A qualitative study to map drug-related problems orthopaedic patients experience within six weeks post discharge

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Abstract

Background Optimal pharmacotherapy is achieved when the following treatment goals are managed: minimal adverse reactions, maximum achievement of the desired effect and maximum patient satisfaction. However, research shows that optimal pharmacotherapy often is not achieved, because of drug-related problems (DRPs) patients experience with their medication use. *Objective* To assess DRPs orthopaedic patients experience within six weeks post discharge, so that patients' pharmaceutical support needs can be mapped *Setting* Orthopaedic department of the Sint Maartenskliniek (SMK) in the Netherlands. *Methods* Adult orthopaedic patients participated in this qualitative study. In May and June 2021 individual interviews were held. Patients were interviewed two times, one week and six weeks post discharge, to map the DRPs patients experience within six weeks post discharge. A semi-structured interview guide is compiled from the TRIAGE and is based on ten domains: knowledge barriers, concerns, necessity, practical intake problems, adverse reactions, complexity of the medication, social support, costs, being able to understand or apply information and problems with incorporating intake in daily routine. *Primary outcome measure* Drug-related problems. *Analysis* Interviews were analysed and coded independently by two different researchers (AL, EM) in EXCEL version 2105 *Results* In total 15 patients were interviewed and 29 interviews were conducted. Five main themes derived from the qualitative data: (I) Insufficient knowledge; many patients were not aware of which medication they take and what adverse reactions their medicines could cause (II) Negative cognition; a lot of patients had a negative view when it comes to medication use. Patients worry about what potential side effects their medication could give (III) Practical barriers; mainly arise with the use of antibiotics and thrombosis prophylaxis (IV) Inadequate drug use; could lead to insufficient effect or drug misuse (V) Negative experience; insufficient effect, prescribed medication caused trouble with comorbidity and adverse reactions. Most DRPs are present with the use of oxycodone and antibiotics. *Conclusion* Orthopaedic patients experience DRPs post discharge. This qualitative study provides insight in which DRPs orthopaedic patients experience post discharge. Patients have difficulty taking their medication adequately due to insufficient knowledge, negative cognition, practical barriers. This may lead to negative experiences with their medication use. Good education about the benefits and risks of medicines is necessary.

Background

The frequency of musculoskeletal diseases has been increasing worldwide for several years and is likely to continue growing in the near future.[1] This also increases the number of orthopaedic surgeries.

Drug therapy plays an important role in the postoperative recovery phase of musculoskeletal diseases. Frequently prescribed postoperative drugs are analgesia (paracetamol, Non-Steroidal Anti-Inflammatory Drugs *NSAIDs* opioids), thrombosis prophylaxis and antibiotics.[2, 3]

Optimal pharmacotherapy is achieved if the following treatment goals are managed: minimal adverse reactions, maximum effect and maximum patient satisfaction.[4, 5] However, research shows that optimal pharmacotherapy is often not achieved, because of drug-related problems (DRPs) patients experience with their medication use.[6, 7] DRPs are events or circumstances involving drug therapy that actually or potentially interfere with desired health outcome and can change over time.[8] Examples of DRPs are adverse reactions, practical intake problems, concerns.[9]

The prevalence of DRPs post discharge varies from 14 to 49 %.[10] Little information is available on which DRPs specifically experienced by orthopaedic patients. Only the study of Haley et al. (2009) examined DRPs during hospital admission in orthopaedic patients who underwent elective total joint arthroplasty of the hip or knee. It was shown that 23,3% of these patients experienced DRPs postoperatively during hospitalization.[11]

However, in the current situation no information is available on which DRPs orthopaedic patients experience post discharge. Since DRPs are one of the stumbling stones in pharmaceutical care, the findings of this study provide pharmaceutical support necessary to achieve optimal pharmacotherapy.

Aim of the study

This qualitative study therefore aims to map which DRPs orthopaedic patients experience within six weeks post discharge.

Ethics Approval

This study is approved by the Peer Review Discussion Board and the Medical Research Ethic Committee (TCC) of the SMK (appendix research proposal).

Methods

This qualitative interview study was conducted at the orthopaedic department of the SMK. The SMK is a leading international hospital in the Netherlands, specialized in the treatment of diseases affecting posture and mobility. Annually, over 8.000 orthopaedic surgeries are performed here.[12] The primary outcome in this study is drug-related problems. Individual interviews were held in May and June 2021. Since, DRPs can change over time, patients were being interviewed two times, one week and six weeks post discharge, to map the DRPs patients experience. This qualitative study is reported according to the Consolidated criteria for reporting qualitative research *COREQ* (appendix).[13]

Study population

Adult patients aged ≥ 18 years were eligible for inclusion if they were prescribed one or more additional medications for home use after hospitalization in the orthopaedic department. All participants were being able to communicate in Dutch. Patients without an overnight stay were being excluded from this study.

Participants inclusion

During hospitalization eligible patients were invited by a researcher (AL) to participate in this study face-to-face. Participants gave written informed consent prior to participation. Patients were enrolled until data saturation occurred (i.e. up to 15 patients). Data saturation occurs when no new information is obtained during the last two interviews. Purposive sampling was performed for patient selection: gender, age, use of drugs prior to admission. All patients who were approached to participate in this study agreed to cooperate.

Data collection

A semi-structured theory based interview guide was compiled from the TRIAGE, which is a useful instrument for starting a conversation at the pharmacy counter with patients about their medication use and is a framework used to identify DRPs patients experience (appendix table 1).[9] These problems concerned knowledge barriers, concerns, necessity, practical intake problems, adverse reactions, complexity of the medication (regime), costs, social support, problems with incorporating intake in daily routine, vulnerable patients who are unable to understand or apply information.[9]

The interview guide in this study (appendix table 2) focussed on identifying DRPs patients experience with additional prescribed medication from the hospital post discharge. This interview guide was pilot tested among a non-participant. Recently, this patient underwent a surgery and was prescribed analgesia (paracetamol and a NSAID). This pilot test was performed mainly to check whether the questions raise ambiguity. As a result from the pilot test the formulation of opening question number 3 has been slightly adjusted (see appendix for the interview guide that is used). A researcher (female, AL), from the Pharmacy (MSc) degree program at Utrecht University, conducts the interviews after following interview skills training. Interviews were conducted over the phone at the SMK. All interviews were audio recorded and transcribed ad verbatim with participants' permission. No field notes were made. All transcripts were returned to participants for comments.

Data analysis

The data obtained from the first two interviews were analysed and coded independently by two different researchers (AL, EM) in EXCEL version 2105. Afterwards, the two researchers discussed the coding to form a preliminary coding scheme. Thereafter, researcher AL analysed and coded all interviews. Afterwards, researcher AL and EM adjusted the coding scheme. This scheme has been discussed with other members of the research group (BJFB, JV) and eventually led to the definitive coding tree (appendix). Also, a member check was performed. During this member check, the participants were asked whether they agreed with descriptions, interpretations and conclusions.

Results

In total, 15 patients participated (mean [SD] 67.9 [9.8] years, 53.3% female) and 29 individual interviews were held with orthopaedic patients that lasted between 5 and 30 minutes. Due to personal circumstances, there was one drop out in week 6. Table 1 shows an overview of the characteristics of the participants and the reason for admission. There is a large variation in number of home medication. Table 2 shows the frequency of the additional prescribed medication for home use at the orthopaedic ward.

Table 1. Characteristics of participants.

	Orthopaedic patients
Gender	Female. 53.3%
Age*	67.9 [9.8]
Number of medicines for home use*	5.1 [± 4]
Reason for admission	Total hip revision (THA) (13.3%) Total hip protheses (THA) (6.7%) Total knee protheses (TKA) (13.3%) Unicompartimental knee protheses (UKA) (13.3%) Osteotomy tibia proximal (13.3%) Admission without undergoing surgery (13.3%) Lumbar dorsolateral fusion (6.7%) Upper extremity : protheses elbow, shoulder (13.3%) Flush infection (6.7%)

* Mean [SD]

Table 2. Frequency of prescribed medication for home use after hospitalization.

PARACETAMOL	NSAIDS	OPIOIDS	ANTIBIOTICS
93.3%	93.3%	93.3%	26.7%

Five main themes were derived from the data: (1) insufficient knowledge, (2) negative cognition, (3) practical barriers, (4) inadequate drug use, (5) negative experience.

Theme I: Insufficient knowledge

Patients indicate to know the indication of the pharmacotherapy and which adverse reactions they could give. Patient find it important to be informed about this. Besides, there is a need to be informed about what to expect from the treatment and the length of therapy. More information is not needed according to them.

"It is important to know what the drug is for, which side effects it may give and what to expect from the therapy duration" (male, 59 years)

However, this study shows that many patients were not aware of which medication they take and what adverse reactions their medicines could cause.

The majority of patients blindly trust the prescribing physician and information folders are therefore not read at all. Also, some patients were not informed adequately.

"I do not think anyone wants to delve into the medication they take after surgery. You are satisfied when the pain is under control. At that point, doctors have your best interests at heart. I take my meds properly" (female, 55 years)

"When you just got out of the hospital, you do not read all the information. You are still half sedated.{…} It is also more helpful if it is explained more clearly." (female, 74 years)

In addition, there is a lack of understanding among the minority of patients.

"I do not know if I have had an anti-inflammatory drug. Did I?" (female, 66 years)

Insufficient knowledge of drug use is mainly reflected in the use of antibiotics and NSAIDs. Patients often confuse these drugs. Several patients think that treatment with an NSAID should be completed, because it is a course of treatment. This leads to incorrect drug use.

"I finished that cure." (male, 59 years)

Prominently, some of the patients were unable to find a source of information. For example, reliable online information platforms or information brochures were not consulted. Besides, some patients did not know who to turn to with questions about their medication.

"I did not know it was possible to contact a specialist." (female, 66 years)

Theme II: Negative cognition

Initially, patients respond positively to the fact that they have been prescribed medication from the hospital after surgery. Especially when it comes to pain medication. Patients indicate it is important to control pain and that pain control has a big influence on their healing process.

"I think it is important to get medicines from the hospital. Especially when it comes to pain medication." (male, 76 years)

"I think it is nice medication is prescribed. When you are in pain, you become restless. This may cause mental health issues. I do not think the healing process will be promoted when you are in pain." (male, 58 years)

When discussed in more depth, a lot of patients have a negative view when it comes to medication use. Practice shows that patients do not take their medication when there is no necessity according to them. Namely, patients worry about the potential side effects drugs could give. Additionally, information

about potential side effects is fearsome for some patients.

"The sun should be avoided during treatment with rifampicin. This results in patients having to wear a cap or apply sunscreen before going outside. So, basically it is a powerful drug." (female, 77 years)

"Rifampicin is such a horrible drug. I must try to persevere as long as possible." (female, 83 years)

"I always find those leaflets…Sometimes you just get worried about all those side effects. Sometimes I do not need to know them. I just read how to take it. Not all possible side effects." (female, 83 years)

Remarkably, patients have developed resistance to the use of oxycodone. The majority of the patients associate this drug with a negative cognition.

"I am not in pain, so if it is not necessary I am not going to take those heavy drugs. It is an opiate and it is still not good for your health." (male, 69 years)

"It is a heavy drug, If it is not necessary I do not take it." (female, 83 years)

The environment also influences the medication use of patients. In all cases, the environment stimulates to use less or to discontinue medication use.

"My physical therapist told me oxycodone could give you a euphoric feeling and make you feel drowsy. Well, that is correct! You are not yourself and the people around me saw that. I think that is horrible, of course. So, I tapered oxycodone." (female, 74 years)

Theme III: Practical barriers

Practical problems mainly arise with the use of antibiotics and thrombosis prophylaxis. Both are prescribed for a longer period of time. In most cases, the treatment duration with an antibiotic is for about three months. Patients find this very long. They are relieved when they can stop the treatment.

"After three months I am glad to stop the treatment with antibiotics. I do not know; it still is junk." (female, 77 years)

In some cases, multiple antibiotics are prescribed, which means that patients have to take a large amount of pills. Furthermore, the absorption of some antibiotics is negatively affected when food (calcium and iron salts) is taken at the same time as the antibiotic. This may result in a complex intake regime. Some of the patients find this very difficult.

"Throughout the day: I have to take 4 pills in the morning and two antibiotics. Then late in the morning, afternoon and evening again. It is quite a lot." (male, 75 years)

"I was prescribed three different antibiotics: Linezolid, ciprofloxacin and rifampicin. That is quite a lot. One hour before the meal I have to take rifampicin first. Then I can eat something and I can take the linezolid and ciprofloxacin. But I am not allowed to take any dairy products like cheese or yoghurt. It is unfortunate because I like that the most." (female, 83 years)

The administration of thrombosis prophylaxis is also a practical problem. Patients point out that the dosage form is not user friendly. Patients experienced pain at the puncture site and a minority was afraid of needles. Besides, for some of them it was difficult to remove the rubber cap from the syringe, because it was too tight.

"It is hard to get the rubber cap off." (female, 75 years)

"When the thrombosis prophylaxis is administered. The puncture site still hurts for an hour afterwards." (male, 75 years)

"I cannot inject myself. I do not think of it. I have had this since childhood." (female, 68 years)

Another problem is that prescribed medication is not always aligned with home medication. This was seen several times with oxycodone and tramadol. As a result, patients do not use the oxycodone at all. This leads to spillage of medication. Reasons not to use oxycodone are that patients are familiar with their home medication and that they are in possession of a repeat prescription.

"Before my surgery I already took pain killers, because of my worn hip I was using paracetamol and tramadol. After my surgery I continued using them. So, I did not even take oxycodone." (male, 69 years)

Theme IV: Inadequate drug use

Patients have found different ways to take their medication at the right time. As a tool an alarm is set on the phone or patients made a list with a medication schedule as a reminder. Nevertheless, a small proportion of patients forget to take their medication. Besides, not all patients rely on medication, therefore they take too little. Inadequate drug use in this way could lead to insufficient effect of the drugs.

"I am wondering if this drug helps. I do not take this medication quickly, because I forget it and I just do not feel like it." (female, 68 years)

Most DRPs with the use of medication was seen with antibiotics, NSAIDs and oxycodone. Strikingly, the majority of the patients who were prescribed an antibiotic take their medication simultaneously with food. Most patients are not aware of the fact that food can affect the absorption of some antibiotics negatively.

"It does not matter. In the morning I eat a sandwich and after that I take my antibiotic." (male, 75 years)

Although, patients suggest that the use of NSAIDs is going well, practice shows inadequate use with NSAIDs. Patients were prescribed a NSAID for two weeks, from which the last seven pills needed to be used based on pain. However, the majority of patients think this was a treatment course of fourteen days that they had to complete. This led to unnecessary medication use.

"Etoricoxib is a fourteen-day course. When those days have passed, I can stop." (male, 69 years)

Oxycodone use should be tapered to avoid withdrawal symptoms. However, most patients do not adhere to the correct phase-out schedule, because they are not aware that there is a phase-out schedule.

Theme V: Negative experience

Negative experience is characterized by insufficient effect of the drug or having side effects. A negative experience is especially seen with the use of oxycodone and antibiotics.

Almost all patients who were prescribed an antibiotic experienced side effects. The most common adverse reactions were gastrointestinal side effects, such as nausea, diarrhoea, loss of appetite. Especially nausea causes problems, as antibiotics often are prescribed for a longer period of time.

"I lost my appetite, I was nauseous, I had an undesirable feeling in my stomach. Well, that nausea… Seeing food made me feel already nauseous. It was horrible!" (female, 77 years)

"I lost my appetite. Since, I have stopped my medication I was not nauseous anymore and I was able to eat. By the way I also had a headache. Let me put it this way, it gave me an undesired feeling. When I think about it, it still makes me sick." (female, 66 years)

Initially, all patients were prescribed oxycodone. In practice, the majority of patients experience side effects of oxycodone, such as nausea, constipation, euphoric feeling. Also, the fear of becoming addicted to oxycodone is a real problem and several patients indicate that they experience insufficient effect of oxycodone. For these reasons many patients stop treatment precociously. This could affect the healing process negatively.

"I have been on oxycodone for a few years. I do not use it anymore. It was hell. Until the moment I die, I do not want to take oxycodone anymore. You see, if I was not mentally addicted, I was physically addicted. It took me a few months to taper off oxycodone. So, this was a reason for me to say: not ever again!" (female, 49 years)

"I have my doubts about the effect of oxycodone. I do not have the feeling it helps, so I do not need them. The pain is not getting any better by taking them." (female, 55 years)

Another problem patients experience is that medication has not been geared to their co-morbidity. As a result, disease condition worsens.

"*I had to discontinue prednisolone use due to interactions with rifampicin. Now my rheumatism has unfortunately worsened."* (female, 77 years)

A conceptual model is shown in figure 1. DRPs are predominantly seen in the use of opioids and antibiotics. Although all patients were prescribed an opioid, a minority of the patients were prescribed an antibiotic in the orthopaedic ward. Mainly, oxycodone was prescribed and therefore DRPs associated with oxycodone are very important.

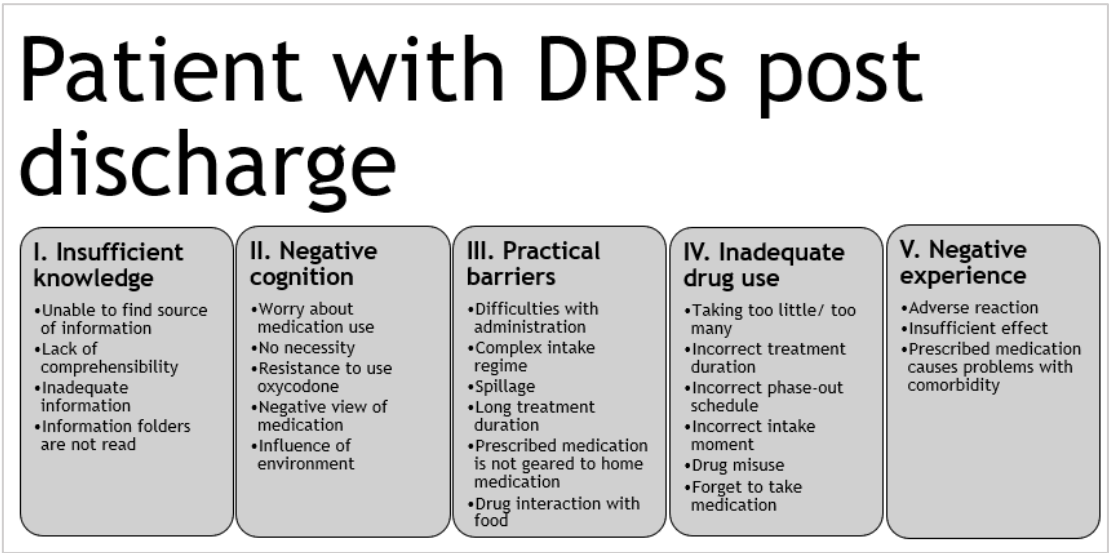

Figure 1. Conceptual model: Five main themes derived from the qualitative data.

Discussion

As the results of this study show, many patients have difficulty taking their medication adequately due to insufficient knowledge, negative cognition, practical barriers and this may lead to negative experiences with their medication.

Almost all patients valued medication knowledge such as mechanism of action, adverse reaction, treatment duration, drug use as important, while a substantial number of patients did not know this information because of lack of comprehensibility, inadequate information and could not find information source. Patients often face unmet informational needs about their medication. Tailored guidance is therefore desirable.

Overall, the findings of this study indicate, that patients experience most problems with oxycodone and antibiotics. These results of this study are in line with others.[14, 15]

Oxycodone is widely prescribed in the orthopaedic department. However, patients have developed resistance to the use of oxycodone because of side effects, such as nausea and constipation, insufficient effect and the fear of becoming addicted to this drug. Also, a part of the patients developed mental and physical health problems due to the use of oxycodone. These findings are in line with the opioid crisis nowadays in the United States. Opioid use and abuse has become a national crisis. Many misusers of opioids become addicted.[14] Strict prescription of oxycodone of healthcare providers is necessary to avoid misuse. Repeat prescription could be applied based on pain. This could also help avoid superfluous use and also medicine spillage. In addition, it is important to eliminate fear by providing excellent medication information.

Most practical barriers are seen in the treatment of orthopaedic infections, which include most commonly a prolonged course of systemic antibiotics, usually for at least 4-6 weeks. Patients find this very long.[15] The use of local antibiotics could shorten the therapy duration and thereby limiting the frequency of systemic side effects.[16, 17] Besides, antibiotics are known to have a complex intake regime and patients have to take a large amount of pills. Inappropriate use of antibiotics may lead to the development of resistance, adverse reactions and increased costs of therapy.[5] Most patients administrated antibiotics correctly, but some did not (un)intentional.[18] Improving antibiotic stewardship is necessary to increase optimal pharmacotherapy and reduce resistance, adverse reaction, and costs.

Good education about the benefits and risks of medicines is necessary. Future research should focus on how personal-medication counsellors could provide the best follow-up care post discharge, as it may prevent drug-related problems orthopaedic patients experience and could help to achieve optimal pharmacotherapy. Perhaps a telephone conversation or a digital chatbot could be potential information channels to improve follow-up care post discharge. If this does not help enough, a community pharmacist home visit post discharge could also be a potential option. As a result, the balance in care is shifting more from hospital care to home. However, the pros and cons need to be explored in a follow-up study.

Strengths and Limitations

The primary strength of this study is the identification of which DRPs orthopaedic patients experience post discharge, which could help with the development of effective interventions to reduce DRPs. Second, Recall bias is limited in this study. Because patients were being asked to describe DRPs problems they experience at that moment. Another strength of this study is that a member check was performed to increase the internal validity. The internal validity of this study has also been increased because the data from the first two interviews were coded by two different researchers (AL, EM) separately. The population was representative and generalizable.

Some limitations should be acknowledged. This study was carried out only in de Sint Maartenskliniek in the Netherlands. Therefore, generalisation of the study results should be viewed with caution. Due to the COVID pandemic restriction interviews were conducted over the phone, which made it impossible to respond to non-verbal cues. When medication use was surveyed, the majority of the patients reached for their medication list. As a result, it is not clear whether patients have actually used their medication as prescribed or have given a desirable response to the question. For this reason, it is more difficult to survey DRPs.

Conclusions and recommendations

The findings of this study show not only that orthopaedic patients indeed experience drug-related problems. Also, this qualitative study provides insight in which DRPs orthopaedic patients experience post

discharge. Now it is known where the focus should be in order to guide patients with their medication use. That is the added value of this study.

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Appendix

Sint Maartenskliniek

RESEARCH PROPOSAL SMK

A. DYNAMIC PEER REVIEW BOARD

Title research
Application of a single centre qualitative study in order to map drug-related problems within six weeks after orthopaedic surgery
Contact person
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Organizational data
Project Manager: Bart van den Bemt, (B.J.F.) Other researchers: Annemieke Louters (Intern RESEARCH student Pharmacy, Utrecht University) Department: Pharmacy Planning: 08-02-21 – 02-07-21 Budget attached: Voor het transcriberen is geld beschikbaar vanuit Farmacie Sponsor: n/a
Background Information
Annually, more than 8.000 orthopaedic surgical procedures are performed in de Sint Maartenskliniek. Patients are prescribed postoperative medications to enhance their recovery and to reduce postoperative complications. It is estimated that patients receive on average five additional medications after orthopaedic surgery, which must be continued post-discharge. Frequently prescribed postoperative medications are analgesia (including paracetamol, Non-steroïdal Anti-Inflammatory Drugs (NSAIDs) and opioids), thrombosis prophylaxis and antibiotics.[1, 2] Practice shows that patients, undergoing orthopaedic surgery at the Sint Maartenskliniek, are prescribed an average of four additional medicines. Optimal pharmacotherapy is achieved if the following treatment goals are achieved: minimal adverse reactions, maximum achievement of the desired effect and maximum patient satisfaction.[3] However, research shows that optimal pharmacotherapy is often not achieved, because of drug-related problems (DRPs) that patients experience with their medication use.[4, 5] DRPs are events or circumstances involving drug therapy that actually or potentially interfere with desired health outcome and can change over time. Examples of

DRPs patients experience could be adverse reactions, practical intake problems, lack of social support, knowledge barriers, costs, necessity, concerns, problems with incorporating intake in daily routine, etc.

The prevalence of DRPs post-discharge varies from 14 to 49 %.[6] However, little information is available on DRPs specifically experienced by orthopaedic patients after surgery. Only the study of Haley et al. (2009) examined DRPs in orthopaedic patients undergoing elective total joint arthroplasty of the hip or knee. It was shown that 23,3% of these patients experienced DRPs postoperatively.[7]

In the current situation there is no information available about DRPs orthopaedic patients experience from the Sint Maartenskliniek in the Netherlands. This qualitative study in orthopaedic patients therefore aims to get more insight in the DRPs patients experience until 6 weeks of their postsurgical patient journey. The findings of this study could inform interventions in the near future.

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Aim and research question

Aim of this study: In this study we would like to assess drug-related problems experienced by patients within six weeks after orthopaedic surgery, so that patients' pharmaceutical support needs can be mapped

Research question: Which drug-related problems experience patients within six weeks after orthopaedic surgery?

Study design

Qualitative study design (interview study)

Criteria

Inclusion criteria:

Patients ≥ 18 years; being able to communicate in Dutch; informed consent; patients undergoing a scheduled orthopaedic surgery

Exclusion criteria: children, day treatments

Sample size

Data saturation (estimated number of patients: 12)

Data saturation occurs when no new information becomes available during the last two interviews.

Outcome maisure

Drug-related problems

Methods

In this qualitative study patients who must undergo orthopaedic surgery will be interviewed to get a complete overview of DRPs what patients experience during their patient journey. A semi-structured interview guide (appendix) is compiled from the TRIAGE. This framework is used to identify drug-related problems patients experience and is based on ten domains [8]:

- Knowledge barriers
- Necessity
- Concerns
- Practical intake problems
- Adverse reactions
- Complexity of the medication (regime)
- Problems with incorporating intake in daily routine
- Costs
- Social support
- Vulnerable patients who are unable to understand or apply information

This interview guide will be pilot tested. Annemieke Louters (trainee) will conduct two interviews for the pilot test, mainly to check whether the questions raise any ambiguity. As a result from the pilot test the formulation of the opening questions could be slightly adjusted.

Conducting the interviews

Since DRPs can change over time, two interview moments have been chosen: 1 week after surgery (week 1); 6 weeks after surgery (week 6). This means that there is a six week follow-up period. The interview that takes place on week six serves to identify whether other problems have arisen within the domains requested in week one.

All interviews will be conducted over the phone.

All interviews will be audio-recorded and transcribed ad verbatim with participants' permission.

The COREQ-checklist will be used to ensure comprehensive reporting. A member check will be performed.

Transcribing will be outsourced to "secretaressehulp"

Selection of the patients

A daily overview is generated in the pharmacy to prepare the medication for the patients to be admitted. This overview will be used to make a selection on patient characteristics: age, sex, and medication use.

Annemieke Louters will include all the patients. Annemieke Louters will approach all patients during hospitalization to give written consent to participate to this study.

Processing the data

The data obtained from the pilot test will be independently analyzed and coded by two different researchers. Afterwards, the two researchers will discuss the coding to form a preliminary coding scheme.

All data will be anonymized and axial coded. ATLAS or Excel will be used to analyze data.

COREQ (COnsolidated criteria for REporting Qualitative research) Checklist

A checklist of items that should be included in reports of qualitative research. You must report the page number in your manuscript where you consider each of the items listed in this checklist. If you have not included this information, either revise your manuscript accordingly before submitting or note N/A.

Topic	Item No.	Guide Questions/Description	Reported on Page No.
Domain 1: Research team and reflexivity			
Personal characteristics			
Interviewer/facilitator	1	Which author/s conducted the interview or focus group?	2
Credentials	2	What were the researcher's credentials? E.g. PhD, MD	2
Occupation	3	What was their occupation at the time of the study?	2
Gender	4	Was the researcher male or female?	2
Experience and training	5	What experience or training did the researcher have?	2
Relationship with participants			
Relationship established	6	Was a relationship established prior to study commencement?	2
Participant knowledge of the interviewer	7	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	appendix
Interviewer characteristics	8	What characteristics were reported about the interviewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	appendix
Domain 2: Study design			
Theoretical framework			
Methodological orientation and Theory	9	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	2
Participant selection			
Sampling	10	How were participants selected? e.g. purposive, convenience, consecutive, snowball	2
Method of approach	11	How were participants approached? e.g. face-to-face, telephone, mail, email	2
Sample size	12	How many participants were in the study?	2
Non-participation	13	How many people refused to participate or dropped out? Reasons?	2
Setting			
Setting of data collection	14	Where was the data collected? e.g. home, clinic, workplace	2
Presence of non-participants	15	Was anyone else present besides the participants and researchers?	2
Description of sample	16	What are the important characteristics of the sample? e.g. demographic data, date	2
Data collection			
Interview guide	17	Were questions, prompts, guides provided by the authors? Was it pilot tested?	2
Repeat interviews	18	Were repeat inter views carried out? If yes, how many?	2
Audio/visual recording	19	Did the research use audio or visual recording to collect the data?	2
Field notes	20	Were field notes made during and/or after the inter view or focus group?	2
Duration	21	What was the duration of the inter views or focus group?	2
Data saturation	22	Was data saturation discussed?	2
Transcripts returned	23	Were transcripts returned to participants for comment and/or correction?	2
Domain 3: analysis and findings			
Data analysis			
Number of data coders	24	How many data coders coded the data?	2
Description of the coding tree	25	Did authors provide a description of the coding tree?	appendix
Derivation of themes	26	Were themes identified in advance or derived from the data?	2
Software	27	What software, if applicable, was used to manage the data?	2
Participant checking	28	Did participants provide feedback on the findings?	2
Reporting			
Quotations presented	29	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	3, 4
Data and findings consistent	30	Was there consistency between the data presented and the findings?	
Clarity of major themes	31	Were major themes clearly presented in the findings?	3, 4, 5
Clarity of minor themes	32	Is there a description of diverse cases or discussion of minor themes?	3

Information and consent form data collection

Sint Maartenskliniek

Explanation data collection

On behalf of the pharmacy of the Sint Maartenskliniek, you are asked to participate in this study. Whit this study we would like to gain insight into the experiences of patients with their medication use post-discharge. Thereafter, the findings of this study may help us improve patient guidance on medication use.

What does this study involve?

You will be interviewed twice. The first moment will take place, one week post discharge, and the second interview approximately six weeks post discharge. During these interviews, you are asked, among other things, 1) what were your thoughts about using your medication, 2) What problems did you experience while taking the medication and 3) If there is anything you would need to be able to use your medication properly?

What data will be collected?

Besides the two interviews that will be conducted, the following data will be collected from the hospital system:

- Date of birth
- Sex
- Phone number
- Medication use prior to admission
- Hospital ward

What happens to your data?

To protect your privacy we only use encrypted data, your name and other directly identifiable information is omitted. The key to the code remains safely stored with University Utrecht. Even in reports and publications, the data cannot be traces back to you. Only care providers and project employees of this hospital can view the data.

More information about your rights when processing your data

For general information about your rights when processing your personal data, you can consult the website of the Dutch Data Protection Authority. If you have any questions about your rights, you could contact the person responsible for the processing of your personal data, B.J.F. van den Bemt reachable on secretariaat.farmacie@maartenskliniek.nl.

You could also contact the institution's Data Protection Officer Ms. Van Rijsingen-Adams reachable on am.vanrijsingen@maartenskliniek.nl, or you could contact Authority Personal Data.

What do we ask of you?

If you decide to participate, we would like to ask you to sign the enclosed consent form.

Sint Maartenskliniek

Consent

Consent to conduct two interviews and record above data:

- I have read the information above. My questions have been sufficiently answered. I had enough time to decide whether to participate.
- I know that some people use my data for the purposes stated in this letter. I agree. The people who use this data are listed in this letter.

Name participant:.....

e-Mailadress:.....

Signature:..... Date: __ / __ / __

I declare that I have fully informed this subject about this study.

Name contributor:.....

Signature:..... Date: __ / __ / _

Table 1. TRIAGE practical question set.

Opening Questions	**Follow-up Questions**
1. I am curious about your experiences. How have you been taking this medicine lately?	Suggestion for first refill: - Can you tell me a bit more about how you use this medicine? - Is there anything to find troublesome in using this medicine? Suggestions for follow-up refill: - Has anything changed in how you use the medicine? - Can you tell me more about that? - To what extent do you manage to take the medicine every day? - How do you make sure you don't forget to take your medicine?
2. Medication can also have side effects. How is that for you? Do you experience side effects of this medicine?	Suggestion for first and follow-up refill: - We know this medicine can cause… (fill in by PT) as a side effect. You have also experienced this?
3. How do you feel about using this medicine (long-term)?	Suggestion for first and follow-up refill: - How important is it to you to use this medicine every day? - Do you have concerns about this medicine? - What would be a reason for you to stop taking this medicine? Suggestion for specific for follow-up refill: - What effect do you experience from the medicine?
4. Which questions do you still have?	Refer to additional, reliable information about the medicine.

Interview guide week 1: Introduction

Good morning / Good afternoon sir / madam,

My name is X I am a research intern at the pharmacy of the Sint Maartenskliniek. You have given permission to participate in a scientific study, Is this correct? First of all, I would like to thank you for participating. I will ask you a number of questions about the use of the medication that you received additionally from the hospital post discharge. This conversation will be audio recorded and will last approximately 15 to 30 minutes. Do you have any questions beforehand?

Table 2. Question set interview guide.

Opening questions	**Follow-up questions**
1. Last week you were hospitalized in the orthopaedic department of the Sint Maartenskliniek. First of all, how are you doing? You have received numerous additional medicines from the hospital. Can you tell me which medicines you have received additionally? I am curious about your experiences with the use of these medicines. Can you tell something more about how things are going?	**Suggestion:** - Experiences - When and how? - Injections - Antibiotics given at specific times - Effect - Surroundings
2. Medicines can, in addition to the desired effect, cause adverse reactions. How is this for you?	**Suggestion:** Medicine X is known for these side effects…Do you recognize this side effect? **In case of antibiotics:** nausea, dry mouth, gastrointestinal complaints **In case of heparines:** irritation at the puncture site, bruising **In case of pain medication:** constipation, sleepy / drowsy, nausea, headache, dizzy
3. How do you feel about using these medicines?	**Suggestion:** - Necessity - Expectation - Fears / worries (for example: addictive effect oxycodone) - Reason to stop
4. I would like to gain more insight into how well you are able to take your medicines every day. I can imagine that it is quite difficult to take all the medicines every day. How is that for you?	**Suggestion:** - Therapy compliance - Too much/ too little / forgotten - Wrong use (un)consciously - Different, namely..
5. We would like to guide you properly with your medication use. What would you like to know about your medicines before taking them?	**Suggestion:** - Information provision - Moment - Content / quantity - How to receive information: Information channel (FAQ, telephone conversation, digital (chatbot/video), different

Closing Week 1

I have run out of all my questions. Is there anything else that concerns you regarding your additional medication? I would like to thank you very much for your openness and for your time. I would like to contact you again by telephone in five weeks from now to see how your medication use is going and what your experiences are. I would like to arrange a date and time with you. What suits you best? Then I will talk to you in five weeks and I would like to wish you a very nice day and a speedy recovery!

Interview guide week 6: Introduction

Good morning / Good afternoon sir / madam,

This is X speaking, research intern at the pharmacy of the Sint Maartenskliniek. As we agreed, I would contact you today to conduct another interview. During our conversation I will ask you a number of questions about your experiences with taking the additional medication you received after hospitalization in the orthopaedic department of the Sint Maartenskliniek. During the first interview you indicated that… How are things?

Closing week 6

I have no further questions to ask you, but before we stop, do you have any further concerns regarding your additional medication? This was the last interview for this study. I will send you an abstract of our conversation by e-mail. I would like to thank you very much for your openness, your time and for participating in this study. I wish you a good recovery!

Definitive coding Tree