Original Article

Knowledge, Attitude and Practice towards Self-Medication of Non-Steroidal Anti-Inflammatory Drug (NSAID) among First-Year Non-Health Science Undergraduates in Klang Valley, Malaysia

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Abstract

Background: Non-Steroidal Anti-Inflammatory Drugs (NSAID) are commonly used analgesics among the public, secondary to paracetamol. Despite of its wide usage, the knowledge, attitude and practice on NSAID is yet to be determined among the first-year non-health science undergraduates in Klang Valley, Malaysia.

Objective: The objective of this study is to assess the level of knowledge, attitude and practice of NSAID usage among the

first-year non-health science undergraduates regarding self-medication of NSAID.

Materials & Methods: A cross-sectional study design was adapted. A self-administered questionnaire was distributed to 402 first-year non-health science undergraduates from various universities located in Klang Valley, Malaysia. Undergraduates who were on long term usage of NSAID was excluded in the study and convenient sampling was incorporated.

Results: A total of 56.47% of participants showed low knowledge level towards NSAID and an average level of attitude (mean score: 20.16 ± 2.674) was obtained from the study. Up to 58.95% of participants were adherent towards the usage of NSAID according to advices given. The result further showed significant association between the education stream and their attitude (p=0.012), as well as between the ethnicity and their practice level (p=0.025).

Conclusion: In conclusion, the level of knowledge of NSAID is low but a satisfying level of attitude and practice on NSAID

usage are noticed among the first-year non-health science undergraduates.

Keywords: First-year Non-health Science, Non-Steroidal Anti-Inflammatory Drug, Self-Medication, Undergraduate

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Introduction

Non-steroidal anti-inflammatory drug (NSAID) is a group of analgesic and anti-inflammatory agent, or better known as pain reliever for the public. It inhibits the production of cyclooxygenase (COX), an enzyme in the body which is responsible for signalling pain and inflammation through production of prostaglandin, thus exhibiting the anti-inflammatory and analgesic effect[1]. NSAID is classified as part of the poison drug and it can only be obtained either through prescription or dispensed by the healthcare professionals due to

its legality in Malaysia's setting[2]. Even though the side effects are serious, such as stomach ulceration and kidney failure upon misuse of NSAID in daily life, the usage of NSAID is still high among the public, especially for self-medication cases in relieving pain. Self-medication is defined as an act of treating a self-recognised disease without seeking any consultation from the healthcare professionals through the usage of medications[3]. The practice of self-medication with analgesic is getting more common among the public nowadays due to various ~~of~~ factors and this ~~had~~ has become a worrying issue as the public might not be using the appropriate type or dose of medication for their complaints, especially when they suffered from other health issue during the treatment period[4].

The knowledge on NSAID among the public is relatively low which further increases the risk of getting dependence and adverse drug reaction due to misuse of NSAID[5] and it was noted that in a study, more than half of the respondent were not aware on the side effects of NSAID as well as the possibility of drug dependence on NSAID after prolonged usage[6]. This is an

alarming phenomenon especially in teenagers whom are common with the complaint of headaches due to studies or sports injuries, where the self-medication practice of analgesic is high[7,8]. On the other hand, studies have shown that higher education level, majoring in health sciences programmes did show a better knowledge towards NSAID, but it also portraited a higher practice rate of self-medication using it, even when they are aware on the adverse drug reaction[9,10,11]. Furthermore, public also showed a negative attitude towards NSAID where most of them were not aware on the toxic dose of NSAID and this further affected the safe use of NSAID among the public[12,13,14].

University undergraduates are always working under pressure to achieve their study goals, making use of their time to study and constantly exposed themselves towards minor illness, especially headaches. As there are numerous types of analgesics, which includes paracetamol and NSAID, which contains different types of active ingredients, there is a possibility that the undergraduates might chose the unsuitable medication for themselves[14]. In short, the aim of the survey is to assess the level

of knowledge, attitude and practice of NSAID usage among users and non-users from first-year non-health science undergraduates regarding the self-medication of NSAID. As most of the research surveys target on various years of health-science undergraduates, this survey targeted the first-year undergraduates who are newly introduced to their respective degree programme as their stress level might be lower compared to the higher education level undergraduates. Besides that, by focusing on the non-health science undergraduates, we would be able to obtain the raw result from population that had not been exposed to any health sciences related elements as this will affect the result in knowledge and attitude of NSAID.

Materials and Methods:

Study design, population and sample size

A cross-sectional study design was adopted. A self-administered questionnaire was distributed to the first-year non-health science undergraduates among the universities in Klang Valley, Malaysia from August 2018 to October 2018. Convenient sampling technique was used during the distribution

of questionnaires to the 402 participants and a minimum sample size of 385 participants was needed to achieve 95% confidence interval. The minimum sample size was calculated using the Cochran's formula $n_0 = \frac{z^2pq}{e^2}$, through the assumption of maximum variability (50% of total), 95% confidence interval and ±5% of precision (p=0.5;q=1-0.5;e=0.05;z=1.96; $n_0 = \frac{(1.96)^2(0.5)(0.5)}{(0.05)^2} = 385$)

Inclusion and exclusion criteria

First-year non-health science undergraduates, including both Malaysian and International students from the universities located in Klang Valley, Malaysia were included in the study. However, if the participant had been on long term usage of NSAID (defined as more than two weeks' usage for all types of NSAID except aspirin and more than twelve weeks for aspirin) in the previous twelve months, they were excluded from the study.

Study instruments

The self-administered questionnaire was prepared by adapting questions from different reference articles[7,15,16] and reconstructed into a total of four sections with six to seven questions respectively for each section for participants to answer. The questionnaire consisted of a total of twenty-eight questions and had been validated through phase study by distributing to eighteen participants who acted as respondent for pilot study of the survey. A table of common NSAID that is being sold in Malaysia was included in the questionnaire after the consent form for the participants to identify the respective analgesic used and paracetamol or acetaminophen was notified to the participants as not part of NSAID due to its minor anti-inflammatory effect and were excluded in the table provided.

The first section was targeting on the socio-demographic details of the participants, followed by the second section which contained questions related to the knowledge of NSAID. Each correct answer in this section was awarded with 1 point and a total of 7 points could be obtained in this section. The third

section was statements related to the attitude of participants towards NSAID usage and participants were asked to answer through the usage of Likert Scale. Points were given according to the scoring of the statement excluding Q15 where a score of 1 was awarded with 5 points instead. A total of 30 points could be accumulated in this section.

The last section comprised of questions related to the practice towards NSAID usage among the participants and each 'No' answer was awarded with 1 point, excluding Q26 where a 'Yes' answer was awarded with 1 point instead and a total of 6 points could be obtained in this section. The final two questions were multiple answers question which served as extra information to understand the sources of information related to NSAID and the reason of self-practising with NSAID among the participants.

Data Collection

The questionnaires were answered face-to-face and the participant was given a maximum of 15 minutes to answer the questionnaire and it was collected on the same day.

Statistical Analysis

The data collected was analysed using Statistical software SPSS version 23 and was interpreted using descriptive statistics and chi-square test. $p<0.05$ was considered significant.

Result

Socio-demographic

A total of 402 participants were included in the survey with a mean age of 20.26 ± 1.71 years old. Among the 402 participants, 12.9% (n=52 of 402) of participants were NSAID user during the past twelve months, which also known as current users in the article thereafter and 87.1% (n=350 of 402) of the participants were non-user as per recorded in Table 1.

Table 1: Socio-demographic of participants (n=402)

Characteristic	Total Participants (n=402)	User (n=52)	Non-User (n=350)
Age (y), mean (± SD)	20.26 ± 1.71	20.87 ± 2.02	20.17 ± 1.64
User of NSAID, n (%)			
Yes	52 (12.9)		

No	350 (87.1)		
Gender, n (%)			
Male	165 (41.0)	20 (38.5)	145 (41.4)
Female	237 (59.0)	32 (61.5)	205 (58.6)
Nationality, n (%)			
Malaysian	334 (83.1)	46 (88.5)	288 (82.3)
Other	68 (16.9)	6 (11.5)	62 (17.7)
Ethnicity, n (%)			
Chinese	208 (62.3)	15 (33.3)	193 (66.8)
Indian	50 (15.0)	12 (26.7)	38 (13.1)
Malay	63 (18.9)	18 (40.0)	45 (15.6)
Others	13 (3.9)	0 (0.0)	13 (4.5)
Education Steam, n (%)			
Art Stream	342 (85.1)	42 (80.8)	300 (85.7)
Science Stream	60 (14.9)	10 (19.2)	50 (14.3)

Knowledge

Based on the result showed in Table 2, it was noted that 47.8% of the total participants had answered correctly for Question 7, which the question asked about the indication and effects of NSAID and among the current users, a high percentage

of 86.5%had the correct answer, compared to 42.0% from the non-user group.

Table 2: Participants' knowledge on NSAID

QN	Statement	Correct (%) (n=402)	User (n=52)	Non-User (n=350)
1	**NSAID medicines can relieve pain, reduce fever and contain anti-inflammatory effects.**	192 (47.8)	45 (86.5)	1472.0)
2	**NSAID medicine can reduce formation of blood clots.**	50 (12.4)	6 (11.5)	44 (12.6)
3	**NSAID medicines may cause harm to your kidney if they are misused.**	185 (46.0)	41 (78.8)	144 (41.1)
4	**NSAID medicines may cause stomach ulcer if they are misused.**	111 (27.6)	23 (44.2)	88 (25.1)
5	**All the NSAID medicines registered in Malaysia are totally safe to use without any side effects.**	38 (9.5)	7 (13.5)	31 (8.9)

6	**NSAID medicines can be consumed along with corticosteroid (i.e. Prednisolone) or herbal medicines such as Gingko Biloba and St. John's wort.**	35 (8.7)	8 (15.4)	27 (7.7)
7	**NSAID medicines are the same as antibiotic.**	42 (10.4)	9 (17.3)	33 (9.4)

***QN indicates the question number.**

***Data reported in brackets represents the percentage (%).**

According to the result showed in Table 3, there was no significant difference between the genders, nationality, ethnicity among the Malaysians and the education stream in the scoring of knowledge of NSAID, however significant difference was found between the users' group ($p<0.05$).

Table 3: *p*-value for each variable in knowledge section.

QN	*p*-value *				
	Gender	**Nationality**	**Ethnicity**	**Education Stream**	**Users**
1	0.258	**0.007**	**0.042**	**0.006**	**<0.001**

2	0.086	0.580	**0.030**	0.300	0.817
3	0.070	0.528	**0.010**	**0.031**	**<0.001**
4	0.090	0.387	**0.036**	0.175	**0.013**
5	0.933	**0.029**	**0.001**	**0.002**	**0.001**
6	0.109	0.618	0.726	0.801	**0.033**
7	0.142	0.126	**0.003**	0.301	**<0.001**

***p*-value which is in bold showed significant differences ($p<0.05$).**

However, when breaking down into each questions, Question 7 and Question 11 showed significant differences in all the variables except in the genders. Furthermore, when subject to each variables' group, it was noticed that there were significant differences among the ethnicity and users' group in all the knowledge questions except for Question 12 among the ethnicity group and Question 8 between the users' group.

Overall, according to Table 4, up to 227 participants (56.47%) of the participants scored 2 points and below, indicating poor knowledge on NSAID among this studies population, 163 participants (40.55%) scored between 3 points to 5 points, indicating for moderate knowledge level obtained

on NSAID and 11 participants (2.98%) scored 6 points and above that portraited a good knowledge level of NSAID.

Attitude

Refer to Table 4, most of the participants showed neutral attitudes towards NSAID usage.

Table 4: Participants' attitudes towards NSAID

QN	Statement	Responses, n (%) (n=402)				
		Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
1.	Self-medication of NSAID will be harmful if they are taken for long period.	4 (1.0)	16 (4.0)	151 (37.6)	147 (36.6)	84 (20.9)
2.	The course of NSAID medicines must be completed although the symptoms are subsided.	20 (5.0)	62 (15.4)	238 (59.2)	59 (14.7)	23 (5.7)
3.	Pharmacists can provide best	6 (1.5)	27 (6.7)	160 (39.8)	132 (32.8)	77 (19.2)

	advice or information regarding NSAID medicines.					
4.	**The medication leaflet shall be studied before consumption of NSAID to understand more on the usage and precautions.**	7 (1.7)	13 (3.2)	163 (40.5)	127 (31.6)	92 (22.9)
5.	**NSAID medicines can be purchased in any pharmacy upon request without**	46 (11.4)	82 (20.4)	179 (44.5)	62 (15.4)	33 (8.2)

	prescription from doctor.					
6.	**NSAID medicines help to relieve the pain more effective compared to other alternative medications.**	3 (0.7)	30 (7.5)	267 (66.4)	71 (17.7)	31 (7.7)

***Data reported in brackets represents the percentage (%).**

There was a significant difference between the users and non-users regarding their attitude towards NSAID, as well as within the education stream and ethnicity ($p<0.05$) as shown in Table 5.

Table 5: *p*-value for each variable in attitude section.

QN	***p*-value ***				
	Gender	**Nationality**	**Ethnicity**	**Education Stream**	**Users**
1.	0.989	**0.012**	0.329	**0.005**	**0.010**

2.	0.873	0.793	0.502	**0.009**	**0.007**
3.	0.287	0.290	**0.001**	**0.008**	**0.008**
4.	0.080	0.126	**0.029**	**0.004**	**0.022**
5.	0.978	0.599	**0.002**	0.255	**<0.001**
6.	**0.020**	**0.030**	0.054	0.152	**<0.001**

***p*-value which is in bold showed significant differences (p<0.05).**

The average attitude scoring among the participants were recorded at 20.16 ± 2.674, which was at the average level, thus it showed that the participants consists of a relatively satisfied attitude towards NSAID usage.

Practice

According to Table 6, 59 of the participants (15.5%; n=380) had taken less than or more than the recommended dose of NSAID, and 24 out of the 59 participants(40.68%) were current users of NSAID.

Table 6: Participants' Practice towards NSAID

QN	Statement	Yes (%) (n=380)	User (n=52)	Non-User (n=328)

1.	**Have you ever taken less than or more than the recommended dose of NSAID medicine?**	59 (15.5)	24 (46.2)	35 (10.7)
2.	**Have you ever taken the next dose of NSAID medicine sooner than directed on the label?**	47 (12.4)	19 (36.5)	28 (8.5)
3.	**Have you ever taken more than the number of dosages for NSAID medicine per day as directed?**	32 (8.4)	11 (21.2)	21 (6.4)
4.	**Have you ever shared NSAID medicine with others who have similar illness?**	86 (22.6)	27 (51.9)	59 (18.0)
5.	**Have you ever taken NSAID medicine according to suggestions from people other than healthcare professionals (i.e. doctors, pharmacists)?**	133 (35.0)	34 (65.4)	99 (30.2)

6.	**Have you ever reused doctor's prescription when you get similar complaints?**	120 (31.6)	24 (46.2)	96 (29.3)
7.	**When your symptoms are relieved, do you discontinue NSAID medicine by yourself?**	174 (45.8)	41 (78.8)	133 (40.5)
8.	**Have you ever taken NSAID medicine according to suggestions from people other than healthcare professionals (i.e. doctors, pharmacists)?**	133 (35.0)	34 (65.4)	99 (30.2)

*** QN indicates the question number.**

***Data reported in brackets represents the percentage (%).**

Based on the result obtained shown in Table 7, there was no significant difference between the genders relating to their practice of NSAID usage.

Table 7: *p*-value for each variable in practice section.

QN	*p*-value *

	Gender	Nationality	Ethnicity	Education Stream	Users
1.	0.908	0.512	**<0.001**	0.828	**<0.001**
2.	0.182	0.632	**0.016**	0.930	**<0.001**
3.	0.407	0.008	**0.003**	0.057	**<0.001**
4.	0.109	0.531	**<0.001**	**0.022**	**<0.001**
5.	0.356	0.798	**0.020**	0.939	**<0.001**
6.	0.822	**0.046**	**0.039**	0.609	**0.015**
7.	0.585	0.381	**0.010**	0.089	**<0.001**

***p*-value which is in bold showed significant differences (p<0.05).**

A minor significant difference had been found between the nationality, relating to the reuse of old prescription when the participant re-experienced the similar symptoms and among the education stream where relating to the sharing of NSAID medication with others who had similar illness. Moving on to the users' group and ethnicity, there was a significant difference in their practice of NSAID usage where all the questions relating to the practice behaviour showed a significant difference ($p<0.05$).

Sources of information

Table 8: Sources of information relating to NSAID

Source	No. of participants (n=380)	User (n=52)	Non-User (n=328)	*p*-value *
Media (i.e., radio, newspaper etc.) and textbooks	83 (21.8)	9 (17.3)	74 (22.6)	0.394
Internet	154 (40.5)	19 (36.5)	135 (41.2)	0.528
Professional parties (i.e., doctors, pharmacists etc.)	187 (49.2)	43 (82.7)	144 (43.9)	**<0.001**
Others	57 (15.0)	8 (15.4)	49 (14.9)	0.933

***p* value in bold showed significant association with the variable**

***Data reported in brackets represents the percentage (%).**

Reason(s) to practice self-medication of Non-Steroidal Anti-Inflammatory Drugs

Table 9: Reason(s) to practice self-medication of NSAID among participants.

Reason	No. of participants (n=380)	User (n=52)	Non-User (n=328)	*p*-value*
The symptoms will subside soon after consumption of NSAID	94 (24.7)	21 (40.4)	73 (22.3)	**0.005**
Prior experience	94 (24.7)	20 (38.5)	74 (22.6)	**0.014**
Lack of time to consult doctor	131 (34.5)	16 (30.8)	115 (35.1)	0.545
Recommendation from family/friends/Internet	158 (41.6)	28 (53.8)	130 (39.6)	0.053
Cost effectiveness	81 (21.3)	13 (25.0)	68 (20.7)	0.485
Others	25 (6.6)	0 (0.0)	25 (7.6)	**0.039**

***p*-value in bold showed significant association with the variable**

***Data reported in brackets represents the percentage (%).**

Discussion

Paracetamol is the most common over-the-counter analgesic where it can be purchased everywhere, even in the convenient shops. On the other hand, NSAID is categorized as prescribed medicine, where its usage is rising among the public due to the stronger analgesic effect compared to paracetamol[17]. This study targeted only on first-year non-health science undergraduates who were from the universities in Klang Valley, Malaysia and minority of the participants were International students (refer to Table 1).

Female participants were recorded higher than the male participants, regardless of the category of users or non-users of NSAID. This result had matched with a few studies where the female participants were dominating in their study results[7,18,19]. An explanation on this behaviour was due to factors such as stress and period pain[20]. However, all the variables that were recorded, such as the gender, nationality, ethnicity and education stream were not equally distributed as the results obtained were more dominating in one of the variables compared to the other

variables due to the convenient sampling method used during the study's survey period.

Knowledge

Participants showed relatively low knowledge level regarding NSAID where more than half of the participants scored 2 points and below out of the total points of 7 in the knowledge section of the questionnaire. This result was in accordance with the study done among the public in Rawalpindi and Islamabad, Pakistan as well as among the undergraduates in Poland where even the health-science undergraduates who had learnt about NSAID in their studies had low knowledge in this group of medication, in support with other students from different fields of study[12,21] It had further been supported by a study among physiotherapists, a registered healthcare profession, and the result also showed that they had low knowledge on NSAID as well[22]. When the result was subjected for comparison between the users and non-users, it showed significant differences between these two groups where all the *p*-values for each question were below 0.05, except for the question related to the

low-dose aspirin's effect. Users showed to have better knowledge on NSAID compared to the non-users group. This might due to users' experiences were still new and intact as they used NSAID during the past 12 months compared to non-users who have used it more than 12 months ago or totally not being exposed to NSAID beforehand. One of the reasons behind this might be due to patient who had exposed to the medications not long ago tends to remember its usage and information clearer compared to those who had used it long ago, however study should be done on this assumption to understand the reliability on it. Next, to evaluate their knowledge on this question, we had further asked those who had answered correctly, to specify which NSAID contain this effect and they managed to answer it correctly, which is aspirin, but they were unaware on the dose which causes this effect. Upon further questioning, it was noted that the source of this information was either from their health-science friends or seniors, the family members who were exposed to it as well as from the Internet sources. As per result obtained, it was noted that

there was a significant association between the ethnicity group in most of the questions in knowledge section.[23]

Attitude

Most of the participants showed neutral responses on their attitude towards NSAID and no favouritism towards NSAID usage in this study. Most of the participants were unsure of the harmful effects of NSAID when it was taken for long period, and when matching it with the additional supporting evidence in the knowledge section, where the rate of correct answer on the side effects of NSAID were less than half of the whole studied populations obtained in this study. This further supported the reason that up to 37.6% of the participants showed neutral response on this statement. However, up to 36.6% of participants agreed on the availability of harmful effects brought by long term usage of NSAID, which in accordance with an article review done in 2015[24]. Next, most of the NSAIDs are to be taken when necessary upon pain and can be stopped when the symptoms are relieved thus it is unnecessarily for the patients to complete the whole course when there is no indication of pain

relieve[25]. Unfortunately, more than half of the participants felt neutral on this statement. This might due to the participants' symptoms may not been relieved even though they had completed the whole course of NSAID or they had been asked to complete the full course of NSAID due to the seriousness of the injuries. Besides that, up to 39.8% of participants had neutral opinions on the pharmacists being the best source of information on NSAID. This was in accordance with study done in New Zealand where most of the respondents would seek information from other professional parties which including through a pharmacist[26]. Moving on to the medication leaflet, participants felt neutral on the process of studying the medication leaflet before the consumption of NSAID and a few reasons can be explained on this result. Firstly, some NSAID that had been prescribed might not be included with its medication leaflet during the dispensing process and second, some participants did not understand the jargons being used in the medication leaflet as they had not been exposed with the medical jargons. However, it showed differently in the study done on first-year medical

students in Bahrain where up to 71.6% of the respondent read the package insert before consuming of the medication[27]. Regarding the availability of NSAID in pharmacy without any prescription, participants showed neutral response as most of the pharmacy will be dispensing NSAID regardless the availability of prescription upon request as NSAID is categorised as a Poison C drug which can be purchased without any prescription through the pharmacist in the pharmacy[2]. Therefore, it was in accordance with the result obtained as the participants were unaware on this issue yet able to purchase NSAID upon request in the community pharmacy. There are different types of analgesic available in the market, which including the traditional remedies as well as the over-the-counter analgesic, paracetamol. Participants believed that any analgesic works equally well for them, thus they showed a neutral response for NSAID being the most effective analgesic. This result was in accordance with a study among teachers in a university in Pakistan, where the most common analgesic being prescribed or used by the public is paracetamol, followed by NSAID[28]. Moving on to the undergraduates' perspective, there

are some of them would choose traditional regime such as Ayurveda as their choice of analgesic[24,29]

Practice

Based on the result obtained, most of the participants showed a satisfactory level of practice on NSAID. This was not in accordance with most of the studies where their results showed the participants had unsatisfied level of practice on NSAID where they favour the self-medicating practice without knowing the appropriate medication to be used nor the actual dose to be consumed[13,19,30]. This might due to the participants were non-health science based where they had not been exposed to the usage of NSAID unless they were previously being exposed to as part of their daily needs for analgesic purpose. However, in the study done among general public in Malaysia, it was reported that majority of the participants complied with the medication regimen which portraited a good practice phenomenon as similarly with our study's result. They further explained that the participants were aware of the dangerous of self-medicating without any doctor's advice or prescription, thus resulting on the

medication adherence pattern[15]. Among the practice questions, the most common bad practice being maintained was reusing of the medication according to the suggestions from people other than the healthcare professionals. This phenomenon had also been noticedamong the recreationally trained college-aged students in 2014 where majority of the participants would take in other's suggestions on the medication, especially when they showed similar symptoms[8]. Another similar result was obtained from the study done in Penang, Malaysia on 2014 where the participants did obtain the medicines based on others' suggestions directly from the community pharmacy. Another common practice by the participants was reusing their old prescription or leftover medication during the remission of the similar pain. This was noted in the study among the public in Malaysia during 2016 where the participant with non-chronic diseases would reuse the old medication for similar illness. However, within the same study, for participants who suffered from chronic diseases, they would rather get the new medications as they believed new medications will be more effective[15]. On

the other hand, the result on discontinuation of NSAID was in tie with the result obtained in the attitude section, where the participants would discontinue NSAID and did not complete the full course of NSAID upon relieve of their symptoms. This indicated that the participants were aware on the proper usage of NSAID but so do the reason of the common practice of public to not finish the whole course of medication once their symptoms had been relieved. This phenomenon was noted as well in the study done in Egypt on self-medication practices where the respondents would stop taking in the required medication once the symptoms had subsided (63.3%)[31].

Source of Information and Reason to Practice NSAID

To understand more on the sources of information on NSAID retrieved by the participants, it was noticed that the sources were in accordance with a study done in New Zealand and Taif Kingdom of Saudi Arabia where the most common source was from the professional parties such as doctors and pharmacists[26,32]. The studies also showed that participants get to know NSAID during the dispensing process upon their visit to

the clinic or community pharmacy, looking for analgesic. Furthermore, there is another study showing that the public managed to get the information on medication due to the advice from the physician, nurses (13.4%) and pharmacists (25.6%)[33,34]. Besides that, some participants mentioned that they get to know NSAID's existence through the widely used Internet which supported by a study in Saudi Arabia and Indiawhere up to 69.1% and 55.18% respectively of the participants in that study got the information from electronic and print media advertisement[7,35]. Other source of NSAID information includes the recommendation from their friends and family which similar to the result obtained from a study on Iranian University student in central Iran. It showed that recommendation from the friends and family being the commonest sources to obtain the information on medication, including NSAID group (54.7%)[36].

Moving on to the reason for self-medication using NSAID, the result showed that recommendation from their friends and family members being the top reason for self-medication practice, which was supported by the result in the

study done on basic science undergraduate medical students in western Nepal[10]. Lack of time to consult doctor ranked the second top reason in this study, however it was the top reason for medical, pharmacy and nursing student in Karnataka to practice NSAID (86.54%). It further explained that due to the long waiting time in the clinic made the respondent to give up on consultation and seek for help in the community pharmacies. Besides that, their previous exposures towards NSAID usage and the belief of their symptoms were too trivial for consultation further encouraged the participants to take NSAID without any consultation[37]. It was reported similarly in the study done in Saudi Arabia and further supported by the study done in Penang, Malaysia[15,38]. Some participants did agree that the self-medication with NSAID can help to reduce cost especially on the consultation fees, which was also found similarly in the studies done in Romania and Saudi Arabia[38,39]. However, on the other hand, there were still a minority of the participant in this study mentioned that they did not practice self-medication of NSAID at all. Overall, recommendation from family and friends, lack of

time for consultation, prior experience with NSAID, belief of the minor symptoms of their illness and the cost effectiveness issues remain the mainstay of the reason for self-medication practice among the public.

Recommendation of Study

There is limited research studies done on the non-health science undergraduates in Malaysia, and since this research only targeting the undergraduates within Klang Valley, Malaysia, it is recommended to do more studies on the same populations in various areas of Malaysia to understand and assess the level of knowledge, attitude and practice of NSAID among this population more accurately.

Conclusion

In conclusion, the first-year non-health science undergraduates in Klang Valley, Malaysia portrait a lacking in their knowledge on NSAID, however they showed a relatively satisfying attitude and a good practice pattern towards this group of analgesic. However, it is still a major concern where the rate

of self-medicating with NSAID is increasing among the undergraduates despite the lack of knowledge due to the numerous reasons issued in this study. This will further become an alarming issue as it might result in harmful adverse reactions among the users. Another major finding in this study was that it showed a significant association between the level of knowledge, attitude and practice towards NSAID among the users and non-users of this group of medication. It showed that users will have a better knowledge level, relatively similar in the attitude level but poor practice pattern towards NSAID when compared with the non-users.

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