

## Polypharmacy Situation in Thambol Tubteelek of Muang District, Suphanburi Province

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**ABSTRACT:** Polypharmacy is one of the important factors involving drug-related problems (DRPs). Multiple medication use or polypharmacy is normally defined as the use of five or more medications at one time. The information about polypharmacy situation in Thailand is still limited; therefore, this study aimed to investigate the polypharmacy situation and assess the associated factors. There were 115 people participated in this study. All participants lived in Thambol Tubteelek, Muang district of Suphanburi province. Most of the people in this study were female and the average age of the participants was 56.5 years old. The prevalence of polypharmacy in this area was about 29%. Multiple logistic regression analysis was constructed. Factors that were statistically significantly associated with the use of five or more medications in the age-adjusted model were comorbidities. The odds ratios of participants with cardiovascular diseases and other ailments had a risk of polypharmacy more than those who had no comorbidities, respectively (OR = 8.76, 95% CI = 2.50, 30.72, OR= 4.61, 95% CI = 1.01, 21.21). These results implied that people in Tubteelek were facing polypharmacy situation, especially among those with cardiovascular diseases [the diseases in a group of non-communicable diseases (NCDs)]. Health practitioners should start to initiate a programme on pharmaceutical care to prevent and/or reduce the DRPs from polypharmacy. Moreover, a drug surveillance system should also be set up in the community in order to monitor patients who have already used multiple medications particularly among those with NCDs.

**Keywords:** Polypharmacy, drug-related problems (DRPs), comorbidities, cardiovascular diseases

## Introduction

Drug-related problem (DRP) or an event of drug treatment that interferes desirable health outcomes (Westerlund and Marklund, 2009) is increasing in most of the areas in Thailand. At present time, one of the outstanding causes of DRPs is due to polypharmacy (Hanlon *et al.*, 2001, Rochon and Gurwitz, 1999). Polypharmacy is an inappropriate or unnecessary medication use that may be resulting from multiple medications from one or more than one source of medications (Nancy, 2010). The problem may come from both the prescribed and self-used medications or over the counter (OTC) medications including vitamins and supplements. In certain instances, polypharmacy situation is arising from additional drugs for adverse effect treatment of primary medications (Milton and Jackson, 2007). As a whole, multiple drug use is leading to the increase of the risks of side effects, drug-drug interactions, drug-disease interactions, inappropriate drug use and non-compliance (Brekke, 2006). The cut off value of medications that can cause polypharmacy is not valid, yet. However, the use of three to five medications per day is commonly used as a cut-off point (Hanlon *et al.*, 2001; Bjerrum and Hallas, 1998). The elderly are more vulnerable to the adverse effects of drug use because of the change in their physiological conditions (Higashi *et al.* 2004). Moreover, the elderly with five or more drug use, four or more diagnoses, four or more prescribers, anti-hypertensive drug use, male, recent hospitalization, use of multiple pharmacies, OTC medications including herbs and vitamin or supplement use and dexterities impairment are at high risks of problems related with polypharmacy (Zarowitz, 2005; Mckinnon, 2003).

In Thailand, we are now facing a problem of noncommunicable diseases (NCDs) such as hypertension, diabetes and heart disease in the elderly. In addition, the tendency that the younger will have NCDs is also increasing (WHO, 2011). Once people suffers with these diseases, they have higher tendency to polypharmacy situation. Moreover, a drug surveillance system in Thailand is not well-established; therefore, the consumers can get varieties of medications, vitamins and supplement in drug stores or grocery stores out there without the knowledge relating to the precaution of those medications. DRPs involving polypharmacy are increasing because of

the lacking of awareness of health care professional on medication use for patients, the lacking knowledge of medication use of consumers themselves and also the lacking of the supervision of the availability of drugs, vitamins and supplements in the community. To prevent and reduce such problems, health practitioners have to firstly know the situation of polypharmacy in the community. After gathering all information of current situation of polypharmacy, health practitioners can then construct pharmaceutical care system to detect, manage and minimise DRPs involving polypharmacy situation in the community.

We undertook the study to investigate polypharmacy situation among pre-elderly and elderly in a suburban area under the responsibility of Tubteelek health promoting hospital of Thambol Tubteelek, Muang District, Suphanburi Province, Thailand. The result from this study can be useful to detect, minimise and prevent DRPs involving polypharmacy in this area. Subsequently, the information will be benefit to construct pharmaceutical care system and drug surveillance policy of Tubteelek primary health care to prevent negative effects from polypharmacy.

## **Material and Methods**

### ***Study population***

One hundred fifteen participants were randomly selected from a patient list of Tubteelek health promoting hospital, Thambol Tubteelek, Muang District, Suphanburi. Data was collected from May to June 2014. The study was approved by the IRB committee of Sirindhorn College of Public Health, Suphanburi, Thailand.

### ***Interview questionnaire***

Participants were interviewed by well-trained students from the Department of Pharmacy Technique, Sirindhorn College of Public Health, Suphanburi, Thailand. The questionnaire consisted of two parts. In the first part, participants were asked about their information, including age, gender, socioeconomic status, alcohol consumption and smoking behaviour. In the second part, participants were asked about their medication use information, for example: “How many prescribed medicines that you got from the hospital?” and “What are they?” Other questions about medication use were: “Did you use other drugs while taking medications from a hospital?”

and “ What are they?” In order to validate the medication use, participants had to show all the medications they have used to the interviewers.

### ***Statistical analysis***

Descriptive statistic was used to describe the characteristics of the study population, including age, gender, socioeconomic status, career and education. Polypharmacy was classified as using five or more medications, therefore, this outcome variable was categorised into two categories: less than 5 medication use and five or more medication use. The prevalence of polypharmacy was then calculated. Bivariate comparisons were used to explore the association between each categorical variable. Lastly, multiple logistic regressions were constructed to evaluate the association among variables of interest with medication use.

### **Results**

The total population of this study was 115 participants. The average age of the participants in this study was 56.45 years (SD=15.19). One fourths of the population was male. Most of them were married, had 1-3 children, had normal BMI, had less than 5000 baht per month and high school degree. In addition, about 90% were non-smokers and non-drinkers, and 39% of them had cardiovascular diseases (Table 1).

The prevalence of polypharmacy or the use of 5 or more medications at the same time was about 29% (Table 2). The Chi-square test was constructed to evaluate the association among lifestyle factors and polypharmacy. Factors that were statistically significantly associated with polypharmacy were age ( $p = 0.003$ ) and comorbidities ( $p < 0.001$ ).

In the age-adjusted model, the participants with cardiovascular diseases had 8.76 times (OR = 8.76, 95% CI = 2.50, 30.72) higher chance of using 5 or more medications at the same time than ones who had no disease. For those who had other comorbidities such as allergy and asthma had 4.61 times (OR= 4.61, 95% CI = 1.01, 21.21) higher chance of using 5 or more medications at the same time than those who had no disease in this model.

Table 1: The characteristics of study population in Thambol Tubteelek (N=115)

Characteristic	N (%)
1. Age (years)	
< 30	6(5)
30 - 60	56(49)
≥ 61	53(46)
2. Gender	
Male	25(22)
Female	90(78)
3. Marital status	
Single	17(15)
Married	97(85)
Divorce	1(0)
4. Parity	
Nulliparous	21(18)
1-3 births	72(63)
≥3 births	22(19)
5. BMI ( kg/m <sup>2</sup> )	
<18.5	7(6)
18.5-24.9	62(54)
25.0-29.9	35(31)
≥30	10(9)
6. Income (baht per month)	
No income	29(26)
Less than 5000	46(40)
5001-10000	23(20)
More than 10000	16(14)
7. Education	
High school	104(90)
High vocational	7(6)
Bachelor	4(4)
8. Occupation	
Government officer	2(2)
Farmer	21(19)
Own business	26(23)
Company worker	30(27)
Others*	33(29)
9. Smoking	
Non-smoker	100(87)
Former smoker	7(6)
Current smoker	8(7)
10. Alcohol consumption	
Non-drinker	101(88)

<b>Characteristic</b>	<b>N (%)</b>
3 times per month	4(3)
Less than 3 times per month	10(9)
<b>11. Comorbidities</b>	
No	56(49)
Cardiovascular diseases**	44(39)
Other	14(12)

Table 2: Prevalence of polypharmacy (use of five or more medications) (N=115)

<b>Number of total medication use</b>	<b>N(%)</b>
< 5 medications	82 (71)
≥ 5 medications	33(29)

## **Discussion**

In this cross-sectional study, the prevalence of polypharmacy in Tubteelek community was not that low. Most of the people in this community were elderly with comorbidities especially cardiovascular diseases such as hypertension and diabetes. Cardiovascular disease under the NCD group is the problem of the people not only in Tubteelek community but also all around Thailand particularly in the elderly at the present time. Comorbidities especially hypertension and diabetes are major cause of polypharmacy in this community. The reasons that support this problem could be resulted from three channels: 1) Medical care from the hospital: doctors tend to prescribe more medications for people who have these kinds of illness, 2) Other available sources of medications: those who have hypertension or diabetes tend to have other health problems and often buy other medications from other sources in the community, and 3) Family and friends: hospitality is high among Thai people. When they know that one is sick, they prefer to help or offer some medicines such as herbs and vitamins/supplements to help sick people to get better.

Drug use behavior of people is more complicated among Thai people because there are the many ways to access medications. Moreover, Thai people can approach a health care system better than the past. We have variety kinds of privileges among people in the society to access health

services from public hospitals such as government officers, social insurance and others. The gap of receiving health services among people in the society comparing to the past is decreasing. The more people can easily get the health services from public section, the rate of drug utilisation we tends to increase.

There were limitations in our study. First, some factors were not investigated in this study such as depressive symptoms and physical activity. Second, for the comorbidities other than cardiovascular diseases (hypertension and diabetes), we cannot categorise them into separate group due to the limited number of these particular diseases, but under a group of “other illness”. However, our study had many strengths. First, limited studies were conducted to investigate the polypharmacy situation in Thailand. Second, we considered polypharmacy situation not only the medication use from hospital but also other sources of medication such as OTC drugs, and drugs from family and friends. Third, the interviewers were well-trained pharmacy technique students; therefore, our information had more validity. Forth, we tried to minimise the bias of our data by requesting the participants to show all the medications that they currently used to the interviewers.

## **Conclusion**

This study is the first step for solving DRPs in Tubteelek community. Next step, we will focus on the elderly who have NCDs and conduct the drug evaluation onto them. In the near future, we could study the major pairs of medication use with drug interactions that can cause adverse health effects, and also monitor the medication system in order to minimise the risks arisen from these problems.

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