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Prescription and over-the-counter pain medication in arthritis: awareness of active ingredients and attitudes to medication borrowing and sharing

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Prescription and over-the-counter pain medication in arthritis: awareness of active ingredients and attitudes to medication borrowing and sharing

Abstract

Background Many Australians with arthritis self-manage their pain with prescription and/or over-the-counter pain medications, containing paracetamol. If taken appropriately, these medications are relatively safe; however, if mismanaged through patients' inability to understand medication labels and instructions, these medications may cause adverse drug events and/or toxicities. **Aim** This study explored the prescription and over-the-counter pain medications most commonly used by people with arthritis and the ability of these patients to correctly identify paracetamol as an active ingredient in commonly available preparations. The study also investigated the functional health literacy of these patients and their inclination to borrow and/or share pain medications. **Method** Adult participants diagnosed with arthritis were invited to complete an anonymous survey which included questions about their prescription and over-the-counter pain medications; their medication borrowing and sharing behaviours; their functional health literacy; and their knowledge about preparations containing paracetamol as an active ingredient. **Results** Most of the 254 participants used analgesic agents containing paracetamol, as combination tablets (paracetamol 500 mg and codeine 30 mg) or paracetamol-only tablets (paracetamol 665 mg) to self-manage their pain. Respondents with low functional health literacy scores were significantly less likely to identify paracetamol as an active ingredient in both combination and paracetamol-only pharmaceutical products, and were more likely to guess or did not know how to identify that paracetamol was an active ingredient in these products. Almost 30% of the respondents indicated that they had and/or intended to borrow/share their over-the-counter pain medications whereas less than 10% suggested that they had and/or intended to borrow/share their prescription pain medication. **Conclusion** Australians with arthritis, especially those with low functional health literacy scores, self-managing their pain with paracetamol-containing products, do not always recognise paracetamol as an active ingredient in combination products, and may risk potential paracetamol-related adverse effects and/or toxicities.

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Abstract

Background

Many Australians with arthritis self-manage their pain with *prescription* and/or *over-the-counter (OTC)* pain medications, containing paracetamol. If taken appropriately, these medications are relatively safe; however if mismanaged through patients' inability to understand medication labels and instructions, these medications may cause adverse drug events and/or toxicities.

Aim

This study explored the *prescription* and *OTC* pain medications most commonly used by people with arthritis and the ability of these patients to correctly identify paracetamol as an active ingredient in commonly available preparations. The study also investigated the functional health literacy of these patients and their inclination to borrow and/or share pain medications.

Method

Adult participants diagnosed with arthritis were invited to complete an anonymous survey which included questions about their *prescription* and *OTC* pain medications; their medication borrowing and sharing behaviours, their functional health literacy and their knowledge about preparations containing paracetamol as an active ingredient.

Results

Most of the 254 participants used analgesic agents containing paracetamol, as combination tablets (paracetamol 500mg and codeine 30mg) or paracetamol-only tablets (paracetamol 665mg) to self-manage their pain. Respondents with low functional health literacy scores were significantly less likely to identify paracetamol as an active ingredient in both

combination and paracetamol-only pharmaceutical products, and we more likely to guess or didn't know how to identify that paracetamol was an active ingredient in these products. Almost 30% of the respondents indicated that they had and/or intended to borrow/share their OTC pain medications whereas less than 10% suggested that they had and/or intended to borrow/share their *prescription* pain medication.

Conclusion

Australians with arthritis, especially those with low functional health literacy scores, self-managing their pain with paracetamol-containing products do not always recognise paracetamol as an active ingredient in combination products, and may risk potential paracetamol-related adverse events and/or toxicities.

Introduction

Arthritis is a widespread chronic health condition characterised by pain, joint inflammation, decreased mobility and discomfort [1] . According to a recent Australian National Health survey, over 3 million Australians are affected by some type of arthritis, the majority being aged 65 years and over [2]. Self-management of pain symptoms using analgesics is common; with paracetamol and non-steroidal anti-inflammatory drugs (NSAIDs) strongly represented in *prescription*-only and over-the-counter (OTC) pain medications [1, 3].

High health literacy equips patients with the knowledge needed to find, interpret and understand health information [4], allowing them to achieve better health outcomes by making informed decisions [5-7]. Thus, people with arthritis who have high health literacy should be able to safely and effectively self-manage their pain medication because, in theory, they are effectively able to find, interpret and understand medication information and instructions. On the other hand, people with arthritis who have low health literacy may risk mismanaging their pain medications because, potentially, they are less likely to correctly identify and follow instructions. Evidence in the literature has identified that patients' inability to identify the active ingredient in both *prescription* [8] and OTC medications [9] can lead to unintentional adverse events because of medication mismanagement.

Previous studies have found that *prescription* pain medications are likely to be borrowed and/or shared more than any other kind of *prescription* medications[10-12]. This may be influenced by the availability of paracetamol and NSAIDs in various OTC preparations and their widespread acceptance as a convenient modality for managing pain [13, 14]. It is possible there is a perception that any pain medication containing those same ingredients, whether available on *prescription*, OTC, or both, is 'safe' to borrow or share. Unfortunately, however, borrowing and sharing behaviour can lead to adverse consequences [15], especially

among people already taking other medications, with undiagnosed sensitivities, or in those who have a chronic illness which contraindicates the use of these medications [16-18].

The aim of this study was to identify the pain medication(s) most commonly used by people with arthritis and the ability of these patients to correctly identify paracetamol as an active ingredient in some commonly-used *prescription* and OTC pain medications. The study also investigated the functional health literacy levels of these people and whether or not they are inclined to borrow and/or share pain medications.

Methods

Following approval from the University of Wollongong Human Research Ethics committee (HE 11/314), a convenience sample of community-dwelling Australians with arthritis (aged over 18 years of age) was invited to take part in the study. A power calculation indicated a response of at least 220 participants was required. Participants diagnosed with arthritis were recruited between November 2011 and April 2012 from Illawarra-based community pharmacies, medical practices and residential aged-care facilities. They were also recruited by advertising the study via municipal council services, the local university of the Third Age group, the Arthritis NSW website and via social media (e.g. Facebook and Twitter). The first author was responsible for participant recruitment. She visited each of the aforementioned sites/organisations, and provided them with copies of the paper-based survey, together with stamped, self-addressed envelopes for the return of the completed surveys. Participants who preferred to submit their responses online were provided with a link to the survey. This link was also made available on the Arthritis NSW website and via the research team's social media sites. The anonymous survey included questions pertaining to the respondent's demographic information; which *prescription* and OTC pain medications they used, and how

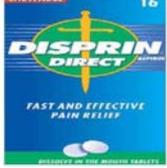
often they used them; their medication borrowing and sharing behaviours (based on a modified version of the prescription medicine borrowing and sharing screening tool [19]); and their functional health literacy scores, based on Ischikawa *et al's* functional health literacy scale [20]. The functional health literacy scale [20] questions included: “In reading instructions or leaflets from hospitals/pharmacies about pain medicine, do you find: (a) the print is too small to read (b) there are words you don't know (c) you need a long time to read and understand them (d) you need some-one to help you read them” The participants were asked to respond to these three questions by choosing one of the following responses: ‘never’ (score=4), ‘rarely’ (score =3), ‘sometimes’ (score =2) or ‘often’ (score =1). The scores for these questions were then summed and divided by four to determine the average functional health literacy score for each respondent. Respondents with average scores below 2 were deemed to have low functional health literacy, participants with scores between 2 and 3 were classified as having adequate functional health literacy and those with scores above 3 were classified as having high functional health literacy. In addition to these questions, the survey participants were asked to identify which of the different *prescription* and OTC preparations included in Figure 1 contain paracetamol as an active ingredient, and how they knew that these preparations contained paracetamol.

There were no exclusion criteria for the study, other than a requirement for participants to be over 18 years of age and diagnosed with arthritis. However, only participants who were able to read the survey questions were able to complete the survey as there was no additional support provided.

Analysis of the data included calculating frequencies for the number of participants taking pain medications, correctly identifying paracetamol as an active ingredient, their functional health literacy scores and their borrowing/sharing behaviours. Chi-square analyses were used to compare borrowing/sharing across high, adequate and low functional health literacy

groups. Differences in ability to correctly identify paracetamol containing medications as a function of their functional health literacy were assessed using multivariate analysis of variance. The IBM SPSS (Version 19) program was used to analyse the data.

Figure 1: Survey question to determine participant knowledge of preparations containing paracetamol as an active ingredient

<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	

Results

Participant Information

In total, 254 surveys were returned although not all questions were answered. The majority of the respondents were female ($n = 181, 71.3\%$), aged 55 years and over ($n = 169, 66.5\%$) and held either a trade certificate/diploma or at least a university degree ($n = 153, 60.2\%$). Almost

three-quarters of the respondents ($n = 184$, 72.4%) had suffered from an arthritic condition for over five years.

Based on the completed responses for the functional health literacy related questions from 237 participants, the majority of them ($n = 142$; 59.9%) had adequate functional health literacy scores; just under a quarter of them ($n = 55$; 23.2%) had high functional health literacy scores and approximately one sixth of them ($n = 40$; 16.9%) had low functional health literacy scores.

Prescription and OTC Pain Medications

Prescription pain medications were taken by 185 (72.8%) participants. The most commonly prescribed pain medications were products containing paracetamol, in particular 500mg paracetamol in combination with codeine 30mg (*i.e. Panadeine Forte™*), and 665mg paracetamol in combination with codeine 30mg (*i.e. Panadol Osteo™*) preparations (Table 1). Cyclo-oxygenase-2 (COX-2) inhibitors, opiates and NSAIDs were also prescribed for many of the study participants (Table 1).

Table 1: *Prescription* Pain Medications taken by 185 of the 254 Study Participants:

<i>Prescription</i> Pain Medication (Number & % of 185 participants taking <i>prescription</i> pain medications)	Total Number of <i>Prescription</i> Pain Medications taken by Participants* (% of total <i>prescription</i> pain medications)
Paracetamol-containing products <ul style="list-style-type: none"> • paracetamol 500mg/codeine 30mgs ($n = 54$, 29.2%) • paracetamol 665mg ($n = 36$, 19.5%) • paracetamol 500mg ($n = 16$, 8.6%) • paracetamol 450mg/codeine 9.75mg-30mg/ doxylamine 5mg ($n = 6$, 3.2%) • paracetamol 325mg & dextropropoxyphene 32.5 mg ($n = 3$, 1.6%) 	115 (46.2%)
Cox-2 inhibitors <ul style="list-style-type: none"> • meloxicam ($n = 32$, 17.3%) • celecoxib ($n = 22$, 11.9%) • etoricoxib ($n = 1$, 0.5%) 	55 (22.1%)
Opiates <ul style="list-style-type: none"> • tramadol ($n = 27$, 14.6%) 	48 (19.3%)

<ul style="list-style-type: none"> oxycodone ($n = 16$, 8.6%) morphine ($n = 3$, 1.6%) hydromorphone ($n = 1$, 0.5%) dextropropoxyphene ($n = 1$, 0.5%) 	
NSAIDs <ul style="list-style-type: none"> diclofenac ($n = 15$, 8.1%) ibuprofen ($n = 2$, 1.1%) ketoprofen ($n = 3$, 1.6%) naproxen ($n = 7$, 3.8%) piroxicam ($n = 1$, 0.5%) 	28 (11.2%)
Other <ul style="list-style-type: none"> pregabalin ($n = 1$, 0.5%) gabapentin ($n = 2$, 1.1%) 	3 (1.2%)
Total Number of Prescribed Medications	249 (100%)

*Note some of the participants reported that they were taking multiple *prescription* medications and 69 participants did not list any *prescription* medications in their responses.

Over-the-counter pain medications were taken by 195 (76.8%) participants, with the majority taking paracetamol-only (665mg or 500mg) preparations (Table 2). A smaller number of participants reported taking OTC NSAIDs and aspirin-containing preparations (Table 2).

Table 2: OTC Pain Medications taken by 195 of the 254 Participants

OTC Pain Medication (Number & % of 195 participants taking OTC pain medications)	Total Number of OTC Pain Medications taken by Participants* (% of total OTCs medications)
Paracetamol-containing products <ul style="list-style-type: none"> paracetamol 665mg ($n = 97$, 49.7%) paracetamol 500mg ($n = 96$, 49.2%) paracetamol 500mg/Codeine 8mg ($n = 16$, 8.2%) paracetamol 500mg/codeine 8mg ($n = 16$, 8.2%) paracetamol 450mg/codeine 9.75mg/doxylamine 5mg ($n = 6$, 3.1%) 	215 (87.4%)
NSAIDs <ul style="list-style-type: none"> diclofenac ($n = 6$, 3.1%) ibuprofen ($n = 22$, 11.3%) ibuprofen/codeine ($n = 1$, 0.5%) 	29 (11.8%)
Aspirin <ul style="list-style-type: none"> aspirin ($n = 2$, 1.0%) 	2 (0.8%)
Total Number of OTC Pain Medications	246 (100%)

*Note some of the participants listed that they were taking multiple OTC pain medications and 59 participants did not list any OTC medications in their responses.

Furthermore, 78 (30.7%) participants responded that they were taking at least two or more preparations containing paracetamol (as either *prescription* and/or OTC medications). An additional 13 (5.1%) participants responded that they were taking at least two or more COX-2 inhibitors and/or NSAIDs combinations (as either *prescription* and/or OTC medications).

Borrowing or Sharing of Pain Medications

Just over 30% of the total participants ($n = 71$, 30.3%) indicated that they had borrowed/shared OTC pain medications within the last three months. However, less than 10% of the total participants ($n = 22$, 8.7%) indicated that they had engaged in the same behaviour with their *prescription* pain medications. While sharing of OTC pain medications was more common than sharing of *prescription* pain medications, there were no significant differences in sharing behaviour related to the functional health literacy of respondents i.e., those with low functional health literacy were equally as likely to have previously shared *prescription* and/or OTC pain medications as those with adequate and high functional health literacy ($\chi^2 (2, N = 234) = 2.708, p=0.258$; $\chi^2 (2, N = 234) = 5.804, p = 0.055$).

Future intention to engage in borrowing/sharing behaviour was also examined. Similarly, a little under 30% of the total participants ($n = 65$, 27.5%) indicated that they would be 'likely' to borrow/share their OTC pain medications within the next three months while less than 10% of the total participants ($n = 19$, 8.0%) indicated that they would be likely to engage in the same behaviour with their *prescription* pain medication. Once again, borrowing/sharing intentions did not differ as a function of their functional health literacy for either *prescription* or OTC pain medications ($\chi^2 (2, N = 234) = 1.306, p = 0.521$; $\chi^2 (2, N = 234) = 2.708, p = 0.258$).

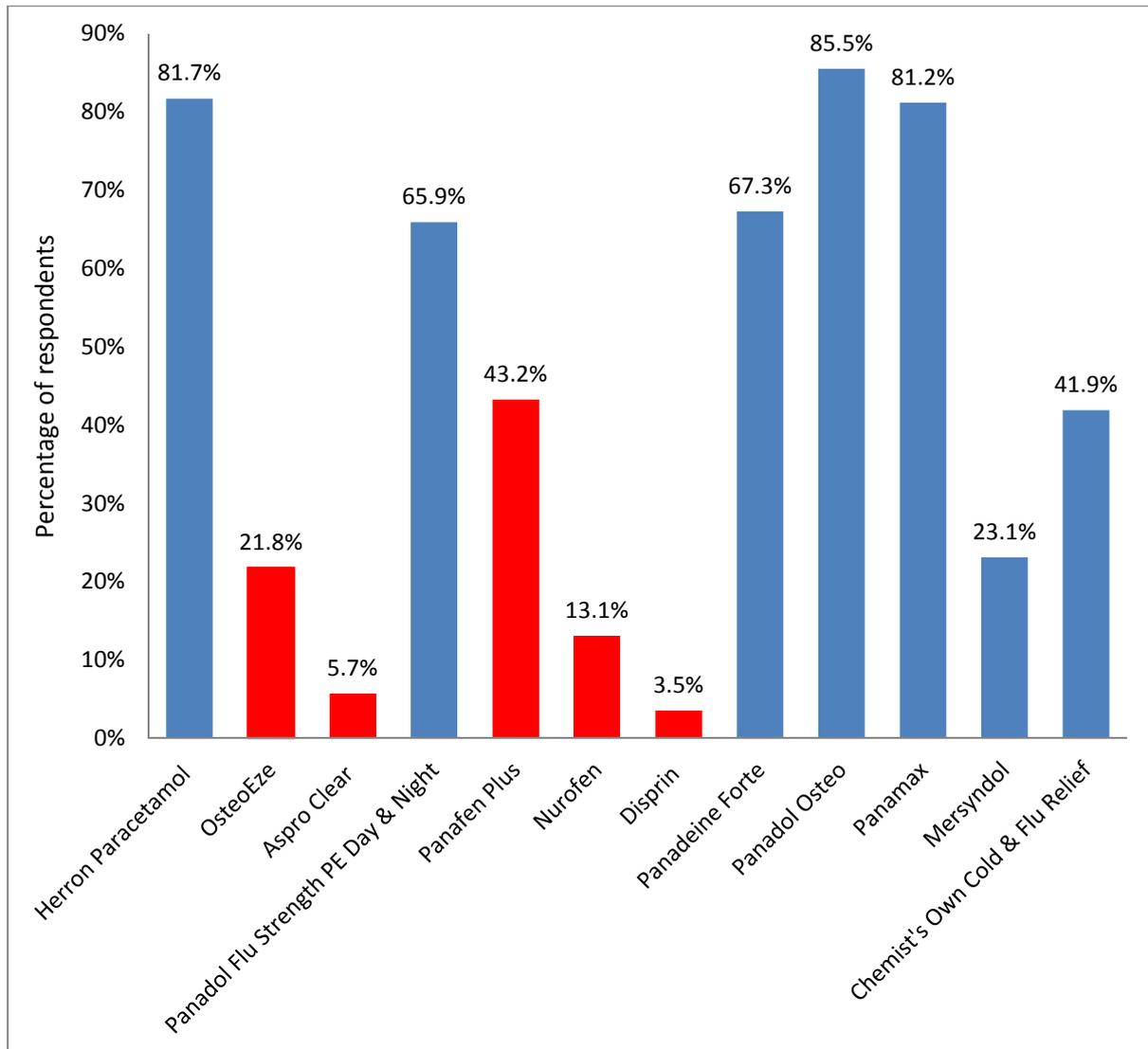
Knowledge of Paracetamol as an active ingredient in both *Prescription* and OTC Medications

Knowledge about paracetamol as an active ingredient in both *prescription* and OTC medications varied among the 229 responses (25 did not respond). More than 80% of these respondents correctly identifying that the *Herron Paracetamol*TM ($n = 187, 81.7\%$), *Panadol Osteo*TM ($n = 196, 85.5\%$) and *Panamax*TM ($n = 186, 81.2\%$) pharmaceutical brands contained paracetamol as an active ingredient (Figure 2). Between 60 and 70% of the respondents correctly identified that some combination pharmaceutical brands, such as *Panadeine Forte*TM ($n = 154, 67.3\%$) and *Panadol Flu Strength PE Day & Night*TM ($n = 151, 65.9\%$) contained paracetamol, whereas fewer than 45% correctly identified that the *Chemist's Own Cold & Flu Relief*TM ($n = 96, 41.9\%$) and *Mersyndol*TM ($n = 53, 23.1\%$) brands contained paracetamol as one of the active ingredients (Figure 2). Furthermore, the large majority of the respondents correctly identified that *Aspro Clear*TM ($n = 216, 94.3\%$), *Disprin*TM ($n = 221, 96.5\%$), *Nurofen*TM ($n = 199, 86.9\%$) and *OsteoEze*TM ($n = 179, 78.1\%$) did not contain paracetamol, while over 43% of the respondents incorrectly identified that *Panafen Plus*TM ($n = 99, 43.2\%$) contained paracetamol as an active ingredient (Figure 2). Notably almost 10% of the participants ($n = 25, 9.8\%$) did not respond to this question.

Multivariate analysis of variance revealed a significant multivariate main effect of functional health literacy on paracetamol identification scores (Wilk's Lambda = .941, $F(4, 466) = 3.545, p = 0.007$). Univariate ANOVAs indicated a non-significant effect of functional health literacy on mis-identification scores ($F(2,234) = .891, p = .625$) but a significant effect for correct identification scores ($F(2,234) = 59.239, p = 0.002$). Games-Howell post-hoc tests revealed that high ($M = 4.46, SD = 2.09$) and adequate ($M = 4.52, SD = 2.13$) functional health literacy respondents correctly identified significantly more paracetamol containing

pain medications than low ($M = 3.21$ $SD = 2.14$) functional health literacy respondents ($p = .013$; $p = .002$).

Figure 2: Responses of 229 participant identifying paracetamol as an active ingredient in different prescription and OTC preparations.



NB: Blue columns represent correct responses and red columns represent incorrect responses. X-axis labels are Trade Mark names.

When asked how they knew which medicines contained paracetamol, of the 154 participants that responded to this question: 59 (38.3%) indicated they had read the labels and/or the

packing; 42 (27.3%) indicated they guessed or didn't know; 30 (19.5%) indicated they had experience with taking them in the past; 19 (12.3%) indicated they had asked a health professional (e.g. pharmacist/doctor/nurse) or were themselves a health professional; and only 4 (2.6%) indicated that they knew because of television advertising. It is also important to note that almost 40% of the participants ($n = 100$, 39.4%) did not respond to this question.

Analysis of their behaviours, with regard to identifying which of the pharmaceutical products contain paracetamol as an active ingredient and their functional health literacy levels, found significant differences for guessing. That is, low functional health literacy score respondents were more likely to have guessed or didn't know which products contained paracetamol (low functional health literacy scores $n = 22$, 55% versus adequate functional health literacy scores $n = 12$, 8.5% versus high functional health literacy scores $n = 8$, 14.6%; $\chi^2(2, N=42) = 7.429$, $p = 0.024$). In contrast, respondents with high functional health literacy scores were significantly more likely to read the labels and/or packaging (high functional health literacy scores $n = 22$, 40% versus adequate functional health literacy scores $n = 26$, 18.3% versus low functional health literacy scores $n = 11$, 27.5%; $\chi^2(2, N = 59) = 6.136$, $p = 0.047$). High functional health literacy score respondents were also more likely to suggest that they knew based on their past experience with using the products (high functional health literacy scores $n = 16$, 29.1% versus adequate functional health literacy scores $n = 13$, 9.5% versus low functional health literacy scores $n = 1$, 2.5%; $\chi^2(2, N=30) = 12.60$, $p = 0.002$).

Discussion

Self-management of medications is important for patients with chronic illness as it can assist in maintaining their quality of life and limit the frequency of visits to their healthcare practitioner. Both *prescription* and OTC medications play an important role in pain

management in many diseases, including various forms of arthritis. The population studied here, typical of the Australian profile of arthritis sufferers[1], was predominantly aged over 55 and had been affected by arthritis for over 5 years. Their age alone would predispose the study participants to co-morbid conditions and the possibility of polypharmacy [21, 22]. This in turn would increase their chances of experiencing adverse drug events, especially if they were taking their pain medications inappropriately [17, 18, 23]. It is imperative that patients have good knowledge about the correct use of medications, an understanding about the active ingredients in different preparations, , and an awareness of possible adverse effects associated with taking several medications, including OTC medications, at the same time. Strategies which could be targeted to improve patient knowledge and understanding, and to reduce the risk of adverse drug events, include improved health care provider education about the active ingredient of both *prescription* and OTC pain medications[17] and improved patient-friendly labelling [17, 24]. In addition, pharmacists have an important role to play in pharmacovigilance of OTC pain medications [25], especially among their patients with low literacy. They also need to be cognisant that patients may have reasonable functional literacy in other areas but may exhibit low functional health literacy in terms of medication self-management.

In this study, most participants used *prescription* and/or OTC analgesic agents containing paracetamol to help manage their arthritic pain, especially *Panadeine Forte*TM (a combination of paracetamol 500mg and codeine 30mg) and *Panadol Osteo*TM (paracetamol 665mg). Even though the majority of respondents with adequate and high functional health literacy scores were able to correctly identify paracetamol as the active ingredient in many commonly available pharmaceutical products, it is important to note that respondents with low functional health literacy scores were significantly less likely to do so correctly. Moreover, respondents with low functional health literacy scores were also significantly more likely to

guess or simply didn't know how to identify which products contained paracetamol as one of the active ingredients. This is of concern, especially for arthritic patients with low functional health literacy who are taking multiple medications containing paracetamol and putting themselves at risk of exceeding recommended daily doses of paracetamol. This potential harm is evidenced by the findings of a recent study [24], which reported that "potential for errors and adverse events associated with unintentional misuse of these products is substantial, particularly among...those with limited literacy" (p.1587). This situation may be further exacerbated in fasting patients, heavy users of alcohol and/or those taking concomitant medications which induce the cytochrome p450 system [26].

The potential for the participants in the current study to experience adverse drug events and unintentional overdose could be further exacerbated by their inclination to borrow or share OTC pain medications. In contrast to reports in the literature suggesting that *prescription* pain medications are likely to be borrowed and shared [10, 11], a larger proportion of our study participants (almost 30%) responded that they had and/or intended to borrow/share their OTC pain medications, rather than their *prescription* pain medications (less than 10%). This is a worrying for all patients, and especially for those with low functional health literacy, who cannot correctly identify the active ingredients in many OTC pain preparations. Furthermore, as suggested by Ward et al [11], many of these patients are unlikely to have discussed this behaviour with their healthcare providers which is why it is important that all healthcare providers educate their patients about the potential harms associated with OTC pain medications, as well as *prescription* pain medications.

In the current study, even though the majority of the study participants had adequate and high functional health literacy scores, the trade names of commonly available pharmaceutical

products may have influenced their perceptions of ingredients. For example, the majority of the respondents did not recognise that paracetamol was an active ingredient in combination pharmaceutical preparations, which did not contain the prefix 'Pana', such as *Mersyndol*TM (76.9%) and *Chemists Own Cold & Flu Relief*TM (58.1%). Furthermore, the majority of the respondents (56.8%) incorrectly identified *Panafen Plus*TM as a product containing paracetamol. Since our results indicate that participants with high functional health literacy scores were significantly more likely to read the labels and/or packaging or were more likely to recognise which products contained paracetamol because of past experience, it could be surmised that respondents with adequate and low functional health literacy scores made up the majority of the respondents who couldn't correctly identify which of these combination products contained paracetamol. Unfortunately, this tendency for many patients to rely on the prefix 'Pana' to identify which products contain paracetamol could also lead to potential adverse drug events and/or toxicities. Using *Panafen Plus*TM as an example, if patients (who had contraindications for the concomitant use of NSAIDs[16, 18, 25] or were already taking multiple NSAIDs) bought or borrowed this OTC pain medication, believing it to contain paracetamol rather than a NSAID, they could be at risk of experiencing NSAID related adverse drug events and/or overdose. This is clearly an area requiring further study and highlights the need for all health professionals, and especially pharmacists, to ensure that all patients know where to find and how to interpret the active ingredients and the instructions for taking both *prescription* and OTC pain medications.

Some limitations of this study need to be acknowledged. The sample population may not be representative of the entire population of people with arthritis, because participants with low functional health literacy skills, including those from CALD backgrounds may not have been able to complete or correctly understand the survey. It is also important to note that even

though the researchers tried to recruit Australia-wide participants, the majority of the participants were Illawarra-based residents.

In conclusion, Australian people with arthritis, especially those with low functional health literacy, who are treating their pain with paracetamol-containing products may not always be able to recognise paracetamol to be an active ingredient in *prescription* and/or OTC pharmaceutical products, thereby inadvertently exposing themselves to potential paracetamol related adverse events and toxicity. Further investigations into this area of research are warranted.

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