ยาตามแนวทาง PCNE V7.0 ที่พบบ่อยที่สุด คือ การได้รับยาที่ไม่จำเป็นหรือไม่มีข้อบ่งใช้ (ร้อยละ 61.90) รองลงมา คือผู้ป่วยมีโรคหรืออาการที่ยังไม่ได้รับการรักษา (ร้อยละ 19.05) สาเหตุของปัญหาที่พบมากที่สุด คือการลืมใช้ยา (ร้อยละ 36.17) รองลงมา คือการใช้ยาที่ไม่จำเป็น (ร้อยละ 27.66) และการเก็บรักษายาไม่เหมาะสม (ร้อยละ 17.02) **สรุป:** การเยี่ยมบ้านทำให้ทราบปัญหาของคนไข้ที่ใกล้ความจริง ควรสร้างความตระหนักรู้ถึงการควบคุมอาหาร การควบคุมน้ำหนัก และความจำเป็นในการรับประทานยาอย่างสม่ำเสมอ รวมทั้งควรมีการส่งเสริมและผลักดันบทบาทของเภสัชกรครอบครัวให้มากขึ้น

คำสำคัญ: ปัญหาจากการใช้ยา, INHOMESSS, PCNE V7.0, ผู้สูงอายุ, โรคไม่ติดต่อเรื้อรัง, เภสัชกรครอบครัว

Abstract

Objective: To identify types of drug related problems (DRPs) and their causes in elderly people with non-communicable chronic disease (NCD) in Sinsamut community, Thanyaburi, Pathumthani province. **Method:** In this cross-sectional descriptive research, data were collected from the elderly aged 60 years or older with at least one NCD during August to December 2017. We collected general characteristics, problems based on INHOMESSS home visit guide and DRPs and causes by the Pharmaceutical Care Network Europe guideline (PCNE) version 7.0 DRP identification guide. **Result:** In 39 participating elderly individuals, the majority were female (64.10%), with an average age of 70.8 years and graduated with primary school diploma (61.54%). Their income was mostly from their children or relatives and subsistence allowance with the income of less than 5,000 Baht per month in 61.54% of participants. Their health insurance mostly was universal coverage (84.62%). The most common chronic diseases were hypertension (97.44%), dyslipidemia (56.41%), diabetes (43.59%) and cardiovascular diseases (41.03%). The most detected problems by INHOMESSS family medicine tool were Nutrition (24.56%) followed by Examination (21.93%) and Medication (18.42%). The most prevalent DRP from the PCNE V7.0 were unnecessary drug treatment (61.90%) followed by untreated indication (19.05%). The most found causes of DRP were forgetting to take medication (36.17%) followed by using unnecessary drugs (27.66%) and inappropriate drug storage (17.02%). **Conclusion:** Home visits allowed for more reliable information. Awareness on diet control, weight control and the necessity of drug compliance should be raised. Home care services provided by family pharmacists should be promoted.

Keywords: Drug related problem, INHOMESSS, PCNE V7.0, elderly person, non-communicable chronic disease, family pharmacist

Introduction

Non-communicable diseases (NCDs) are chronic illnesses including hypertension, cardiovascular disease, asthma, chronic obstructive pulmonary disease, diabetes, cancers, etc. As suggested by the name, NCDs are not caused by any micro-organisms, but often caused by inappropriate behaviors such as a lack of exercise, smoking and excessive consumption of sugar, alcohol, and salt. NCDs are also associated with stress. The World Health Organization (WHO) recognized that NCDs have become more burdensome as they accounted for 38 million deaths annually. NCD-related deaths increased from 60% of all deaths in 2000 to 68% in 2012. In addition, there were more than 16 million people prematurely died with NCDs in the age less than 70. To handle the increasing trend of NCD related mortality, WHO has encouraged all countries worldwide to recognize the problem of NCDs and has set up joint agreements with member states to target and track the progress of these diseases since 2012.[1,2]

Thailand has also been experiencing a dramatic increase in NCDs, as seen with the rising absolute number of NCD related deaths and proportion of such death in relation to overall mortality rate. A study reported that the number of deaths from NCDs increased from 314,340 in 2009 to 349,090 in 2013, indicating an average increase of NCD related deaths of 8,687.5 cases per year. The public health statistics A.D. 2015, conducted by the Bureau of Policy and Strategy, Ministry of Public Health, showed that the most common NCDs were cardiovascular diseases, followed by the endocrine disorders.[3] NCDs were more common in the elderly who have several comorbidities with the concomitant use of many drugs. As a result, drug related problems (DRPs) in the elderly are common. These DRPs include improper drug storage, incorrect drug administration, drug-drug interactions, drug-herb/dietary supplement interactions, adverse drug reactions and side effects from the drugs.[4] With such urgency of the problem, Faculty of Pharmacy, Rangsit University (RSU), has established a family pharmacy unit to promote primary health care in communities surrounding the campus. This unit has been under the support of the RSU Health Campus campaign of the Rangsit University Development Project, and a financial support from the Thai Health Promotion Foundation (ThaiHealth).

Family pharmacy is a new primary care concept rendering pharmaceutical care service to the patients and their families by means of home visits to take care of the continuous medication use. The home visit process enables the pharmacist to understand the patient's actual problems in each of all dimensions including physical, mental, social and spiritual. The process also encourages the mutual agreement on problem-solving plan between pharmacists and patients. Problem-solving solutions on issues regarding medications and other health products both at family and community levels could be facilitated by this home visit.[5] Home visits by multidisciplinary team use a family-oriented tool called INHOMESSS consisting of nine elements of healthcare evaluation. First, I (Immobility) is the evaluation of the patient's movement and ability to perform daily activities. Second, N (Nutrition) evaluates the patient's nutritional status focusing on the relationship between food intakes and diseases. Third, H (Housing) is the evaluation of the environment and hygiene of the patient's residence. Forth, O (Other people) is the assessment of the patient's family members, family relationships and patient care. Fifth, M (Medication) evaluates all treatment modalities the patient has been using. These include conventional and traditional medicine, and complementary medicine such dietary supplements and herbs. Sixth, E (Examination) is the evaluation of the patient's general health such as blood pressure measurement and blood glucose control sugar test) as outcomes of medical treatment. Seventh, S (Safety) evaluates the patient's safety regarding home, environment and medication use. Eight, S (Spiritual health) is the assessment of the patient's attitudes, beliefs and mental states. Ninth, S (Service) is the evaluation of the patient's ability to access healthcare service. In this present study, the categories of INHOMESSS were based on the study of Papapae and colleagues.[6]

Assessing DRPs has been long known and three 3 assessment tools have been used. First, the Hepler and Strand's concept guided the classification of commonly used medication problems in the United States. Later, this concept was further developed as a guideline for the American Society of Health System Pharmacist (ASHP). The third guideline was the Pharmaceutical Care Network Europe (PCNE) Classification for drug related problems V7.0, which was developed by a pharmaceutical care research group in Europe. In this study, we used the PCNE V7.0 guideline because it is comprehensive, clear, and easy-to-use and has been used in many studies.[7,8] The PCNE V7.0 guideline consists of five categories namely Problem (P), Causes (C), Planned Interventions (I), Intervention Acceptance (A), and Outcomes (O). In this study, only two types of information, specifically Problem and Cause, were used, to better serve the purpose of home visits by pharmacists.[7] The Problem (P) in this study was composed of three problem aspects of including treatment effectiveness (unnecessary drug treatment and drug treatment with no indication), adverse drug events, and patient dissatisfaction on the therapy despite optimal clinical and economic outcomes.

In this study, we emphasized only causes of the problem originated from the patients themselves because other causes could not be readily assessed. The Causes (C) studied in this study therefore included forgetting to use drugs, using unnecessary drugs, food-drug interactions, inappropriate drug storage, wrong drug administration, poor drug accessibility, drug abuse and drug non-adherence.

The study of the causes and problems of medication use by pharmacists' home care visit aimed at finding, solving, and preventing problems related to the medication use in the

patient's actual residence. The findings from this study could have informed healthcare providers and settings about the problems and their causes which could lead to a policy change to promote home healthcare service. Specifically, this study aimed to identify drug related problems and causes of the problems in Sinsamut community, Thanyaburi district, Pathumthani province, and to determine health behaviors of community-dwelling patients using the INHOMESSS family medicine tool.

Methods

In this cross-sectional descriptive study, all elderly people in the Sinsamut community with at least 1 chronic disease who met the inclusion criteria were included. The study was conducted between August and December, 2017. The inclusion criteria were Thai elderly person, who were 60 years of age or older, residing in Sinsamut community between August and December 2017, having diagnosed with at least one NCD, and willingness to participate in the study. In terms of exclusion criteria, they were having physical or mental problems at the level to be obstacle to communication, and having communication impairment.

This research was approved by the Ethical Committee of Research Institute of Rangsit University (No. RSEC 04/2560, date of approval: June 1, 2017- May 31, 2018.

Home visits were managed by pharmacy instructors and pharmacy students of Rangsit University, and registered nurses and public health volunteers of Thanyaburi district. The visits were scheduled 2 - 3 times per week.

This process consisted of patient interview and observation of about 30 - 60 minutes. The recorded form was modified from the information of the National Health Security Office and literature review. The form was composed of 3 parts namely demographic data (such as gender, age, marital status, etc), INHOMESSS family medicine tool, and the Pharmaceutical Care Network Europe guideline (PCNE) version 7.0 DRP identification guide for Problem (P) and Cause (C) of drug related problems.

Statistical analysis

Results were presented by descriptive statistics including frequency with percentage and mean with standard deviation as appropriate.

Results

Upon completion, 39 elderly individuals with at least 1 NCD participated in the study (Table 1). Almost two-thirds of the participants were female (64.10%) and graduated with primary school degree (61.54%). Their average age was 70.8 years. All participants were Buddhist. Sources of income were mostly from their child or relatives and the government-provided subsistence allowance. Majority of the participants had an average income of less than 5,000 bath per month (61.54%). Their health insurance mostly was the universal coverage (84.62%) (Table 1).

Table 1 Demographic characteristics of the participants (N = 39).

Demographic characteristics		Number	%
Gender	Female	25	64.10
	Male	14	35.90
Age (yrs)	60 – 69	21	53.83
(mean = 70.8 yrs)	70 – 79	12	30.77
	80 – 89	5	12.82
	90 – 99	1	2.56
Marital status	Divorced / widowed	19	48.72
	Married / live together	18	46.15
	Separated	1	2.56
	Single	1	2.56
Education Level	Lower than primary school	7	17.95
	Primary school	24	61.54
	Junior high school / Vocational certificate	4	10.26
	Senior high school / High vocational certificate	1	2.56
	Bachelor's degree	2	5.13
	Others	1	2.56
Previous occupation	Merchant / Personal business	11	28.21
	General contractor / Freelance	10	25.64
	Private business employee	6	15.38
	Government official / Government employee	6	15.38
	Others	6	15.38
Source of income (more than one answer could be chosen)	Lineage / Relatives	22	56.41
	Subsistence allowance	22	56.41
	Merchant / Personal business	7	17.95
	Pension	6	15.38
	General contractor/Freelance	3	7.69
Average monthly income (Baht)	< 5,000	24	61.54
	5,000 – 10,000	10	25.64
	> 10,000	5	12.82
Health insurance payment scheme	Universal coverage scheme	33	84.62
	Civil servant medical benefit scheme	3	7.69
	Social security scheme	2	5.13
	Government enterprise officer benefit scheme	1	2.56

According to health and consumption behaviors, most participants did not smoke (69.23%) and did not consume alcoholic beverage (87.18%). However, 35.90% of them drank caffeinated beverage regularly and 38.46% drank sweet beverage occasionally. It was found that 25.64% of the participants preferred bland food to others. More than half exercised regularly (56.41%) and had 6 - 8 hours of sleep per day (51.28%) (Table 2).

Table 2 Health and consumption behaviors of the participants (N = 39).

Health and consumption behaviors		Number	%
Smoking behavior	Non-smoking	27	69.23
	Smoking	7	17.95
	Quit smoking	5	12.82
Alcoholic beverage consumption	None	34	87.18
	Occasional	4	10.26
	Regular	1	2.56
Caffeinated beverage consumption	None	18	46.15
	Occasional	7	17.95
	Regular	14	35.90
Sweet beverage consumption	No	21	53.85
	Occasional	15	38.46
	Regular	3	7.69
Favorite taste	Bland	10	25.64
	Sour	8	20.51
	Salty	7	17.95
	Sweet	6	15.38
	Spicy	5	12.82
	Others	3	7.69
Exercise	No	17	43.59
	Yes	22	56.41
Number of sleeping hours	< 4	1	2.56
	4 – 6	7	17.95
	6 – 8	20	51.28
	> 8	11	28.21

The most common NCDs were hypertension (97.44%), followed by dyslipidemia (56.41%), diabetes (43.59%) and cardiovascular diseases (41.03%). In terms of co-morbidity, the majority had two diseases (33.33%), and 28.21% had three diseases. More than one-third of the participants (35.90%) had a body mass index of 25 kg/m^2 or higher. Among patients with diabetes mellitus or renal disorders, more than half (56.25%) could not control their blood pressure level of less than 140/90 mmHg; while 78.26% of their counterparts had a well-controlled blood pressure. In addition, most participants had no drug allergy (Table 3).

The results form INHOMESSS family medicine investigation revealed that 114 problems were discovered. The most detected problems were the Nutrition aspect (24.56%). The participants were knowledgeable about proper nutrition but did not practice nutrition control accordingly (17.54%) and 7.02% of them had no disease-specific nutrition control knowledge. The second most found was the Examination aspect (21.93%) where 11.40% had common health problems while 10.53% had disease-specific illnesses. The third most found problems were the Medication aspect (18.42%) where most of them used herbs, alternative medicines or food supplements (7.89%) and 2.63% of them faced a lack of care continuity (2.63%) (Table 4).

Table 3 Health status of the participants (N = 39).

Health status	Number	%
Recent illness		
Hypertension	38	97.44
Dyslipidemia	22	56.41
Diabetes mellitus	17	43.59
Cardiovascular disease	16	41.03
Renal disease	5	12.82
Asthma/COPD	2	5.13
Gout	2	5.13
Cerebrovascular disease	1	2.56
Others	2	5.13
Number of diseases		
1	6	15.38
2	13	33.33
3	11	28.21
4	6	15.38
5	2	5.13
6	1	2.56
Body Mass Index (kg/m^2)		
< 18.49	6	15.38
18.5 – 22.99	13	33.33
23.00– 24.99	6	15.38
> 25	14	35.90
Goal of blood pressure level		
≥ 60 years (<150/90 mm Hg)	23	58.97
No	5	21.74
Achieved	18	78.26
With DM or renal disorders (<140/90 mmHg)	16	41.03
No	9	56.25
Achieved	7	43.75
History of drug allergy		
No	37	94.87
Yes	2	5.13

Table 4 Patient assessment by INHOMESSS family medicine tool (N = 39).

Problems		Number	%
Immobility	Limited activities of daily living	8	7.02
	Limited vision for reading prescription	4	3.51
	Limited ability to remove medications from package or to split tablet	1	0.87
Nutrition	Knowledgeable about disease-specific nutrition, but not controlled	20	17.54
	Not knowledgeable about disease-specific nutrition	8	7.02
Housing	Hygiene and environment unsafe and inappropriate for elderly	10	8.77
Other people	Lack of caregiver	1	0.88
	Caregiver not aware of and understanding the care	3	2.63
Medication	Uses food supplements	9	7.89
	Uses herbs or alternative medicines	9	7.89
	Lack of care continuity	3	2.63
Examination	Disease-specific health problems	12	10.53
	Common health problems	13	11.40
Spirituality	Stress/anxiety	9	7.90
Service	Limited access to service	4	3.51

The assessment of drug related problems (DRPs) upon the PCNE V7.0 guideline revealed 21 problems. The most prevalent DRP were unnecessary drug treatment (61.90%), which were caused by borrowing drugs from their neighbors and taking herbs or medicines by themselves without prescription or dispensed by pharmacists. The second most DRP was untreated indication (19.05%). There were problems about adverse drug event occurring and dissatisfaction with

their therapy despite optimal clinical and economic treatment outcomes (9.52% each). Moreover, we found that there were some elderly people who took antihypertensive drugs but could not control their blood pressure and some diabetic patients were dissatisfied with their blood glucose level (Table 5). The most common causes of DRP were forgetting to take medicines (36.17%) followed by using unnecessary drugs (27.66%) and inappropriate drug storage (17.02%) (Table 6).

Table 5 Assessment of drug related problems by PCNE V7.0 (N = 39).

Primary domains	Problems	Number	%
Treatment effectiveness	Unnecessary drug-treatment	13	61.90
	Untreated indication	4	19.05
Adverse events	Adverse drug event occurring	2	9.52
Others	Patient felt dissatisfied with therapy despite optimal clinical and economic treatment outcomes	2	9.52

Table 6 Causes of drug related problems by PCNE V7.0 (N = 39).

Major cause (Primary domains)	Minor causes	Number	%
Patient related	Patient forgot to use/take drug	17	36.17
	Patient used unnecessary drug	13	27.66
	Patient took food that interacts with drugs	1	2.13
	Patient stored drug inappropriately	8	17.02
	Patient administered the drug in a wrong way	3	6.38
	Patient unable to use drug as directed	5	10.64

Discussions and Conclusion

This study aimed to identify types of drug related problems (DRPs) and their causes and to determine health behaviors by INHOMESSS family medicine tool in elderly people with non-communicable chronic diseases. The results showed that most subjects were female, age between 60 - 69 years with average age 70.8 years and graduated with primary school diploma. More than half of the participants had an average income of less than 5,000 Baht per month, which mostly provided by their children or relatives and the government subsistence allowance. Most participants were taken care of by the universal coverage health insurance. These demographic data were consistent with other studies.[6,9,10]

For health and consumption behaviors aspect, the most common chronic diseases were hypertension followed by dyslipidemia, diabetes mellitus and cardiovascular diseases, respectively. Most of elderly people had more than one chronic disease and had their body mass index of more than 25 kg/m^2. Consequently, weight control, nutrition assessment and suitable exercise should be urgently promoted. Among patients who had diabetes mellitus or renal disorders, they could not control their blood pressure to be less than 140/90 mmHg. Meanwhile, those who did not have these disorders could achieve their blood pressure goal of <150/90 mmHg. Therefore, there should be home care visits by multidisciplinary team in order to make the holistic approach especially in patients with diabetes mellitus and/or renal disorders.

The results from INHOMESSS family medicine tool indicated that Nutrition aspect was the most common problem as participants were knowledgeable in disease-specific nutrition but their nutrition was not appropriately controlled and fewer participants were not knowledgeable about disease-specific nutrition. The second most problem was in the Examination aspect (21.93%) where the number of participants with common health problems was similar to that of participants with disease-specific health problems. The third most common problems were in the Medication aspect where most of them were the use of herbs, alternative medicines, or food supplements. Fewer cases faced a lack of care continuity. These findings of ours were different from those of Papapae and colleagues in Wapipathum district, where they found that the most common problem was the Immobility aspect.[6] This could be attributable to differences in social context from community to community. In Sinsamut community, the issues of disease-specific nutrition and the use of herbs should prompt the interventions from multidisciplinary team to slow down disease progression and ensure a safe use of such products, respectively.

The results from PCNE V7.0 guideline suggested unnecessary drug-treatment as the most prevalent DRP which were mainly caused by borrowing drugs from the neighbor and taking herbs or medicines by themselves without prescription or consultation with physicians or pharmacists, followed by untreated indication. These findings were consistent with that of Papapae et al.[6] but different from Rachaniyom et al. who found that the main problem was drug noncompliance.[11] From the findings, the danger of sharing medications should be emphasized more often.

About 10% of all DRPs were adverse drug events and dissatisfaction with the therapy. We found that there some elderly people took antihypertensive drugs but could not control their blood pressure and some diabetic patients were dissatisfied with their glycemic control. These findings were

consistent with the causes based on the PCNE V7.0 where the most frequently found causes of these DRPs were forgetting to take medicines followed by using unnecessary drugs and inappropriate drug storage. These findings were different from Papapae and colleagues[6] which found that the leading cause of DRPs was wrong administration of drugs. Rachaniyom et al. found that the main cause of DRPs was using food or drug supplements.

This study explored drug-related problems and their causes at the actual residence of the patients with NCDs. Consequently, the information was more reliable than that obtained at the healthcare setting. However, this study certainly had some limitations. Our sample size was relatively small. Since we conducted the survey on weekdays, some elderly people might have been working to earn their living. This limited information may not fully allow for a generalization to a larger population or to communities with different social or cultural contexts. We therefore recommended that future studies should plan for more home visits on the weekend and extend to more diverse communities to have an impact at the policy making level.

In conclusion, the elderly people in Sinsamut community, Pathumthani province have good health care behaviors but there should be a raising awareness on diet, weight control and the necessity of drug compliance as well as the use of herb with provider's consultation. Moreover, home care services provided by family pharmacists with multidisciplinary team in order to make the holistic approach should be promoted.

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