



ISSN: 2231-3354  
 Received on: 11-11-2011  
 Revised on: 19-11-2011  
 Accepted on: 23-11-2011

## Use of nonprescription medications by the general public in the Klang Valley

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### ABSTRACT

The use of nonprescription medications is increasing worldwide as the practice of self-medication becomes more common. This is a cross-sectional study which was conducted to determine the extent and types of nonprescription medications used in the Klang Valley. Data was collected via interview using a structured questionnaire, at 10 shopping complexes and high streets in the Klang Valley. A total of 400 respondents were recruited with 61.5% female. The mean age of the respondents (standard deviation) was 33.4 (11.8) years old. Of the 400 respondents, 298 (74.5%) had used a nonprescription medication before. Demographic data of the respondents was not associated with the use of nonprescription medications except for marital status. Respondents who were single were more likely to use nonprescription medications than married or widowed/divorced respondents ( $p = 0.040$ ). Analgesics were the most commonly used nonprescription medications in the Klang Valley (35.9%), followed by cough (17.2%) and cold preparations (11.7%). Whereas, paracetamol was the active ingredient most commonly found in the nonprescription medications used (47.2%). Out of the 298 respondents who have used nonprescription medications before, 234 (78.5%) obtained their medication(s) from pharmacies while 21.5% from non-pharmacy outlets such as doctors' clinics, grocery shops, Chinese medical halls, supermarkets, 7-Eleven convenient stores and medical centres. The common sources of information on nonprescription medications were pharmacists (48%), family members or friends (18.8%) and doctors (16.8%). Therefore, pharmacists have a significant role to play in the selection and safe use of nonprescription medications.

**Keywords:** Over-the-counter, nonprescription, self-medication, pharmacist

### INTRODUCTION

Nonprescription medications (NPMs) are referred to as over-the-counter (OTC) medications in some countries. These are medications which may be bought without a prescription (Wazaify et al. 2005). In Malaysia, pharmaceutical products are categorized into two main classes: "Poison" and "Non-Poison" items. "Poison" items are further subdivided into two major groups for the treatment or prevention of health problems: Group B (required a prescription) and Group C (can be dispensed by a licensed pharmacist with or without a prescription). "Non-Poison" items include drugs that are not listed in the Poison Act (1952) by the Ministry of Health in Malaysia and can be purchased from anywhere. In Malaysia, NPMs include drugs classified under Group C and also Non-Poison, which are medications that can be purchased without a prescription. NPMs are primarily used to treat minor health conditions that do not require the direct supervision of a doctor, proven to be reasonably safe and have few side effects as they are usually well-tolerated. Generally, NPMs can be bought from pharmacies and some from non-pharmacy retail outlets. Examples of NPMs include mild analgesics, antihistamines, cold medications, cough preparations, nasal sprays, ear care products, antacids, antidiarrhoeals and laxatives, topical preparations and

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foot care products (Conover 2002). These groups of medications are also available as NPMs in Malaysia.

An increase in the availability of NPMs and difficulty in access to healthcare service resulted in more people turning to self-medication. Consumer convenience is an important factor contributing to such practice as NPMs are easily accessible (Almendral *et al.* 2006; Ferner and Beard 2008; Maves 2000). The use of NPMs saved time as the consumers did not have to travel and spend time waiting to see a general practitioner (GP) (Ferner and Beard 2008; Wazaify *et al.* 2005; Yousef *et al.* 2008).

The extent of use of NPMs varied from 30 to 97% (Douglas *et al.* 2004; Goh *et al.* 2009; NCPIE 2002; Okumura *et al.* 2002). The large variation may be attributed to studies from different countries, study population with different demographic characteristics, different definition of terminologies used and length of recall period. The definition of NPMs may differ from one study to another. Some studies included health supplements, vitamins and minerals as NPMs (Almendral *et al.* 2006; Douglas *et al.* 2004; Goh *et al.* 2009; Sleath *et al.* 2001). The length of the recall period may also affect the results of each study. Short recall period will be more reliable as it is easier for the respondents to remember the NPMs which they have used. Long recall period has more problems with recall bias but more comprehensive information could be obtained.

Most studies reported that analgesics were the most common type of NPMs used (Douglas *et al.* 2004; Drug Utilization Research Group 1997; Goh *et al.* 2009; Simoni-Wastila *et al.* 2006; Sleath *et al.* 2001). Minor health conditions commonly treated with NPMs included headache, fever, colds, coughs, sore throat, dermatologic conditions (such as acne, cold sores, dandruff, head lice and athlete's foot), muscle ache, migraine and thrush (NCPIE 2002; Thomas and Noyce 1996). In Malaysia, minor health problems that were commonly treated with NPMs were skin problems, aches and pain, eye, ear and mouth problems (Ibrahim 1996).

Many studies have been conducted on the extent of NPM use. However, such studies are still scarce in Malaysia. Therefore, this study was conducted to fill the information gap by exploring the extent and types of NPM used by the general public in the Klang Valley.

## METHODS

This is a cross-sectional study which involved interviewing members of the general public regarding the use of NPMs, which were defined as medications that can be obtained legally without seeing a doctor. These included drugs classified under Group C and Non-Poison items in Malaysia. However, health supplements such as vitamins and minerals were not considered as NPMs in this study.

A pilot study was conducted to test the feasibility of the research methodology and to ensure that the questionnaire was adequately formulated to gather all the information required. Thirty members of the general public were recruited in the pilot study. Problems encountered during the pilot study were resolved and the

questionnaire modified accordingly before commencement of the main study. The questionnaire was prepared in two languages, English and Malay as most Malaysians can understand either of these two languages.

The study was conducted in the Klang Valley in 2007. The Klang Valley comprises of Kuala Lumpur and its surrounding areas, the main commercial hub of Malaysia. Areas in the Klang Valley were divided into five regions: (i) Kuala Lumpur (ii) Petaling Jaya (iii) Subang (iv) Shah Alam and (v) Klang. Five shopping centers and five high streets were selected as the survey sites using convenience sampling. The shopping centers included were Kuala Lumpur Convention Centre (KLCC), Midvalley Megamall, Ampang Point, Amcorp Mall, and Klang Parade while the five high streets were in Pudu, Sections 2 and 14 in Petaling Jaya, Sunway and Shah Alam.

A researcher spent 2 to 3 days in each survey site, including both weekdays and weekends, from 10:00 to 17:00 hour so that people who visited the survey sites on different day of the week could be sampled. Any member of the general public who appeared to be above 18 years old was approached by the researcher to participate in the study. The researcher explained the objectives and procedure of the study to the potential respondent. If the potential respondent agreed to participate, a "Respondent Information Sheet" was given. The researcher then proceeded with the interview and recorded all information in the questionnaire. Each interview took about 5-10 minutes.

All data obtained was analyzed using the Statistical Package for Social Sciences (SPSS) version 15.0. Descriptive analysis was performed on all the variables to obtain the frequency and percentage. Factors which might be associated with the use of NPMs were determined using Pearson's chi-square test. A *p* value of less than 0.05 was considered as statistically significant.

## RESULTS AND DISCUSSION

A total of 400 respondents were included in this study. Demographic data of these respondents are shown in Table 1. The age of the respondents ranged from 18 to 72 years old with a mean (standard deviation) of 33.4 (11.8) years old and a median of 31 years old. "Others" under ethnic group represented only one (0.3%) respondent who was a Bengali. This study classified the occupation of the respondents into non-working, professional, and non-professional. The non-working respondents in this study included students, housewives and retired persons while the professional group of respondents were those employed as engineers, architects, accountants, lawyers, lecturers, tutors, dieticians, designers and programmers. Whereas, the non-professional group consisted of those employed in administrative or managerial, sales or marketing, education, business, technical and service sectors.

Of the 400 respondents, 74.5% (298 respondents) had used a NPM before. This indicates that the use of NPMs is a common practice in the Klang Valley. Of the 298 users, 205 bought their own NPMs while the other 93 used the medications bought by someone else. Less than half of the respondents (166,

**Table 1:** Demographic data of respondents (n=400).

Demographic data		Number of respondents	Percentage (%)
<b>Gender:</b>	Male	154	38.5
	Female	246	61.5
<b>Age:</b>	< 21	41	10.3
	21 to 30	154	38.5
	31 to 40	103	25.8
	41 to 50	66	16.5
	51 to 60	25	6.3
	> 60	11	2.8
<b>Ethnic</b>	Malay	176	44.0
	Chinese	150	37.5
	Indian	73	18.3
	Others	1	0.3
<b>Marital status</b>	Single	162	40.5
	Married	231	57.8
	Widowed/Divorced	7	1.8
<b>Level of education</b>	Primary	28	7.0
	Secondary	139	34.8
	College	123	30.8
	University	98	24.5
	Postgraduate	12	3.0
<b>Occupation</b>	Not working	110	26.6
	Professional	21	5.1
	Non-professional	283	68.4
<b>Household income:</b>	<=RM 1000	63	15.8
	RM 1001 to 3000	217	54.3
	RM 3001 to 5000	70	17.5
	RM 5001 to 7000	25	6.3
	RM 7001 to 10,000	18	4.5
	>RM 10,000	7	1.8
<b>Health expenses</b>	Self	246	61.5
	Government	76	19.0
	Private company	42	10.5
	Insurance	36	9.0

41.5%) used a NPM during the past one month prior to the interview. This increased to 56.3% (225 respondents) when a 6-month recall period was used and to 71.3% (285) if the last one year was considered. Similarly, a report stated that 59% of Americans had used a NPM during the past six month (NCPIE 2002). The increase in use of NPMs is partly attributed to the growing confidence in self-medication in the past two decades (Blenkinsopp and Bradley 1996; Goh et al. 2009). The general public has also become increasingly more knowledgeable due to advance in information technology which allows easier access to drug information. In addition, it is generally believed that NPMs do not usually have serious side effects as only safe medications are allowed to be sold without a prescription (Wazaiy et al. 2005).

Some respondents used more than one NPM. The types of NPMs used were classified according to the organ system in the British National Formulary (BNF 2009). A total of 439 NPMs were used, which constituted various classes of medications as shown in Table 2. However, the respondents did not know the name and indication of four medications and hence these were excluded from Table 2. Analgesics were the most common NPMs used (35.9%), followed by cough preparations (17.2%) and systemic nasal decongestants (11.7%). This result is similar to that

**Table 2:** Classes of commonly used nonprescription medications

Classes of nonprescription medications	Frequency	Percentage (n =435)
1 <b>Central nervous system</b>	<b>157</b>	<b>36.1</b>
Oral analgesics	156	35.9
Antiemetics	1	0.2
2 <b>Respiratory tract</b>	<b>142</b>	<b>32.6</b>
Cough preparations	75	17.2
Systemic nasal decongestants	51	11.7
Antihistamines	16	3.7
3 <b>Skin</b>	<b>48</b>	<b>11.0</b>
Topical antipruritics	12	2.8
Skin cleansers and antiseptics	11	2.5
Emollient and barrier preparations	7	1.6
Topical preparations for acne	6	1.4
Topical anti-infectives	5	1.1
Preparations for warts and calluses	4	0.9
Preparations for eczema and psoriasis	1	0.2
Sunscreen preparations	1	0.2
Topical circulatory preparations	1	0.2
4 <b>Ear, nose and oropharynx</b>	<b>41</b>	<b>9.4</b>
Lozenges and sprays	37	8.5
Drugs for oral ulceration and inflammation	4	0.9
5 <b>Gastrointestinal tract</b>	<b>25</b>	<b>5.7</b>
Drugs for acute diarrhoea	9	2.1
Laxatives	7	1.6
Indigestion preparations	5	1.1
Antacids and simethicone	4	0.9
6 <b>Musculoskeletal and joint diseases</b>	<b>7</b>	<b>1.6</b>
External analgesics	7	1.6
7 <b>Eye</b>	<b>7</b>	<b>1.6</b>
Tear deficiency, ocular lubricants and astringents	5	1.1
Anti-infective eye preparations	1	0.2
Contact lens solution	1	0.2
8 <b>Obstetrics, gynaecology, and urinary tract disorders</b>	<b>5</b>	<b>1.1</b>
Contraceptives	4	0.9
Treatment of vaginal and vulval conditions	1	0.2
9 <b>Nutrition and blood</b>	<b>2</b>	<b>0.5</b>
Oral preparations for fluid and electrolytes imbalance	2	0.5
10 <b>Cardiovascular system</b>	<b>1</b>	<b>0.2</b>
Antiplatelet drugs	1	0.2

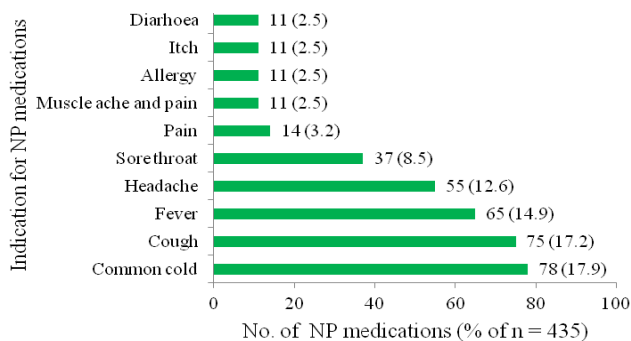
of other studies (Douglas *et al.* 2004; NCPIE 2002; Sleath *et al.* 2001). This is probably due to an increase in self-medication for cough and cold over the past decade as the general public becomes more educated and is aware that coughs and common colds are self-limiting hence can be relieved symptomatically with NPMs without the necessity to see a doctor.

The common active ingredients found in the NPMs used by at least five respondents are shown in Table 3. Of the 439 nonprescription medications used, the respondents did not know the names of 140 hence these were excluded from Table 3. The most common active ingredient used was paracetamol which was also reported by other studies (Goh *et al.* 2009). Paracetamol is contained in products such as Panadol<sup>®</sup>, Panadol Cold and Flu<sup>®</sup>, Panadol Extend<sup>®</sup>, Panadol Soluble<sup>®</sup> and Panadol Menstrual<sup>®</sup>.

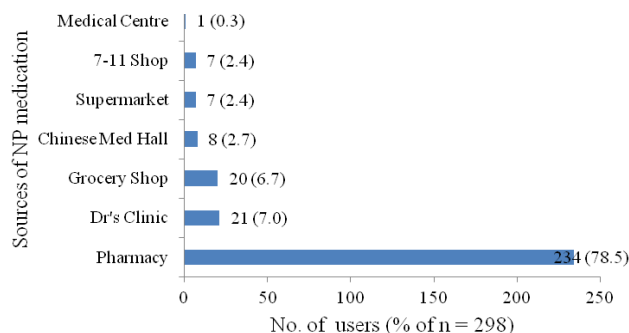
Dichlorobenzyl alcohol and amylmetacresol were found in Strepsils®. The maximum doses of paracetamol for adults should not exceed 4 gram (usually 8 tablets) per day. Therefore, pharmacists must emphasize such precaution to the general public to prevent misuse and to minimize the occurrence of side effects. Other active ingredients which were commonly used were mainly for the symptomatic relief of cough and cold, fever and headache. The indications of NPMs in this study are shown in Figure 1.

**Table 3:** Active ingredients in nonprescription medications used.

Active ingredients in nonprescription medications	No. of nonprescription medications (%) (n = 299)
Paracetamol	141 (47.2)
Dichlorobenzyl alcohol and amylmetacresol	18 (6.0)
Pseudoephedrine	16 (5.4)
Menthol	13 (4.3)
Guaifenesin	12 (4.0)
Methylsalicylate	9 (3.0)
Dequalinium chloride	9 (3.0)
Camphor	8 (2.7)
Aluminium hydroxide	7 (2.3)
Dextromethorphan	5 (1.7)
Mefenamic acid	5 (1.7)
Diphenhydramine HCl	5 (1.7)



**Fig. 1:** Indications of nonprescription medications.



**Fig 2:** Sources of nonprescription medications.

### Sources of nonprescription medications

Users of NPMs obtained their medications from various sources (Figure 2). Of the 298 respondents, 234 (78.5%) obtained their medication(s) from pharmacies while 21.5% (64) were from non-pharmacy outlets. This indicates that the general public in the Klang Valley trusts the pharmacies to supply NPMs. In addition,

the Klang Valley has the highest number of pharmacies in Malaysia and hence NPMs are easily accessible to the general public. Similar results were obtained in other studies (Ho et al. 1996; Wazaify et al. 2005)

Consequently, 143 users (48.0%) sought information concerning their NPMs from pharmacists, 56 (18.8%) from parents, relatives or friends, 50 (16.8%) from doctors, 23 (7.7%) from advertisements or television, 18 (6.0%) from sales representatives, 7 (2.3%) from product package or inserts and one (0.3%) from a non-specified source. Another study found similar results as more than 60% of their respondents seek advice from pharmacists rather than doctors if they deemed their health problems were not serious enough to see a doctor (Wazaify et al. 2005). Another possible reason could be that most of the NPMs were obtained from community pharmacies hence, more convenient to ask the pharmacists about these medications. In addition, consultation with pharmacists is free in Malaysia. This highlights the roles of pharmacists in counselling the consumers on the appropriate use of NPMs to optimise its benefits and minimise its risk.

### Outcomes of using nonprescription medications

Of the 439 NPMs used, 76.8 % (337) resulted in the users feeling better [including 16.9% (74) which made the users felt much better]. However, 5.7% (25) of the NPMs did not make any difference to the users while 0.5% (3) made the users felt worse. Two of these cases involved antihistamines [Zyrtec® (cetirizine) and Piriton® (chlorphenamine)] while another case was a cough preparation [Robitussin® (guaifenesin)]. The users reported that they had constipation after taking Robitussin® and Zyrtec® while Piriton® caused drowsiness.

Respondents reported that 81 (18.5%) of the NPMs used were associated with side effects. These included 70 (16%) which were associated with drowsiness, four (0.9%) with nausea, three (0.7%) with bloating, two (0.5%) with vomiting and another two with constipation. This indicates the importance of pharmacists in providing adequate information on NPMs, including warning the consumers of its potential side effects.

Out of 298 users, 159 (53.4%) agreed that NPMs were safe to use. This included 40 respondents who felt that the safety of NPMs depended on the minor health problems they encountered. If the health problem was serious, they preferred to see a doctor. Another 99 users (33.2%) did not agree that NPMs were safe to use for their minor health problems. The results of this study are similar to that by Wazaify et al. (2005) where 47.2% of the respondents agreed that NPMs were totally safe to use. It has been recommended that although the effectiveness of some NPMs has not been proven, safety of such medications should be the utmost priority (Ferner and Beard 2008).

### Predictors of nonprescription medication use

Potential predictors of nonprescription medication use are shown in Table 4. Demographic characteristics of respondents did not affect the use of NPMs except for marital status ( $p = 0.040$ ).

**Table 4:** Potential predictors of nonprescription medication use.

Predictors	No. of respondents	Users of NPMs (%)	$\chi^2$ (p value)
<b>Gender:</b>			
Male	154	109 (70.8)	1.825
Female	246	189 (76.8)	(0.177)
<b>Age (years):</b>			
< 21	41	32 (78)	6.033
21 to 30	154	117 (76)	(0.303)
31 to 40	103	71 (68.9)	
41 to 50	66	48 (72.7)	
51 to 60	25	19 (76)	
> 60	11	11 (100)	
<b>Ethnic group:</b>			
Malay	176	126 (71.6)	1.548
Chinese	150	114 (76)	(0.461)
Indian	74	58 (78.4)	
<b>Marital status:</b>			
Single	162	131 (80.9)	6.447
Married	231	163 (70.6)	(0.040)*
Widowed/divorced	7	4 (57.1)	
<b>Level of Education:</b>			
Primary	28	20 (71.4)	2.098
Secondary	139	102 (73.4)	(0.718)
College	123	92 (74.8)	
University	98	73 (74.5)	
Postgraduate	12	11 (91.7)	
<b>Occupation:</b>			
Non-working	110	88 (80)	3.732
Professional	21	13 (61.9)	(0.155)
Non-professional	269	197 (73.2)	
<b>Household income:</b>			
≤ RM1000	63	50 (79.4)	7.824
RM1001 - 3000	217	161 (74.2)	(0.166)
RM3001 – 5000	70	45 (64.3)	
RM5001 – 7000	25	21 (84)	
RM7001 – 10,000	18	16 (88.9)	
≥ RM10,000	7	5 (71.4)	
<b>Health expenses paid by:</b>			
Self	246	189 (76.8)	5.743
Government	76	49 (64.5)	(0.125)
Private company	42	34 (81)	
Insurance	36	26 (72.2)	

Respondents who were not married were more likely to use NPMs than married persons. This may be because unmarried respondents preferred to use NPMs as it is more convenient while married respondents may be more careful and hence preferred to consult a doctor even for minor health problems as they have more responsibility to consider. Goh et al. (2009) also found that NPM use was not associated with the age, gender and education level of respondents. In addition, Nielson et al. (2003) reported that the socio-economic position of their respondents was not associated with the use of NPMs.

#### Limitations of the study

The study was conducted in the Klang Valley and hence may not represent the behaviour of the general public in the whole of Malaysia. Future study can be carried out in different parts of Malaysia, including urban and rural areas. In addition, the interviews were conducted from 10:00 to 17:00 hour hence any person who visited the study sites in the evening would not be sampled. Some of the respondents have difficulty in recalling the

last time they used a NPM and/or the name of the medication used. This resulted in inaccurate or incomplete information. The effect of this problem may be reduced with an increase in the sample size.

#### CONCLUSIONS

Use of NPMs is a common practice in the Klang Valley. The study showed that central nervous system (CNS) medications especially oral analgesics were the most common type of NPMs used by the general public. Respiratory medications were the second most commonly used, followed by skin preparations.

The respondents tend to obtain their NPMs from pharmacies. Therefore, pharmacists have a significant role to play in the selection and safe use of NPMs. In addition, information obtained in this study can be used to improve the curriculum of pharmacy programmes in Malaysia so that future pharmacists are better equipped to counsel the general public on the use of NPMs.

#### ACKNOWLEDGEMENTS

We would like to express our greatest appreciation to all the respondents for spending their time to answer our questionnaire.

The results of this study has been published as an abstract in the Malaysian Journal of Pharmacy and presented in the Malaysian Pharmaceutical Society Pharmacy Scientific Conference (MPS-PSC) 2011 held in Istana Hotel, Kuala Lumpur on 22 to 23 October 2011.

#### Conflict of interests

The authors declare that they have no conflicts of interest to disclose.

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