



Kent Academic Repository

Phueanpinit, Pacharaporn, Pongwecharak, Juraporn, Sumanont, Sermsak, Krska, Janet and Jarernsripornkul, Narumol (2017) *Physicians' communication of risks from non-steroidal anti-inflammatory drugs and attitude towards providing adverse drug reaction information to patients*. *Journal of Evaluation in Clinical Practice*, 23 (6). pp. 1387-1394. ISSN 1356-1294.

Downloaded from

<https://kar.kent.ac.uk/62880/> The University of Kent's Academic Repository KAR

The version of record is available from

<https://doi.org/10.1111/jep.12806>

This document version

Author's Accepted Manuscript

DOI for this version

Licence for this version

UNSPECIFIED

Additional information

Versions of research works

Versions of Record

If this version is the version of record, it is the same as the published version available on the publisher's web site. Cite as the published version.

Author Accepted Manuscripts

If this document is identified as the Author Accepted Manuscript it is the version after peer review but before type setting, copy editing or publisher branding. Cite as Surname, Initial. (Year) 'Title of article'. To be published in *Title of Journal*, Volume and issue numbers [peer-reviewed accepted version]. Available at: DOI or URL (Accessed: date).

Enquiries

If you have questions about this document contact ResearchSupport@kent.ac.uk. Please include the URL of the record in KAR. If you believe that your, or a third party's rights have been compromised through this document please see our [Take Down policy](https://www.kent.ac.uk/guides/kar-the-kent-academic-repository#policies) (available from <https://www.kent.ac.uk/guides/kar-the-kent-academic-repository#policies>).

Physicians' communication of risks from nonsteroidal anti-inflammatory drugs and attitude towards providing adverse drug reaction information to patients

P Phueanpinit,¹ J Pongwecharak,² S Sumanont,³ J Krska,⁴ N Jarernsiripornkul¹

1 – Faculty of Pharmaceutical Sciences, Khon Kaen University, Thailand

2 – Faculty of Pharmacy, Thammasat University, Thailand

3 – Faculty of Medicine, Khon Kaen University, Thailand

4 – Medway School of Pharmacy, Universities of Greenwich and Kent, UK

This is the accepted pre-publication version of the paper published as:

Phueanpinit P, Pongwecharak J, Sumanont S, Krska J, Jarernsiripornkul N. Physicians' communication of risks from non-steroidal anti-inflammatory drugs and attitude towards providing adverse drug reaction information to patients. J Eval Clin Pract. 2017;1–8. <https://doi.org/10.1111/jep.12806>

Abstract

Nonsteroidal anti-inflammatory drugs (NSAIDs) are frequently prescribed for orthopaedic conditions, therefore this study aimed to explore orthopaedic physicians' perceptions of their role in NSAID-risk communication, their attitudes towards the necessity of informing patients about adverse drug reactions (ADR), and factors associated with these. Attitudes were assessed using 17 statements and total scores classed as poor, moderate and good attitude. Self-administered questionnaires were mailed to all 206 orthopaedic physicians working at hospitals in Northeastern Thailand and 66 were returned (32.04%). The responses showed that 75% of physicians claimed to communicate NSAID ADR information, more frequently about gastrointestinal (GI) complications, than about renal and cardiovascular (CVS) complications. ADR management (36%) and monitoring (30%) were not frequently communicated. The time spent with patients was associated with provision of ADR and monitoring advice. Renal function was the risk factor of greatest concern for prescribing any NSAID, followed by history of GI complications, and allergy for non-selective NSAIDs, and history of CVS diseases and age for selective COX-2 NSAIDs. Most physicians (41) had moderate attitude towards providing information and 24 good attitude. Fewer physicians working in tertiary hospitals than general and community hospital physicians considered that time limitations prevented counseling and that patient information leaflets offered easily accessible information. Additionally, more physicians who did not inform patients about ADRs agreed that ADR communication can lead to anxiety and discontinuing treatment. The study indicates that, although orthopaedic physicians had positive attitudes towards providing ADR information to patients, improvement is needed in communicating NSAID risk information.

Key words: orthopaedic physicians, risk communication, nonsteroidal anti-inflammatory drugs, Thailand

1. INTRODUCTION

Communication of potential risks related to treatment is necessary to make patients be aware of concurrent benefits and risks of treatment in shared decision making about their treatment. Thus achieving treatment goals and improving treatment safety may be ensured.^{1,2,3} Moreover, effective treatment risk information delivery also depends on the method of risk information, as this may have an impact on patients' understanding and decision-making.⁴ In practice, there are several aspects to be considered by healthcare professionals when communicating risks of treatment, that is patients' literacy, patients' age, social media/internet access and literacy, pharmaceutical company role and influence, patients' expectations, beliefs and concerns, as well as healthcare professionals' practice and behavior, all of which might affect the quality of risk information transferred to patients.^{1,5} A study found that the quality of consultation could impact on both patients' quality of life and satisfaction,⁶ while a qualitative study suggested that time-limited counseling, physicians' attitudes and communication skills were a potential barrier in providing treatment risk information and ensuring shared decision making with patients.⁷

Several studies have shown that patients need to understand the possible risks including side effects of drugs, and that this information should be more freely shared with patients.⁸⁻¹¹ While majority of patients believe that healthcare professionals are highly-trusted sources of information and decisional support,¹² some health professionals have concerns about the potential negative effects of providing treatment risk information on patients' adherence to the treatment, hence they may avoid providing full information.⁸ Previous studies showed that receiving good information from healthcare professionals^{13,14} and adequate patient–physician communication had a positive impact on patients' awareness about drug risks¹⁵ as well as health outcomes.¹⁶ Nevertheless, studies also confirm that the risks of treatment are not discussed routinely with all patients.^{17,18}

Non-steroidal anti-inflammatory drugs (NSAIDs) are frequently used to manage pain and inflammation in clinical practice. Both their therapeutic and adverse effects are dependent on their ability to inhibit cyclooxygenase (COX) enzymes.¹⁹ The risk of developing adverse effects from NSAIDs depends on patient age, underlying diseases, and concomitant drug use. Healthcare professionals therefore should be more aware of these factors.²⁰⁻²² Despite their common use a previous survey in the United States found NSAID users had poor awareness of NSAID risks, as well as their own risk factors.²³ Patients' perceptions of NSAID risks were relatively low and they often lacked knowledge about the common adverse effects.²⁴ A recent study in Thailand found the majority of hospital pharmacists claimed they provided NSAIDs-related adverse drug reaction (ADR) to patients, but rarely monitored parameters for potential ADRs and less frequent managed potential ADRs.²⁵ Only about 40% of Thai patients taking NSAIDs said that they had received any side effect information, while less than 20% had received information about monitoring and management of these.²⁶ As a prescribers, physicians are one of key healthcare professionals who play an important role in providing medication risk information. Based on risk information of NSAIDs, orthopaedic physicians also have a great potential for prescribing and providing safety information to patients directly. Nevertheless, there are limited studies that focused on Thai physicians' awareness of their role in informing medication risks.

This study aimed to survey hospital orthopaedic physicians' practices in informing patients about NSAIDs adverse effect profiles, and to determine their awareness of the prescribed NSAIDs adverse effect profiles. Additionally, we surveyed the physicians' attitudes towards providing adverse drug reaction (ADR) information to patients and factors associated with them.

2. METHODOLOGY

2.1 Study design and setting

A cross-sectional study was conducted over a period of July to October 2012. The developed questionnaire was mailed to collect data from Thai orthopaedic physicians, who were presently working at hospitals in the North-eastern region.

2.2 Participants

Our participants were orthopaedic physicians who were working at hospitals in Northeastern Thailand, the largest region with the greatest rural population density. In 2012, a total of 206 orthopaedic physicians were listed in the database obtained from The Royal College of Orthopaedic Surgeons of Thailand (From: <http://www.rcost.or.th>). Due to the limited number of physicians, we included all orthopaedic physicians in this survey.

2.3 Questionnaire development

A questionnaire was chosen for data collection. The four main parts of the questionnaire were specifically developed for this target population and covered: demographic data, roles in providing safety information for prescription NSAIDs, awareness of patient factors increasing NSAID risks, attitudes towards the importance of communication about ADRs to patients. If physicians responded that they provided ADR information from NSAIDs and realized patients' risk factors for ADRs from NSAIDs, details of ADRs and the risk factors concerned were collected using multiple response questions, with an additional information section in each question. A 5-point Likert scale was used to measure physicians' attitudes, which had a scale of 5 (strongly agree) to 1 (strongly disagree). The attitude section was composed of 17 statements that focused on three aspects, i.e. need for providing ADR information to patients (statement no. 1-8), providing patient information leaflets (statement no. 9-14), and the roles of pharmaceutical companies in preparing patient information leaflets (PILs) (statements no. 15-17). Content validity of the questionnaire was assessed by three experts (one orthopaedic physician and two pharmacists), the Index of consistency (IOC) was 0.92. Subsequently, the questionnaire was pilot tested with twenty physicians before data collection. Because of limited

number of orthopaedic physicians, physicians working in different departments were invited for pilot study, but these data were not included in the main results. After pilot testing, changes were made to reduce the length of questionnaire and increase the ease of use of some questions.

2.4 Data collection

The developed questionnaires with covering letter and return envelope were distributed by mail to 206 orthopaedic physicians. After sending the questionnaire at 3 weeks, reminder postcards were sent to non-responders. Data were collected between July and October 2012.

2.5 Data analysis

The completed questionnaires were recorded and analyzed by using IBM SPSS for Windows (version 19.0). The score for negative attitude statements were transformed by reverse scoring. The range of total attitudinal scores was 17 to 85, which was divided equally into three parts being classified as poor (17–40), moderate (41–63) and good attitudes (64–85). Respondent demographics, informing patients of ADRs, awareness of patients' risk factors in prescribing NSAIDs, and attitudes were reported as frequencies. The univariate analysis was conducted comparing all demographic data with ADR informing, attitude towards providing ADR information. Then, logistic regression was used to determine factors associated with ADRs informing and level of the physicians' attitude.

2.6 Ethics

The research project was approved by the Khon Kaen University Ethics Committee for Human research, protocol number HE551130.

3. RESULTS

3.1 Response rate

Of the 206 orthopaedic physicians contacted, 66 completed and returned the questionnaire (response rate 32.04%); 51 questionnaires were returned in first response, and another 15 questionnaires after the reminder. Respondent demographics are summarized in Table 1.

(Insert Table 1 here)

The majority of orthopaedic physicians were male (N=61, 92.4%). The mean age of respondents was 38.94 ± 9.46 years (range 24 to 66 years) and 31.8% (N=21) were orthopaedic instructors. The mean work experience was 9.42 ± 8.09 years (range 8 months to 30 years). Half of all respondents (N=38, 55.58%) were working in tertiary hospital, 25.76% (N=17) in general hospital and 16.67% (N=11) in community hospital. Moreover, there was a statistically significant difference between physicians working in different hospitals in term of work position, number of patients seen per day, and the amount of time spent with patients.

3.2 Physicians' communication about NSAIDs

When prescribing NSAIDs, 75% of all respondents (N=48) reported they informed patients about ADR information concerning NSAIDs. However, less than half claimed to provide information on ADR management (N=24, 37.5%) and monitoring (N=19, 29.7%) to patients. For details of ADR information, gastrointestinal risks were those mostly identified as being communicated, such as dyspepsia (N=61, 95.3%), gastrointestinal ulcer (N=54, 84.4%), and gastrointestinal bleeding (N=40, 62.5%). These were followed by renal impairment (N=36, 56.3%), while cardiovascular effects were rarely identified, except high blood pressure (N=10, 15.6%)

A multivariate analysis, illustrated in Table 2, found a statistically significant difference in provision of ADR information. Physicians who spent more than 50% of all working hours in contact with patients were less likely to provide the patients with ADR information (OR_{adj} 0.249, 95%CI 0.074-0.837). Moreover, physicians who spend more than 5 minutes for diagnosis and advising patients were significantly less likely to inform patients about ADR monitoring (OR_{adj} 0.297, 95%CI 0.091-0.968), while physicians who had direct contact with patients more than 50% of all their working hours were more likely to inform about ADR

monitoring (OR_{adj} 3.363, 95% CI 1.033-10.947). However, no significant difference was found in informing about ADR management for all related factors.

(Insert Table 2 here)

3.3 Awareness of patient risk factors to NSAID ADR before prescribing

The physicians reported that diclofenac (60.0%) and ibuprofen (26.7%) were commonly prescribed for patients. In practice, dyspepsia (N=56, 82.6%), high blood pressure (N=44, 72.1%), and renal impairment (N=36, 57.1%) were identified as common adverse effects relating to gastrointestinal, cardiovascular, and renal system, respectively.

(Insert Table 3 here)

The risks of concern when prescribing NSAIDs to patients were divided into non-selective NSAIDs and selective COX-2 NSAIDs. The top five patient risk factors of which the physicians were mostly aware were presented in Table 3. History of renal impairment (N=65, 98.5%), GI ulcer-bleeding (N=63, 95.5%), and allergy to NSAIDs (N=56, 84.8%) were the patient factors that majority of physicians took precaution before prescribing non-selective NSAIDs. For selective COX-2 NSAIDs, history of renal impairment (N=57, 86.4%) was identified by more than 80% of all physicians. Approximately 70% (N=47), and 68% (N=45) were concerned about history of cardiovascular disease and patient age, respectively. In addition, less than half of all physicians identified concomitant drugs, such as aspirin, anticoagulants, antihypertensive drug, corticosteroids, as a risk factor for ADRs from NSAIDs.

3.4 Physicians' attitude towards providing ADR information to patients

There were 65 orthopaedic physicians who answered the attitude part of the questionnaire. More than half of all these physicians had a moderate attitude towards the importance of providing about ADR information to patients (N=41, 63.1%), none of them had a poor attitude, and no statistically significant difference was found in level of attitude between physicians working in different hospitals. The average score of attitude was 61.15 ± 5.30 .

From Table 4, total mean scores of physicians' attitude were not statistically significant different in all type of hospitals, and providing/not providing ADR information. However, there were significant differences ($P<0.05$) in two statements in type of hospitals, and providing/not providing ADR. Most physicians who working in general and community hospitals agreed that ADR communication can be time-consuming (N=26, 96.3%, compared to 73.7% in tertiary hospitals) and patient information leaflets may be easily accessed for ADR information by patients (N=26, 96.3%, compared to 71.1% in tertiary hospitals). Additionally, a high proportion of physicians who claimed not to provide ADR information to patients agreed that ADR communication can cause anxiety (N=11, 68.8% in non-ADR advice group, compared to 34.0% in ADR advice group) and lead to discontinuing treatment in patients (N=10, 62.5% in non-ADR advice group VS 23.4% in ADR advice group).

(Insert Table 4 here)

4. DISCUSSION

When prescribing NSAIDs, the results of our study demonstrated that a history of renal impairment was the first concern for both non-selective NSAIDs (98.5%) and selective COX-2 NSAIDs (86.4%). History of gastrointestinal ulcer/bleeding and NSAID allergy were the second and third concern for nonselective NSAIDs, while history of cardiovascular disease and patient age were the second and third for selective COX-2 NSAIDs. Long-term use of NSAIDs was agreed as a concern in prescribing non-selective NSAIDs (79%) and COX-2 NSAIDs (59%) of physicians, while concomitant use of drugs which have the potential to interact with NSAIDs (such as anticoagulants, corticosteroids, some groups of antihypertensive drugs) were identified as being of concern in fewer than 50% of all physicians. The awareness of risk factors before prescribing is very important in order to minimize adverse effects during treatment. Surveys in Italy have shown that 20% of NSAID users were older age and 18% were long-term use more than 6 months,²⁷ while about 20% of NSAID users were currently using potentially

interacting drugs such as corticosteroids, selective serotonin reuptake inhibitor (SSRI), calcium channel blockers or anticoagulants.²⁸ Lack of protection against NSAID risks was often found in patients with older age, and those taking anticoagulants in the Swedish prescription.²⁹ This finding demonstrates an important problem in Thailand, as many Thai patients have concurrent diseases and often receive treatment from multiple physicians (accessing services in different departments, clinics, or hospitals). Hence, an overview and review of all drugs being used may be difficult in practice, with full information only being available from the patients themselves. In this context, physicians should be more concerned about obtaining information on all concomitant drugs patients are using. Our study suggests that physicians' awareness of risk factors which concern them when prescribing NSAIDs was high, however awareness of risk factors might not always lead to appropriate prescribing if information about concurrent therapy is not obtained.

When focusing on information shared with patients, we found that three in four of all orthopaedic physicians (75%) claimed they provided ADR information related to prescription NSAID to patients, but less frequently provided information about ADR monitoring and management (29.7%, and 37.5%, respectively). A previous study in Thai patients taking NSAIDs reported that 22.1% of them received side effect information from their physicians, but only a small number of patients received monitoring (5.4%) and management information (4.2%).²⁶ The present study found that physicians who had face-to-face contact with patients more than 50% of all working time, thus had greater opportunities to communicate ADR monitoring information, were in fact less likely to provide ADR information about NSAIDs to patients. Additionally, physicians who spend more than 5 minutes with patients tended to provide information about ADR monitoring to patients less often. It seems that ADR monitoring was not viewed as important information to provide to patients, even if physicians had more time for advising patients.

Moreover, provision of NSAID risk information was also still focused on gastrointestinal effects, which approximately 60-90% of all physicians claimed to provide. Although 44 physicians (72.1%) reported high blood pressure was often present in patients taking NSAIDs, only 10 physicians (15.6%) claimed to inform patients about this as a side effect. A previous survey reported approximately 50% of NSAID users received at least one item of risk information from their physicians, with gastrointestinal bleeding, heart attack, high blood pressure, and renal disease were frequently informed around 30-40% of physicians.¹⁵ Additionally, cardiovascular effects can occur with any NSAIDs, not only for selective COX-2 NSAIDs, as well as gastrointestinal effects. Hence, all patients should be informed about the risk information with NSAIDs by physicians before starting treatment, and patients need to perceive this information to weigh the benefits and risks regardless of the class of NSAID prescribed.³⁰

A recent survey in Thai patients and the general public showed that they need to receive information related their drugs, and prefer to get information from their physicians and pharmacists, but that in practice, only 30% of them received ADR information.³¹ In this study, all orthopaedic physicians had moderate or good attitudes towards providing ADR information to patients, however concerns about information causing patients' anxiety and reducing adherence to treatment were higher among physicians who claimed not to provide ADR information. In contrast, our previous studies showed that majority of NSAID users perceived the need to receive ADR information (98%). Moreover, our studies show that receiving ADR information was unlikely to increase their anxiety and encourage discontinuity of treatment.²⁶ Current healthcare is moving towards shared decision making with patients therefore it is very important that two-way communication, including discussions about alternative choices of treatment, presence of risk factors, is practiced which can impact on health outcomes and patient satisfaction.^{32,33} However, this study showed there is a critical point in physician-patient

relationships concerning risk communication, suggesting that the amount of risk communication may not always be balanced with information about potential benefits of treatments.

However, a high proportion of physicians, particularly those working at general and community hospitals, agreed that describing ADRs to patients can be time-consuming, and that a PIL is a suitable information source for patients that they can easily access. In the context of Thailand, small hospitals have fewer specialists which may affected the time available to provide advice to patients, while pharmacists also have a role in providing information about NSAIDs,^{25,26} these medicines are in widespread use both on prescription and non-prescription and safety information needs to be re-enforced. Hence, physician involvement in communicating with patients needs to become more embedded into routine practice, to improve the safety of these drugs.

4.1 Limitations of the study

Our study was conducted in only northeastern region of Thailand, our findings may not be generalized to all orthopaedic physicians in Thailand. Moreover, the response rate of this survey was low (32.0%), while half of all respondents were working in tertiary hospitals because most community hospitals have less number of specialist physicians, and the majority of all physicians were male (92.4%). All data were obtained from self-administered questionnaire therefore there is a strong possibility that social desirability bias may have occurred, and the real provision of risk information in practice was not observed in this study.

5. CONCLUSION

All orthopaedic physicians had moderate to good level of attitudes towards providing ADR information to patients. However, risk information related to NSAIDs was not routinely provided by all orthopaedic physician respondents in our survey. Risk monitoring and

management information was provided less frequently. Better communication about NSAID risks is needed to cover not only gastrointestinal risks, but also cardiovascular and renal risks. Orthopaedic physicians are also required to have greater awareness or consideration of potential patient risk factors for ADRs from NSAIDs before prescribing NSAIDs.

ACKNOWLEDGEMENT

The authors would like to thank all orthopaedic physicians who voluntarily agreed to participate in the study.

REFERENCES

1. Hartigan-Go K. Challenges of drug risk communications in the Philippines. *Drug Saf.* 2012;35(11):995-1004.
2. Fagerlin A, Zikmund-Fisher BJ, Ubel PA. Helping patients decide: ten steps to better risk communication. *J Natl Cancer Inst.* 2011;103(19):1436-1443.
3. Laufs U, Rettig-Ewen V, Böhm M. Strategies to improve drug adherence. *European Heart Journal.* 2011;32: 264–268.
4. Timmermans DR, Ockhuysen-Vermeij CF, Henneman L. Presenting health risk information in different formats: the effect on participants' cognitive and emotional evaluation and decisions. *Patient Educ Couns.* 2008;73(3):443-447.
5. Lewiecki EM. Risk communication and shared decision making in the care of patients with osteoporosis. *J Clin Densitom.* 2010;13(4):335-345.
6. Ong LM, Visser MR, Lammes FB, de Haes JC. Doctor-patient communication and cancer patients' quality of life and satisfaction. *Patient Educ Couns.* 2000;41(2):145-156.
7. Walter FM, Emery JD, Rogers M, Britten N. Women's views of optimal risk communication and decision making in general practice consultations about the menopause and hormone replacement therapy. *Patient Educ Couns.* 2004;53(2):121-128.

8. Nair K, Dolovich L, Cassels A, 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.
9. Ziegler DK, Mosier MC, Buenaver M, Okuyemi K. How much information about adverse effects of medication do patients want from physicians? *Arch Intern Med*. 2001;161(5):706-713.
10. Neame R, Hammond A, Deighton C. Need for information and for involvement in decision making among patients with rheumatoid arthritis: a questionnaire survey. *Arthritis Rheum*. 2005;53(2):249-255.
11. Prinjha S, Chapple A, Herxheimer A, McPherson A. Many people with epilepsy want to know more: a qualitative study. *Fam Pract*. 2005;22(4):435-441.
12. Shea-Budgell MA, Kostaras X, Myhill KP, Hagen NA. Information needs and sources of information for patients during cancer follow-up. *Curr Oncol*. 2014;21(4):165-173.
13. Albuquerque PD, Araújo LZ. Information to the patient with cancer: the oncologist's view. *Rev Assoc Med Bras*. 2011;57(2):144-152.
14. Wilbur K, Al-Okka M, Jumaat E, Eissa N, Elbashir M, Al-Yafei SM. Medication risk communication with cancer patients in a Middle East cancer care setting. *Patient Prefer Adherence*. 2016;10:613-619.
15. Schmitt MR, Miller MJ, Harrison DL, et al. Communicating non-steroidal anti-inflammatory drug risks: verbal counseling, written medicine information, and patients' risk awareness. *Patient Educ Couns*. 2011;83(3):391-397.
16. Arora NK. Interacting with cancer patients: the significance of physicians' communication behavior. *Soc Sci Med*. 2003;57(5):791-806.

17. Thornton RH, Dauer LT, Shuk E, et al. Patient perspectives and preferences for communication of medical imaging risks in a cancer care setting. *Radiology*. 2015;275(2):545-552.
18. McCarthy DM, Cameron KA, Courtney DM, Adams JG, Engel KG. Communication about opioid versus nonopioid analgesics in the emergency department. *J Opioid Manag*. 2015;11(3):229-236.
19. Shah S, Mehta V. Controversies and advances in non-steroidal anti-inflammatory drug (NSAID) analgesia in chronic pain management. *Postgrad Med J*. 2012;88(1036):73-78.
20. Turajane T, Wongbunnak R, Patcharatrakul T, Ratansumawong K, Poigampetch Y, Songpatanasilp T. Gastrointestinal and cardiovascular risk of non-selective NSAIDs and COX-2 inhibitors in elderly patients with knee osteoarthritis. *J Med Assoc Thai*. 2009;92:S19-S26.
21. Bavry AA, Khaliq A, Gong Y, Handberg EM, Cooper-Dehoff RM, Pepine CJ. Harmful effects of NSAIDs among patients with hypertension and coronary artery disease. *Am J Med*. 2011;124(7):614-620.
22. Delaney JA, Opatrny L, Brophy JM, Suissa S. Drug drug interactions between antithrombotic medications and the risk of gastrointestinal bleeding. *CMAJ*. 2007;177(4):347-351.
23. Wilcox CM, Cryer B, Triadafilopoulos G. Patterns of use and public perception of over-the-counter pain relievers: focus on nonsteroidal antiinflammatory drugs. *J Rheumatol*. 2005;32(11):2218-2224.
24. Cullen G, Kelly E, Murray FE. Patients' knowledge of adverse reactions to current medications. *Br J Clin Pharmacol*. 2006;62(2):232-236.

25. Phueanpinit P, Jarernsiripornkul N, Pongwecharak J, Krska J. 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.
26. Jarernsiripornkul N, Phueanpinit P, Pongwecharak J, Krska J. 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.
27. Motola D, Vaccheri A, Silvani MC, et al. Pattern of NSAID use in the Italian general population: a questionnaire-based survey. *Eur J Clin Pharmacol*. 2004;60(10):731-738.
28. Silvani MC, Motola D, Poluzzi E, et al. Gastro-intestinal problems and concomitant medication in NSAID users: additional findings from a questionnaire-based survey in Italy. *Eur J Clin Pharmacol*. 2006;62(3):235-241.
29. Johnell K, Fastbom J. Concomitant use of gastroprotective drugs among elderly NSAID/COX-2 selective inhibitor users: a nationwide register-based study. *Clin Drug Investig*. 2008;28(11):687-695.
30. Tannenbaum H, Bombardier C, Davis P, Russell AS. An evidence-based approach to prescribing nonsteroidal antiinflammatory drugs. Third Canadian Consensus Conference. *J Rheumatol*. 2006;33(1):140-157.
31. Patsuree A, Krska J, Jarernsiripornkul N. Experiences relating to adverse drug reactions in the community: a cross-sectional survey among patients and the general public in Thailand. *Expert Opin Drug Saf*. 2016;15(3):287-295.
32. Lofland JH, Johnson PT, Ingham MP, Rosemas SC, White JC, Ellis L. Shared decision-making for biologic treatment of autoimmune disease: influence on adherence, persistence, satisfaction, and health care costs. *Patient Prefer Adherence*. 2017;11:947-958.

33. Lafata JE, Shay LA, Winship JM. Understanding the influences and impact of patient-clinician communication in cancer care. *Health Expect.* 2017. [Epub ahead of print]

TABLE 1 Respondent demographics

Characteristics	No. of orthopaedic physicians (%)			P-value
	Tertiary Hospital (N=38)	General/ Community Hospital (N=28)	Total (N=66)	
Male	34 (89.5)	27 (96.4)	61 (92.4)	0.385 ^b
Age; mean ± S.D., years (min-max)	37.66±10.26 (24.0-56.0)	40.68±8.12 (31.00-66.00)	38.94±9.46 (24.0-66.0)	0.187 ^c
Work position				
Instructor physician	18 (47.4)	3 (10.7)	21 (31.8)	0.002 ^a
Physician	20 (52.6)	25 (89.3)	45 (68.2)	
Work experiences; mean ±S.D. (min-max),years	9.93±8.92 (0.08-30.0)	8.75±6.95 (1.00-27.00)	9.42±8.09 (0.08-30.00)	0.551 ^c
No. of patients seen per day				
≤ 30cases	15 (39.5)	3 (10.7)	18 (27.3)	0.010 ^a
≥30 cases	23 (60.5)	25 (89.3)	48 (72.7)	
Time spent diagnosis and advising per 1 patient; mean ± S.D. (min-max) , minutes	10.61±7.26 (1.00-30.00)	7.43±3.71 (2.00-15.00)	9.22±6.14 (1.00-30.00)	0.027 ^c
Proportion of time spent in direct patient contact				
≤50% of all working time	23 (60.5)	15 (53.6)	38 (57.6)	0.572 ^a
> 50% of all working time	15 (39.5)	13 (46.4)	28 (42.4)	

^aPearson chi-square, ^bFischer's Exact test, ^cIndependent t-test

TABLE 2 Logistic regression analysis of factors associated with providing information

Factors	No. of the physicians (%)		Adjusted Odds Ratio	95% CI	P-value
	No	Yes			
Providing ADR information^a					
Proportion of time spent in direct patient contact					
≤50% of all working hours	5 (31.2)	31 (64.6)	1		
> 50% of all working hours	11 (68.8)	17 (35.4)	0.249	[0.074,0.837]	0.025
Providing ADR monitoring information^b					
Time spent diagnosis and advice per patient					
≤5 minutes	15 (34.9)	12 (63.2)	1		
>5 minutes	28 (65.1)	7 (36.8)	0.297	0.091,0.968	0.044
Proportion of time spent in direct patient contact					
≤ 50% of all time	29 (64.4)	7 (36.8)	1		
> 50% of all time	16 (35.6)	12 (63.2)	3.363	1.033,10.947	0.044

^a Adjusted for type of hospital, and proportion of time spent in direct patient

^b Adjusted for age, work experience, number of patient with diagnosis per day, time spent diagnosis and advising per patient, and proportion of time spent in direct patient

TABLE 3 The physicians' awareness of patients' risk factors before prescribing NSAIDs

Risk awareness	No. of orthopaedic physician (%)			
	Tertiary hospital (N=38)	General hospital (N=17)	Community hospital (N=11)	Total (N=66)
When prescribing non-selective NSAIDs				
Renal impairment	37 (97.4)	17 (100.0)	11 (100.0)	65 (98.5)
History of GI ulcer/bleeding	35 (92.1)	17 (100.0)	11 (100.0)	63 (95.5)
History of NSAID allergy	32 (84.2)	13 (76.5)	11 (100.0)	56 (84.8)
Use NSAID in long-term	29 (76.3)	14 (82.4)	9 (81.8)	52 (78.8)
Patient age > 60 years	27 (71.1)	14 (82.4)	10 (90.9)	51 (77.3)
When prescribing selective COX-2 NSAIDs				
Renal impairment	34 (89.5)	14 (82.4)	9 (81.8)	57 (86.4)
History of cardiovascular disease	29 (76.3)	12 (70.6)	6 (54.5)	47 (71.2)
Patient age > 60 years	25 (65.8)	14 (82.4)	6 (54.5)	45 (68.2)
History of GI ulcer/bleeding	22 (57.9)	12 (70.6)	8 (72.7)	42 (63.5)
Use NSAID in long-term	23 (60.5)	10 (58.8)	6 (54.5)	39 (59.1)

TABLE 4 Orthopaedic physicians' attitude towards providing ADR information to patients

Statement	Total number in agreement (%)	No. of physicians who agreed (%)		P-value	No. of physicians who agreed (%)		P-value
		Tertiary hospital (N=38)	General/ Community hospital(N=27)		Do not advise ADR(N=16)	Advise ADR(N=47)	
1. Patients increase need to know about ADRs.	61 (93.8)	34 (89.5)	27 (100.0)	0.135 ^b	14 (87.5)	45 (95.7)	0.265 ^b
2. Informing about ADRs may increase anxiety in patients.	27 (41.5)	14 (36.8)	13 (48.1)	0.362 ^a	11 (68.8)	16 (34.0)	0.015^a
3. Physicians should have role in providing ADRs information to patients.	57 (89.1)	34 (91.9)	23 (85.2)	0.443 ^b	12 (80.0)	43 (91.5)	0.345 ^b
4. Information of ADRs may lead to discontinuation of drug by patients.	22 (33.8)	13 (34.2)	9 (33.3)	0.941 ^a	10 (62.5)	11 (23.4)	0.004^a
5. Explanation of ADR information might be time consuming.	54 (83.1)	28 (73.7)	26 (96.3)	0.020^b	15 (93.8)	37 (78.7)	0.263 ^b
6. Pharmacists may have a major role in the providing ADR information to patients.	48 (75.0)	25 (67.6)	23 (85.2)	0.108 ^a	12 (80.0)	35 (74.5)	1.000 ^b
7. ADR Information could not improve patient's confidence for self-reported ADRs.	37 (56.9)	21 (55.3)	16 (59.3)	0.749 ^a	7 (43.8)	30 (63.8)	0.159 ^a
8. There should be a process to improve patient's knowledge about ADRs.	61 (93.8)	35 (92.1)	26 (96.3)	0.636 ^b	15 (93.8)	44 (93.6)	1.000 ^b
9. Beside of drug counseling from health professionals, patients should receive information leaflet to improve knowledge about medicine.	56 (86.2)	34 (89.5)	22 (81.5)	0.472 ^b	14 (87.5)	40 (85.1)	1.000 ^b
10. PILs may decrease patient's adherence to medication.	10 (15.4)	8 (21.1)	2 (7.4)	0.175 ^b	1 (6.3)	8 (17.0)	0.427 ^b
11. PILs are information source helping patients to monitor ADRs and increase confident and accuracy for reporting ADRs	56 (86.2)	32 (84.2)	24 (88.9)	0.742 ^b	13 (81.3)	41 (87.2)	0.681 ^b
12. PILs cannot improve patient's carefulness about using medicine	7 (10.8)	4 (10.5)	3 (11.1)	1.000 ^b	1 (6.3)	6 (12.8)	0.667 ^b
13. PILs can decrease your workload in part of informing patients about ADRs	51 (78.5)	28 (73.7)	23 (85.2)	0.266 ^a	13 (81.3)	37 (78.7)	1.000 ^b
14. Giving PILs to patient may increase your workload	20 (30.8)	15 (39.5)	5 (18.5)	0.071 ^a	7 (43.8)	13 (27.7)	0.232 ^a
15. Pharmaceutical company should provide PILs adequately to all patients.	44 (67.7)	25 (65.8)	19 (70.4)	0.697 ^a	12 (75.0)	30 (63.8)	0.413 ^a
16. PILs are reliable information source for providing risk and benefit data of drugs to patients	53 (82.8)	31 (81.6)	22 (84.6)	1.000 ^b	12 (75.0)	39 (84.8)	0.452 ^b
17. PILs are source of ADR information that patients can easily access to information	53 (81.5)	27 (71.1)	26 (96.3)	0.010^b	13 (81.3)	38 (80.9)	1.000 ^b
Total mean scores	61.15±5.30	60.78±6.35	61.65±3.43	0.488 ^c	59.86±4.70	61.59±5.56	0.260 ^c

^aPearson chi-square, ^bFischer's Exact test, ^cIndependent t-test