

Kent Academic Repository

Full text document (pdf)

Citation for published version

Jarernsiripornkul, Narumol and Phueanpinit, Pacharaporn and Pongwecharak, Juraporn and Krska, Janet (2019) Practices of healthcare professionals in communicating with nonsteroidal anti-inflammatory drug users in Thailand: a qualitative study. *International Journal of Pharmacy Practice*. ISSN 0961-7671.

DOI

<https://doi.org/10.1111/ijpp.12538>

Link to record in KAR

<https://kar.kent.ac.uk/73204/>

Document Version

Author's Accepted Manuscript

Copyright & reuse

Content in the Kent Academic Repository is made available for research purposes. Unless otherwise stated all content is protected by copyright and in the absence of an open licence (eg Creative Commons), permissions for further reuse of content should be sought from the publisher, author or other copyright holder.

Versions of research

The version in the Kent Academic Repository may differ from the final published version.

Users are advised to check <http://kar.kent.ac.uk> for the status of the paper. **Users should always cite the published version of record.**

Enquiries

For any further enquiries regarding the licence status of this document, please contact:

researchsupport@kent.ac.uk

If you believe this document infringes copyright then please contact the KAR admin team with the take-down information provided at <http://kar.kent.ac.uk/contact.html>

Practices of healthcare professionals in communicating with nonsteroidal anti-inflammatory drug users in Thailand: a qualitative study

Narumol Jarernsiripornkul^a, Pacharaporn Phueanpinit^a, Juraporn Pongwecharak^b, Janet Krska^c

^a Faculty of Pharmaceutical Sciences, Khon Kaen University, Khon Kaen, Thailand.

^b Faculty of Pharmacy, Thammasat University, Pathumthani, Thailand.

^c Medway School of Pharmacy, Universities of Greenwich and Kent, Kent, UK.

Corresponding Author: Narumol Jarernsiripornkul, Department of Clinical Pharmacy, Faculty of Pharmaceutical Sciences, Khon Kaen University, Khon Kaen, 40002, Thailand. narumol@kku.ac.th

This is the author accepted version of a paper published online in the International Journal of Pharmacy Practice 25th March 2019 DOI: 10.1111/ijpp.12538

Abstract

Objective; This study aimed to explore practices among healthcare professionals in nonsteroidal anti-inflammatory drug (NSAID) information provision.

Methods; In-depth interviews were conducted with orthopaedic physicians, hospital and community pharmacists in northeastern Thailand. Ten hospitals and twenty pharmacies in five provinces were purposively selected. Interviews followed a topic guideline, were audio-recorded, transcribed verbatim and analyzed using a framework approach.

Key findings; Fifty-one participants were involved: 13 orthopedic physicians, 20 hospital pharmacists and 18 community pharmacists. Four main themes emerged: general information, safety information, differences between new and regular NSAID users and non-selective and selective NSAID users. Pharmacists mostly provided information on administration and indication. While all three groups informed of adverse effects, this was selective, related to factors including trading, time available, patients' age, and perceived ability to understand. Gastrointestinal adverse effect information was most commonly provided, with other side effects, drug interactions and need to monitor for adverse effects rarely mentioned. Variation was reported in provision of safety information depending on whether patients were using selective or non-selective NSAIDs, and new or long-term users.

Conclusions; The content and frequency of NSAID information provision varied between health professionals. Greater awareness of NSAID risks is essential, therefore strategies to improve information provision to Thai patients are desirable.

Key words: healthcare professionals, Thailand, practice experience, nonsteroidal anti-inflammatory drugs, risk communication, qualitative study

Introduction

Nonsteroidal anti-inflammatory drugs (NSAIDs) are in widespread use for pain and inflammatory conditions. Many are accessible without a prescription, especially in pharmacy settings, where NSAIDs are frequently purchased.^[1-5] However, there are potentially serious long-term risks associated with using NSAIDs, in addition to the well-known side effects, about which those using these medicines should be informed.^[6, 7] Studies in many countries show that awareness of side effects and risks associated with NSAIDs among those who use them is poor.^[1, 3, 4, 8-14] In Thailand, more than in many other countries, this group of drugs is widely available since they can be purchased without prescription from pharmacies, and NSAIDs are extensively used.^[15] Not surprisingly therefore, NSAIDs are consistently reported to the Thai Food and Drug Administration (Thai FDA) as the second most frequent cause of adverse effects.^[16]

Our previous surveys have shown that both hospital pharmacists (HPs) and orthopedic physicians (OPs) in Thailand have positive attitudes towards the provision of information to patients about the risks associated with NSAIDs.^[17, 18] Approximately 75% of OPs and 84% of HPs claimed to provide patients with information about side effects, mainly gastrointestinal problems, and over 80% of both groups saw patient information leaflets (PILs) provided with medicines as appropriate useful sources for improving risk and benefit information. Our community pharmacist (CP) survey found that most claimed to screen patients for factors which could increase NSAID risks when supplying non-selective COX-2 NSAIDs, but did so less often if supplying selective NSAIDs.^[19] They were also less likely to provide information and advice about side effects with supply of selective NSAIDs than for non-selective drugs.^[19] Patients on the other hand have indicated that, while the majority receive information about how to use NSAIDs and their indication, fewer than half report receiving information about side effects and they perceive the risks of NSAIDs as generally

low.^[20] The findings from this survey do however concur with those of health professionals, in that attitudes towards receiving written information in the form of PILs were positive.^[21] Such leaflets are not however widely available in Thailand, despite evidence that they can improve patient knowledge of medicines.^[22] A small survey of PILs for NSAIDs in community pharmacies showed that these are not generally available for locally manufactured generic products.^[23] The majority of leaflets which were available were aimed at prescribers, not patients and none conformed to Thai regulatory requirements.

A US study found that physicians and pharmacists are the information sources regarding NSAID risks that most NSAID users prefer to access,^[24] while almost all Thai patients considered both professional groups had a role to play in providing information about ADRs.^[21] Moreover, studies in the US and Canada show that both play major roles in communicating with patients to improve their awareness of these risks and their recommendations can affect patients' choices in purchasing an NSAID over the counter.^[9,10] Other US studies have found that, in practice, only half of the elderly who were prescribed NSAIDs received counseling from healthcare providers at their last consultation,^[25] and that the majority of healthcare providers only provide some details about medication to patients, with administration being given priority over warnings about adverse effects and risks.^[26] One survey, in Greece, attributed low awareness of possible NSAID risks in patients with comorbidity, especially those at risk of cardiovascular events, to insufficient communication between patients and healthcare professionals.^[14]

However, our surveys of Thai health professionals have identified a range of factors affecting self-reported information provision in addition to the type of NSAID. These include work setting, number of work colleagues, time available for direct patient contact and gender.^[17-19] Our patient survey also found that the duration of NSAID use and age were factors which affected whether or not they had received information about potential side

effects and how to avoid or manage these.^[20] Some of the practices appeared inappropriate in the light of current knowledge of NSAID risks. For example, younger patients reported receiving information more frequently than older patients and intermittent users more than regular users,^[20] while community pharmacists advocated differing management of side effects depending on type of NSAID.^[19] Thus it appears that studies in different countries find that not all important issues about NSAIDs are communicated to all patients, especially risk information, yet no qualitative studies have attempted to gain an insight into why this may be the case. We therefore sought to gain more understanding of the factors which affect the provision of information on these medicines by health professionals.

The aim of this study was to explore decision-making, prioritization and reasons for this in relation to provision of information to patients about the risks of NSAID among orthopedic physicians, hospital pharmacists and community pharmacists, and to assess similarities and differences among these groups.

Methods

Study design and setting

This qualitative research was conducted using in-depth interviews, which were carried out by one researcher over a five-month period (May–August 2015). Simple random sampling was used to select five of the twenty provinces in the northeastern region of Thailand: Kalasin, Khon Kaen, Sakon Nakhon, Surin, and Ubon Ratchathani. The study was approved by the Ethics Committee for Human research, Khon Kaen University. Reference number HE551130. Several levels of healthcare setting exist in Thailand: primary care units, community hospitals, general or secondary hospitals, and tertiary hospitals, while the private sector includes private clinics, private hospitals and pharmacies. Some community pharmacies are accredited by the Pharmacy Council and provide a higher level of services

than non-accredited pharmacies. There are three health insurance programs within the public sector: the Universal Coverage Scheme (UCS), Civil Servants Medical Benefits Scheme (CSMBS), and Social Health Insurance Scheme (SHI). NSAIDs are accessible to patients registered with all three schemes.

Participants

Three groups of healthcare professionals that share responsibility for providing NSAIDs to patients in practice were included to explore their perceived roles in also providing information about NSAIDs: OPs, HPs and CPs. Purposive sampling was used to identify 60 potential participants, 20 in each group. In each province, two hospitals and two community pharmacies were purposively selected, to include in each province, representation of both urban and rural areas, and for community pharmacies a Thai Pharmacy Council accredited and non accredited pharmacy. Community pharmacies which did not supply both non-selective and selective NSAID products, and rural hospitals which had no OPs were excluded. Potential participants were invited to take part and to make an appointment for interview by telephone. We identified the participants by convenient sampling from selected sites. The target recruited healthcare professionals in each site consisted of 2 pharmacists and 2 orthopedic physicians. If a participant could not be recruited from the selected site, another participant at the same site would be approached to achieve the target number. However, if there was only one participant (physician) working at the site, we selected only one participant. A letter was sent to all those who verbally indicated they were willing to participate, confirming the interview appointment.

Interview content

A guideline for the interview was developed to elicit individuals' experiences of providing information about NSAIDs to their patients, to gain insight into the risk information given. The topic guideline was based on literature review and gaps found in previous studies.^[17-19]

The guideline was assessed for face validity by three pharmacists, who confirmed that it represented the study objectives, and any minor problems revised before collecting data. The topics included were: details of NSAID information provided to patients, with emphasis on adverse effects; criteria used for screening and selecting patients for prescribing or supply of NSAIDs; and opinions on provision of NSAID risk information to patients.

Data collection

Face-to-face semi-structured interviews were conducted in Thai language with consented participants, at their place of work, or other location chosen by participants. All were audio-recorded with consent. The researcher recorded reflections on the interviews as field notes immediately after each interview.

Data analysis

All interview records along with the field notes were transcribed in Thai by Researcher 1, and transcripts re-checked for accuracy by researcher 2. Next, the transcripts were translated into English, and the accuracy of translation was checked first by researcher 2, then checked independently by researcher 3. Initially, the data were subjected to framework analysis to develop codes, based on the themes in the interview guideline. Researcher 1 and researcher 2 independently read and generated subthemes from transcripts, and all generated subthemes were discussed and agreed upon. Following this, the emergent sub-themes with new codes were discussed by all researchers. Finally, the data were summarized into overarching themes.

Results

A total of 51 healthcare professionals agreed to participate in the study: 13 OPs (response rate 65%), 20 HPs (100%), ten working mainly in out-patient units and ten in in-patient units, and 18 CPs (90%). Participants' demographic data are summarized in Table 1. More than half of

all participants were female, with both hospital and community pharmacists having a majority of females. In contrast, only two of the 13 physicians were female. Age distribution also differed between the groups, with half of the community pharmacists being under 30 years of age, in contrast to only two of the physicians, and physicians had less work experience than the pharmacists.

(Insert Table 1 here)

Data saturation was achieved after interviewing 11 OPs, 15 HPs and 14 CPs. Interview duration ranged from 30 to 45 minutes. Four main themes emerged from the data: (1) general information about NSAIDs, (2) safety information related to NSAIDs (3) new NSAID users and regular NSAID users, and (4) non-selective NSAID users and selective NSAID users. Information was provided in general about NSAIDs, as well as safety information and that there were differences regarding the information given depending on whether patients were attending their first visit or a follow-up, and the type of NSAID (non-selective NSAIDs or selective COX-2 NSAIDs). The themes and subthemes are described below, with illustrative quotes identified by participant type and number.

Theme 1: General information related to NSAIDs

Under this theme, participants talked about the information they gave to patients concerning the indication for the NSAID, its selection and administration, including duration.

- Subtheme 1: How to take this drug

The majority of both HPs (14) and CPs (15) claimed that they provided general information to patients, but this seemed to be less common practice among OPs (4). Most who did said they did not give special attention to patients receiving NSAIDs, except advice on taking after meals.

“For NSAIDs, I advise patients to take this drug immediately after meals, and I always give additional label on drug package to prevent [them] forgetting directions of use. (HP_001, general hospital)

- **Subtheme 2: How long to take this drug**

Very few participants discussed duration of use (four CPs, three Ops), all of whom advised patients to take the drug short-term and to stop using NSAIDs when symptoms were relieved.

*“I tell patients that they should not take drug every day, or suggest duration of use for them. If their symptoms improve, I will suggest stopping the drug or using *as needed*.”*
(OP_003, community hospital)

- **Subtheme 3: The purpose of this drug**

Clarification of indication was explicitly mentioned by many of the pharmacists and some physicians. Interviewees described explaining about taking the NSAID for relief of pain. However, patients’ misperceptions concerning the drug’s indication were also highlighted.

“I described its use as anti-inflammation. Some patients were confused that it was antibiotic drug, and I had to explain them about correct indication.” (CP_016, non-accredited pharmacy)

- **Subtheme 4: Alternative drugs**

Four of the OPs also discussed how they made decisions about selecting a NSAID for patients, which went beyond patient characteristics, to include their finance, type of insurance and type of hospital.

“At first, I really consider patients' age and severity of pain before evaluating the necessity of using NSAIDs. It also depends on patients' finance.”(OP_008, general hospital)

Theme 2: Safety information related to NSAIDs

- Subtheme 1: Side effects

Most participants talked about providing information about side effects from NSAIDs; 10 OPs, 16 HPs, and 13 CPs. However, three (two CPs and a physician) said they did not provide side effects information to their patients.

“I do not tell side effects of NSAIDs to patients because this is a major trading [issue].

When I tell them this drug has side effects, they will fear and not purchase it.”

(CP_005, accredited pharmacy)

Patient education about potential side effects mainly covered gastrointestinal (GI) side effects, often minimized in hospitals by the use of a proton-pump inhibitor, however, some interviewees mentioned that even this information was not provided to all patients, depending on age, potential for understanding or time.

“I only inform patients about stomach irritation. In hospital, patients are mostly prescribed NSAID with omeprazole. I usually advise all older patients, but not younger adults.” (HP_019, tertiary hospital)

There were seven physicians and two CPs who claimed to highlight potential for renal side effects from NSAIDs to their patients, while three HPs mentioned they did not inform patients about renal side effects, except if patients ask.

“I inform patients about side effects on their kidney, especially in patients with renal disease, elderly, tend to have more underlying disease.” (OP_003, community hospital)

Few in each group said they informed patients about potential cardiovascular (CV) side effects (two OPs, one HP, two CPs). However, the physicians said they only provide this information for selective COX-2 NSAID users.

“If I prescribed celecoxib to patients, I describe information about CV side effects to *them when using in long term.*” (OP_006, community hospital)

Two OPs and two HPs, but no CP, said they inform patients about drug allergy and what to do if it occurs.

“I asked question about allergy history, in addition, I told them “If you have rash, difficult breathing or any allergy symptoms, stop using this drug immediately” (HP_012, general hospital)

- **Subtheme 2: Interactions between drugs**

Only one OP and one CP mentioned discussing the possibility of drug interactions with patients, including duplication of NSAIDs.

“I told them to be careful about other drugs or double-dose of NSAIDs. If they were taking other drugs for pain diseases, I tell them to stop using those drugs.” (OP_006, community hospital)

- **Subtheme 3: Monitoring for side effects**

This was only covered by two CPs, one of whom specified the abnormal symptoms that meant patients should return.

“I informed patients about “If you frequently feel burning sensation in your stomach, you should come back to any community pharmacy to receive gastro-protective drugs” (CP_005, accredited pharmacy)

Theme 3: Differences between new NSAID users and regular NSAID users

Ten of those interviewed said their practice was the same for both patients receiving an NSAID for the first time and those who were regular users. HPs claimed it was difficult to distinguish between these groups, but some OPs also indicated they did not vary the information provided.

“It is similar in providing information in all cases. In prescription of NSAIDs, I advise patients to take drug when they have symptoms and do not take it every day.”

(OP_010, community hospital)

- **Subtheme 1: Amount of information**

In contrast, 15 (eight HPs, four CPs and three OPs) described differences, some indicating that they provided more detailed information for new NSAID users and others that increasing information was given with longer duration of use.

“In patients initially prescribed NSAIDs, I would rather provide them with a lot of information. However, this information was well-known in regular cases.” (HP_002, general hospital)

- **Subtheme 2: Additional information**

One important difference in information provision between new and regular users was mentioned by eight participants (four CPs and four OPs) who said they provided some extra information to continuous users, which they did not give to new users. These covered alternative ways for managing pain and inflammation, and risks to the kidney with long-term use.

“In regular users, I say about long-term use of NSAIDs may affect their kidneys, particularly in patients on long-term treatment with NSAIDs for 1-2 years.” (OP_002, community hospital)

Theme 4: Between non-selective NSAID users and selective NSAID users

Differences in the provision of safety information related to NSAIDs dependent on whether patients received non-selective NSAID users and selective NSAID users was highlighted by many participants, but eleven (six HPs, three CPs and two OPs) said they offer the same information regardless of NSAID type.

“I informed only if this was new drug group or older, ...because mostly customers were not interested in depth of these details.” (CP_001, non-accredited pharmacy)

- **Subtheme 1: Side effects**

Other participants did claim to provide different information, especially for GI side effects, with thirteen (six HPs, two CPs, five OPs) explaining to patients about reduced incidence of GI side effects in selective NSAIDs. This confidence in the reduced potential for problems extended as far as some providing no information.

“When patients were prescribed a new group of NSAIDs, I informed about this drug had lower GI side effects but for safety patients should take it after meals” (HP_005, general hospital)

In contrast, three specifically informed patients about CV problems with selective NSAIDs (two CPs and one OP) and one on renal effects.

“I told openly to them that this drug [celecoxib] had side effect on heart. When I informed them, they feel accepted and well-understood. They were not anxious to discontinue.” (OP_006, community hospital)

- **Subtheme 2: Drug costs**

In addition to information about potential side effects, two CPs also mentioned providing information about drug costs.

“For a new class of NSAIDs, their prices were very high with less side effects. I have to clarify patients about this drug choice. The decision was up to the customer.”
(CP_018, accredited pharmacy)

Discussion

Information communicated to patients using NSAIDS varied between different health professionals, but also depended on type of NSAID and duration of use. Pharmacists in both

hospital and community provided general information on administration and indication, which was consistent with our previous survey of NSAID users, a high proportion of whom reported receiving such information.^[21] However, the present study suggests physicians did not always offer this information, which may contribute to the apparent confusion, mentioned by some pharmacists.

Although most interviewees claimed they informed patients of adverse effects, this was selective, as has been found elsewhere,^[9,11] emphasising GI complications. This was also reflected in our survey of NSAID users, fewer than half of whom recalled receiving information about adverse effects.^[21] Reasons given for providing selected information varied, but included trading, time available, patients' age and their perceived ability to understand. Many did not discuss additional risks with their patients, raising concerns that such information may lead to lower adherence in some patients, which confirmed previous findings from our surveys of Thai HPs and OPs.^[17,18]

While ideally all NSAID users should be informed about all potential adverse effects, realistically this may be difficult in practice. Hence varying the amount of information given to different patient groups may be a useful strategy. Perceptions that too much information could reduce understanding, or affect adherence have been expressed by health professionals in Thailand and elsewhere.^[17,18,27] The health professionals in our study managed potential information overload by providing information on renal and CV risks only to patients requesting this information, or to selected groups, such as the elderly or those with underlying disease. Reserving detailed discussion of less common side effects and longer term risks for regular NSAID users, as was the practice of some participants, also seems reasonable and has been reported elsewhere.^[28]

The practice we found of expounding lower GI side effects with selective NSAIDs while not informing about other issues, and indeed failing to inform patients of potential

adverse effects to influence their purchasing decision, is less justifiable. This is of particular concern for patients receiving healthcare through the UCS and SHI health schemes, who can receive free medicines from the National Essential Medicines List, including non-selective NSAIDs, but not selective NSAIDs, for which they must pay. This practice may lead the public to believe that selective NSAIDs are better and safer to use. Clearly type of NSAID was a factor affecting other aspects of information provision, again confirming some of our survey results.^[19,20] CV side effects were only mentioned by a few participants in relation to selective NSAIDs and not with non-selective drugs, despite similar risks.^[6] The cost of obtaining different NSAIDs, of immediate relevance to purchasers, was an additional aspect of information provision related to type of NSAID, and also affected decisions about selection by OPs and CPs.

Explaining the need to avoid duplicating NSAIDs was mentioned by only two interviewees, despite the potentially dangerous combination of prescription and non-prescription NSAIDs being widespread.^[26] Few interviewees referred to the need to avoid NSAIDs or use them short-term in older people or to exercise caution in patients with risk factors or concomitant drug use which could increase their chances of adverse events.^[3,4,12,13,20,29-31] The potential for acute effects on the kidney^[7] were only discussed in long-term users.

Patients value healthcare professionals as important sources of information, even though in many countries other sources can be easily accessed.^[22,32,33] Although the failure to inform patients in full about risks may reasonably be related to decisions about the quantity of information, when to provide it and its necessity in short term users, there is a need for greater provision. Written information provided with all purchased medicines, as occurs elsewhere, would give all users of NSAIDs accessible risk information, regardless of NSAID type, duration of use or patient characteristics.

This study was limited to five of the 77 provinces in Thailand. The majority of pharmacists in our study were female, in contrast to the physicians, who were mostly male and the age distribution and work experience differed between pharmacists and physicians, most likely due to the time taken to qualify for the latter positions. As with any qualitative study the results cannot be generalized to healthcare practice in Thailand more widely. Moreover, the interviews required participants to generalize their practices and the information they gave was subject to recall bias and could not be verified. Although we were not able to undertake validation of the transcriptions or seek interviewee views on our interpretation, all interviews were reviewed by two researchers and themes discussed by all authors.

Conclusion

The content and frequency of information provision varied between health professionals and was affected by duration and type of NSAID, as well as patient factors. Pharmacists provided general information more than physicians and, while all three groups discussed side effects, they mostly concentrated on GI effects. Important information about potential drug-drug interactions, other adverse effects and how to monitor for these was often overlooked. Greater attention should be paid by all health professions to providing information about NSAID risks to help reduce adverse events. The provision of PILs with medicines could improve available information for patients.

Acknowledgement

The authors would like to thank all physicians and pharmacists who participated in this study.

Funding

This work was supported by Khon Kaen University Integrated Multidisciplinary Research Cluster [grant number MIH-2554-Ph.D-07]; and the Graduate School of Khon Kaen University [grant number 55222103].

Table 1 Participants' demographic data

Demographic variable	Number of participants		
	Orthopedic physicians (N=13)	Hospital pharmacists (N=20)	Community pharmacists (N=18)
Sex			
Female	2	15	12
Male	11	5	6
Age (years)			
≤ 30	2	7	9
31-40	9	9	8
41-50	1	4	0
51-60	1	0	1
Mean (S.D.)	37.31±7.99	32.75±6.45	32.67±7.51
Min-Max	27-60	25-47	26-55
Working area			
Rural areas	6	10	9
Urban areas	7	10	9
Work experience (years)			
≤ 5	2	7	10
6-10	8	6	2
> 10	3	7	6
Mean (S.D.)	10.31±8.43	9.70±6.43	9.11±9.02
Min-Max	1-32	3-24	2-31

References

1. Cuzzolin L, Benoni G. Safety of non-prescription medicines: knowledge and attitudes of Italian pharmacy customers. *Pharm World Sci* 2010;32(1):97-102.
2. Fowler TO et al. Use of nonsteroidal anti-inflammatory drugs in the older adult. *J Am Assoc Nurse Pract* 2014;26(8):414-423.
3. Amirimoghadam P et al. Evaluation and awareness of over the counter use of non-steroidal anti-inflammatory drugs. *J Appl Pharm Sci* 2017; 7(3):154-159.
4. Adams RJet al. Cause for concern in the use of non-steroidal anti-inflammatory medications in the community--a population-based study. *BMC FamPract* 2011; 12:70.
5. Koffeman ARet al. High-risk use of over-the-counter non-steroidal anti-inflammatory drugs: a population-based cross-sectional study. *Br J Gen Pract* 2014;64(621):e191-e198.
6. Trelle S et al. Cardiovascular safety of non-steroidal anti-inflammatory drugs: network meta-analysis. *BMJ* 2011; 342:c7086.
7. Huerta C et al. Nonsteroidal anti-inflammatory drugs and risk of ARF in the general population. *Am J Kidney Dis* 2005;45(3):531-539.
8. Ørnbjerg LM et al. What do patients in rheumatologic care know about the risks of NSAIDs? *J ClinRheumatol* 2008;14(2):69-73.
9. Schmitt MR et al. Communicating non-steroidal anti-inflammatory drug risks: verbal counseling, written medicine information, and patients' risk awareness. *Patient EducCouns* 2011;83(3):391-397.
10. Bower KN et al. What influences seniors' choice of medications for osteoarthritis? Qualitative inquiry. *Can Fam Physician* 2006;52:342-343.

11. Fry RB et al. Racial/ethnic disparities in patient-reported nonsteroidal antiinflammatory drug (NSAID) risk awareness, patient-doctor NSAID risk communication, and NSAID risk behavior. *Arthritis Rheum* 2007; 57(8): 1539-1545.
12. Mullan J et al. Consumer knowledge about over-the-counter NSAIDs: they don't know what they don't know. *Aust N Z J Public Health* 2016; 41(2): 210-214.
13. Rutkaiyte R et al. Patient knowledge of non-steroidal anti-inflammatory drugs use, effects and safety. *Clin Ther* 2017; 39(8): e88-e89.
14. Karakitsiou M et al. Risk perception of NSAIDs in hospitalized patients in Greece. *Bratisl Lek Listy* 2017; 118(7): 427-430.
15. Luanghirun P et al. Prevalence and associated factors of regular nonsteroidal anti-inflammatory drugs used in a rural community, Thailand. *Glob J Health Sci* 2017; 9(9): 58-67.
16. Health Product Vigilance Center (HPVC). Adverse drug reactions reporting 1984-2015. Thai food and drug administration: Ministry of Public Health [online] 2015. http://thaihpvc.fda.moph.go.th/thaihvc/Public/News/uploads/hpvc_5_13_0_100533.pdf. (accessed 28 June 2016).
17. Phueanpinit P et al. Hospital pharmacists' roles and attitudes in providing information on the safety of non-steroidal anti-inflammatory drugs in Thailand. *Int J Clin Pharm* 2014; 36(6): 1205-1212.
18. Phueanpinit P et al. Physicians' communication of risks from non-steroidal anti-inflammatory drugs and attitude towards providing adverse drug reaction information to patients. *J EvalClinPract* 2017; 23(6): 1387-1394.
19. Phueanpinit P et al. Evaluation of community pharmacists' roles in screening and communication of risks about non-steroidal anti-inflammatory drugs in Thailand. *Prim Health Care Res Dev* (accessed 20 April2018, epub ahead of print).

20. Phueanpinit P et al. Knowledge and perceptions of the risks of non-steroidal anti-inflammatory drugs among orthopaedic patients in Thailand. *Int J Clin Pharm* 2016; 38(5): 1269-1276.
21. Jarernsiripornkul N et al. Experiences of and attitudes towards receiving information about non-steroidal anti-inflammatory drugs: a cross-sectional survey of patients in Thailand. *Expert Opin Drug Saf* 2016; 15(4): 417-426.
22. Grime J et al. The role and value of written information for patients about individual medicines: a systematic review. *Health Expect* 2007; 10(3): 286-298.
23. Phueanpinit P et al. Medicine information leaflets for non-steroidal anti-inflammatory drugs in Thailand. *Int J Clin Pharm* 2016; 38(1): 25-29.
24. Houser SH et al. Socio-demographic differences in risk information seeking sources for non-steroidal anti-inflammatory drugs (NSAIDs). *Int J Med Inform* 2016; 94: 222-227.
25. Bear MD et al. Pharmacist Counseling and the Use of Nonsteroidal Anti-Inflammatory Drugs by Older Adults. *Consult Pharm* 2017; 32(3): 161-168.
26. LaCivita C et al. Patient-reported communications with pharmacy staff at community pharmacies: the Alabama NSAID Patient Safety Study, 2005-2007. *J Am Pharm Assoc* (2003) 2009; 49(5): 110-117.
27. Nair K et al. What patients want to know about their medications. Focus group study of patient and clinician perspectives. *Can Fam Physician* 2002; 48: 104-110.
28. Richard C, Lussier MT. Nature and frequency of exchanges on medications during primary care encounters. *Patient Educ Couns* 2006; 64(1-3): 207-216.
29. Varga Z et al. Analysis of non-steroidal anti-inflammatory drug use in hospitalized patients and perception of their risk. *Interdiscip Toxicol* 2013; 6(3): 141-144.

30. Jang SM et al. NSAID-avoidance education in community pharmacies for patients at high risk for acute kidney injury, upstate New York, 2011. *Prev Chronic Dis* 2014; 11: E220.
31. Barkin RL et al. Should nonsteroidal anti-inflammatory drugs (NSAIDs) be prescribed to the older adult? *Drugs Aging* 2010; 27(10): 775-789.
32. Kravitz RL, Bell RA. Media, messages, and medication: strategies to reconcile what patients hear, what they want, and what they need from medications. *BMC Med Inform Decis Mak* 2013; 13(Suppl 3):S5.
33. Houser SH et al. Socio-demographic differences in risk information seeking sources for non-steroidal anti-inflammatory drugs (NSAIDs). *Int J Med Inform* 2016