

BMJ Open Quality of outpatient parenteral antimicrobial therapy (OPAT) care from the patient's perspective: a qualitative study

Marvin A H Berrevoets,^{1,2} Anke J M Oerlemans,² Mirjam Tromp,¹ Bart Jan Kullberg,¹ Jaap ten Oever,¹ Jeroen A Schouten,^{1,2} Marlies E Hulscher^{1,2}

To cite: Berrevoets MAH, Oerlemans AJM, Tromp M, *et al.* Quality of outpatient parenteral antimicrobial therapy (OPAT) care from the patient's perspective: a qualitative study. *BMJ Open* 2018;**8**:e024564. doi:10.1136/bmjopen-2018-024564

► Prepublication history for this paper is available online. To view these files, please visit the journal online (<http://dx.doi.org/10.1136/bmjopen-2018-024564>).

Received 1 June 2018
Revised 13 August 2018
Accepted 20 September 2018



© Author(s) (or their employer(s)) 2018. Re-use permitted under CC BY-NC. No commercial re-use. See rights and permissions. Published by BMJ.

¹Radboud Center for Infectious Diseases, Radboud University Medical Center, Nijmegen, The Netherlands

²Scientific Center for Quality of Healthcare, Radboud Institute for Health Sciences, Radboud University Medical Center, Nijmegen, The Netherlands

Correspondence to

Dr Marvin A H Berrevoets;
mberrevoets@gmail.com

ABSTRACT

Objectives Current outpatient parenteral antimicrobial therapy (OPAT) guidelines recommend delivering patient-centred care. However, little is known about what patients define as good quality of OPAT care and what their needs and preferences are. The aim of this qualitative study is to explore the patients' perspective on high-quality care, and to explore what patient-centred care means to adult OPAT patients.

Design and setting This is an explorative, descriptive study using qualitative methods. We conducted focus group interviews with 16 adult patients (5 female, 11 male) from 3 different hospitals, who received OPAT and 2 individual semistructured interviews with their informal caregivers in the Netherlands. We used purposive sampling to ensure diversity of participants. We used the eight Picker principles of patient-centredness to guide data collection and analysis.

Results Participants reported several elements considered as important for patient-centred OPAT care, like patient involvement in the decision-making process, a responsible OPAT lead, intensive collaboration between all disciplines involved, information provision and adherence to hygiene guidelines. Two central dimensions emerged as essential constituents of patient-centred OPAT care: freedom and safety. Both are heavily influenced by the behaviours of healthcare professionals and by organisational aspects beyond the direct influence of these professionals.

Conclusion This study provides insights into the needs and preferences of adult patients who receive OPAT care. Future interventions directed at the improvement of patient-centredness of OPAT care should focus on elements that enhance patients' feelings of freedom and safety.

INTRODUCTION

Outpatient parenteral antimicrobial therapy (OPAT) is a treatment option that enables patients to receive parenteral antimicrobials at home, as an alternative to inpatient care. OPAT has been used for over 40 years, and a growing body of research supports its clinical applicability and cost-effectiveness.

Strengths and limitations of this study

- This is the first study that explored the needs and preferences of adult patients who receive outpatient parenteral antimicrobial therapy (OPAT) care based on the eight Picker principles of patient-centredness.
- We recruited patients from three different hospitals and used purposive sampling for the selection of patients, which created a diverse study population.
- For all eight Picker dimensions of patient-centred care views from participants were obtained.
- Data saturation was reached, and in-depth interviewing was performed with two involved relatives to explore subdomains.
- Only one OPAT care model (most prevalent in Dutch healthcare) was applicable to this study population.

The primary goals of outpatient therapy programmes are to allow patients to complete treatment safely and effectively in the comfort of their home or another outpatient site, and to avoid the potential inconveniences, complications and expense of hospitalisation.¹

Current guidelines for OPAT recommend the provision of high-quality, patient-centred care that is easily accessible.^{1,2} The Institute of Medicine has defined patient-centred care as 'providing care that is respectful of and responsive to individual patient preferences, needs and values, and ensuring that patient values guide all clinical decisions'.³ There is a growing body of evidence that improving the patient-centredness of care can lead to positive clinical outcomes for patients.⁴

In 1988, the Picker Institute defined the term 'patient-centred care' to call attention to the need for clinicians, staff and healthcare systems to shift their focus away from diseases and back to the patient and family.⁵ Using a wide range of focus groups—recently discharged patients, family members, physicians and non-physician hospital

staff—combined with a literature review, eight dimensions of patient-centredness were identified, which represent the most important indicators of quality and safety from the perspective of patients: respect for the patient's values, preferences and expressed needs; coordinated and integrated care; clear, high-quality information and education for the patient and family; physical comfort, including pain management; emotional support and alleviation of fear and anxiety; involvement of family members and friends, as appropriate; continuity, including through care-site transitions and access to care.⁵

Limited information about the patient-centredness of current OPAT care is available. Previous studies that focused on patient experiences and perceptions showed that the safety of treatment at home is of great importance for OPAT patients.^{6–9} Several other factors were found to be important (such as clear communication, coordination and integration of medical care and respect for patient preferences) highly depending on the social and cultural background of patients. Those studies did not systematically assess all domains of patient-centredness.

The aim of this study is to explore patients' needs and preferences for high-quality OPAT care, and to explore what 'patient-centred care' means to adult OPAT patients based on the eight Picker principles of patient-centredness.

METHODS

We conducted focus group interviews with patients to explore all relevant preferences and needs for patient-centred care, and individual interviews with caregivers. All interviews took place in March to May 2017.

Focus group interviews

Recruitment for the focus group interviews took place in three Dutch hospitals: one university hospital, one non-university teaching hospital and one tertiary care hospital that specialises in prosthetic joint infections. We selected patients who received ≥ 2 doses of intravenous antibiotics at home, ≤ 3 months before the focus group meetings occurred. We used purposive sampling to ensure diversity of participants (ie, age, gender, diagnosis and treatment duration).¹⁰

Patients were invited to participate by their physician. Participants were informed by (e)mail about the study objectives and subsequently asked to participate. The focus groups took place at the hospital where patients had been treated. The number of focus groups depended on the point of saturation, that is, when no new information could be identified from the data.¹¹ We aimed for groups of four to eight participants.¹²

Focus group interviews were led by an experienced moderator (AJMO), in the presence of one researcher (MAHB). Both interviewers had no treatment relationship with any of the patients. Each focus group interview commenced by explaining the goal of the meeting, introducing the researchers and the group participants.

Box 1 Picker principles of patient-centredness

- ▶ Access to care.
- ▶ Information, communication and education.
- ▶ Respect for patient values, preferences and needs.
- ▶ Physical comfort.
- ▶ Coordination and integration of care.
- ▶ Emotional support and alleviation of fear and anxiety.
- ▶ Involvement of family and friends.
- ▶ Continuity and transition.

We used a semistructured focus group guide, based on the eight principles of patient-centred care (box 1), defined by the Picker Institute,⁵ and discussed the three phases of OPAT care: (1) Initiation of OPAT; (2) Transition of OPAT care from hospital to home and (3) OPAT care at home.

Individual interviews

Patients' perceptions of care can differ from those of their informal caregivers. To explore these differences, we held individual interviews with informal caregivers for further exploration of the Picker principle 'involvement of family and friends'.⁵ Focus group candidates were asked whether a relative was closely involved with OPAT care and would agree to participate in an interview.

The interview guide was based on the eight Picker principles of patient-centred care and adjusted to the role of the relative.

All participants received written information about the project and its aims, and were subsequently invited to participate. We stressed that participation in this study was voluntary and withdrawal from the study was possible at any time. The anonymity of participants was maintained in the interview transcripts.

Data analysis

The focus groups and interviews were recorded with a digital voice recorder and transcribed verbatim by an independent transcriber. The transcripts were analysed using a thematic content analysis approach based on the eight Picker principles with the qualitative software programme Atlas.ti. To increase intercoder reliability, the researcher and the moderator independently coded all transcripts. Any discrepancies in the analysis were discussed until consensus was reached.

After reaching consensus at code level, two researchers together agreed on a provisional categorisation and overarching themes. The categories and themes were subsequently presented to and discussed with a third researcher (MEH). This deliberative process resulted in the analysis presented in the manuscript.

Patient and public involvement

Patients were not involved in the development of the research question, the design, recruitment or conduct of this study. The results of this study will be disseminated to interested study participants by email.

Table 1 Characteristics of focus group participants

	Focus group participants (n=16)
Male (%)	11 (69)
Mean age (range)	68 (47–85)
Hospital type	
University (%)	5 (31)
Teaching (%)	5 (31)
Tertiary centre (%)	6 (38)
Focus of infection	
Joint prosthesis	8 (50)
Urinary tract	1 (6)
Vascular prosthesis	5 (31)
Endocarditis	2 (13)
Treatment duration	
0–2 weeks	2 (13)
2–6 weeks	4 (25)
6–12 weeks	4 (25)
>12 weeks	6 (38)

RESULTS

Study population

We conducted three focus group interviews of 90–120 min each. A total of 18 patients intended to participate of whom 16 were present. Participant characteristics are listed in [table 1](#). We conducted two individual interviews with relatives: the son of a 86-year-old patient and the mother of a 22-year-old patient with a cognitive impairment.

Initiation of OPAT

All participants had been admitted to the hospital and had already received a course of intravenous antibiotics when the decision to continue treatment at home was made. Representative quotations related to the initiation phase are shown in [table 2](#).

Virtually all participants indicated that the decision to initiate OPAT was made by the physician without involving the patient and their relatives. Some participants felt this violated their autonomy: ‘You’re still dealing with people and in this case, in my personal case, it was just like: ‘We’re doing it, period. You don’t have any say’ (male, 52 years, <2 weeks).

One patient stated that he would have preferred to stay in the hospital for the remaining days of therapy, had he been given that option.

The insertion of an intravascular access device came as a surprise for some patients ‘they don’t explain the procedure at all, they just move you to the procedure room’ (female, 70 years, 7 weeks), others received written as well as oral information and were able to watch the insertion of the device on a monitor during the procedure. Not knowing what was going to happen made patients feel unsafe, anxious and uncertain.

The type, amount and quality of information provided about the entire OPAT process varied among the hospitals ([table 2](#)). Most patients indicated they would have wanted more information about the antibiotics, the possible side effects and interactions. Sometimes, relatives participated in searching for information on the internet. Participants emphasised the importance of the presence of relatives during information sessions or patient–doctor conversations.

Table 2 Quotes related to the initiation phase of outpatient parenteral antimicrobial therapy (OPAT)

Picker principle	Representative quotes	Patient characteristics (gender, age, weeks of OPAT)
Respect	But in such a case, I’d like to see that there is a choice. That it’s explained as, ‘This is what we want to do. What do you think?’ Not: ‘This is what we’re going to do. Period.’	Male, 52 years, 1 week
Emotional support	That was because I was at my wits’ end, the nursing staff themselves arranged to get me an antibiotic device so that I could at least go home on the Sunday afternoon. For a little while.	Female, 71 years, 6 weeks
Information	At one point I was rolled away and a PICC was placed. I thought, ‘What’s going on? They could explain a little about how and what?’ But they didn’t.	Female, 70 years, 7 weeks
Coordination	Yes, I had the impression that it (OPAT) was hardly ever done in the urology department. Because the doctors, the medical specialists, who... They all tell you something different. Look. If it has occurred more often, and if it has happened to a patient more often, then they start telling you everything all at once...	Male, 52 years, 1 week
Involvement of family and friends	My husband came to visit me every morning at nine thirty because that’s when they came round, uh, the doctors and so on. But things just went right over my head, just like that, and then he had stored it all up, and that was certainly important.	Female, 70 years, 3 weeks
Involvement of family and friends	If a patient is competent in making decisions, as my father is, then I think if he knows things himself and can tell you, fine, but we must remember that my father is 85, and he can sometimes forget something. So it is always convenient to have an informal caregiver present who can translate that into what is essential, what’s coming our way, and in the current trajectory, what is the best method to deal with it?	Male relative

Table 3 Quotes related to the transition phase of outpatient parenteral antimicrobial therapy (OPAT)

Picker principle	Representative quotes	Patient characteristics (gender, age, weeks of OPAT)
Respect	The only thing I had great difficulty with was that actually—yes, nothing against their home care organisation—but that they were forced on me somewhat. At a certain point I said, ‘I have my own home care organisation.’ ‘No, we have contracts with a specific one.’ I thought that in fact the patient still decides who does or does not come to his home.	Male, 80 years, 8 weeks
Information	But if someone comes to me now ‘I have to go home tomorrow and I’m getting a PICC’, then I would just tell him what a day looked like for me. That’s different for everyone personally.	Male, 52 years, 1 week
Coordination	What also is a very big point, in my opinion, in terms of communication here, is that the first time I was to go home, it didn’t happen. It appears that they had said in the department, ‘You can go home with this antibiotic.’ They had not taken this into account in the department: 3 days go by after they send off the application before they process it here and have the medicines ready. Three days in between, and they had forgotten that. Forgotten, well, they did not know that.	Male, 52 years, 1 week
Continuity and transition	They said that I could go home Tuesday, and then it was Friday because the antibiotic was not ready and so on, uhm.	Female, 71 years, 6 weeks
Continuity and transition	It went pretty smoothly for me. They said to me on Thursday, ‘We’ll place a PICC for you.’ That was done on Friday, and then they came to tell me, ‘Tomorrow the Home Care will be there.’ That was all very well arranged.	Male, 57 years, 12 weeks
Physical comfort	Medication was administered continuously through the PICC for 6 weeks in the hospital, and now it’s once a day, so this is just great for me. I’m also enjoying life. I am very happy.	Female, 65 years, 12 weeks

According to patients, important topics to be discussed were potential antibiotic side effects and instructions for use, information about intravascular access devices, potential complications and how to handle problems or complications and information about treatment progress. Participants agreed that both written and oral information should be given. Well-informed patients seemed to feel safe and secure, while a lack of information could lead to feelings of concern.

Transition of care from hospital to home

For this phase of OPAT care, vast differences between hospitals were found. In one hospital, the transition of OPAT was said to be delayed quite often (see table 3 for representative quotes). Lack of a responsible person and lack of collaboration between the disciplines involved was the main reason according to the patients. The additional admission days lead to feelings of uselessness and wasting money and resources: ‘I was just lying there for no reason at all, I wasn’t sick or anything. Well, then I can’t stand being in a hospital, when I’m just waiting for the doctor all day’ (female, 71 years, 6 weeks) (table 3). Sometimes, discharge was postponed by several hours because of a delay in antibiotic preparation by the pharmacist. As long as patients were informed about the reasons of this delay, this was not seen as a major problem.

In another hospital, patients were well prepared for discharge and knew what to expect at home. An employee of the home care team visited the patients and assisted

with the transition of care by providing information, a ‘starter package’ (containing bandages, needles, fluids for infusion), and explaining the course of treatment after discharge.

An ongoing collaboration between the referring physician, the pharmacy and the home care team was seen as a prerequisite for successful care transition. Some patients emphasised the lack of an OPAT expert who is responsible and coordinates care transition. According to those patients, the presence of an OPAT expert would really improve the quality of care, and would made them feel secure.

OPAT care at home

The majority of patients were very positive regarding the therapy at home, especially regarding the nurses of the home care team (see table 4 for representative quotes). Patients appreciated their professionalism: a uniform and hygienic manner of working made them feel safe and secure. Additionally, participants valued nurses’ attentiveness to both the patient’s and family’s emotional needs—showing compassion through not only attaching the antibiotic device, but by holistic nursing: ‘I feel that I have a doctor who is at my bedside every day’ (male, 80 years, 8 weeks).

All patients were provided with instructions regarding how to act in case of complications. Complications most frequently mentioned were related to the intravascular access device (obstruction, dislocation or bleeding).

Table 4 Quotes related to outpatient parenteral antimicrobial therapy (OPAT) care at home

Picker principle	Representative quotes	Patient characteristics (gender, age, weeks of OPAT)
Access to care	But you can also contact Home Care 24/7. I liked that.	Female, 65 years, 12 weeks
Respect	They have experienced nurses, which is very enjoyable. I feel that I have a doctor who checks everything completely and who is at my bedside every day.	Male, 80 years 8 weeks
Respect	Interviewer: What makes a really a nice home care nurse? A nurse who makes you think: those are the qualities that someone must have, or you think, 'I feel I can really depend on them.' Male 78 years: Have time for you, that you can tell your story. Male 52 years: Then we come back to that word, you know: human. Female 70 years: Not only to connect that thing and get out, but there were also some who sat down to eat at the table.	
Emotional support	You have to... you're stuck with it every day. You eat beforehand, you make sure you tidy up a little and things like that, so you really have no vacation at all nor any rest of your own, not really.	Female, 70 years, 3 weeks
Emotional support	They say, 'You are free.' But you're not at all. Two hours beforehand you have to take the stuff out of the fridge, they come sometime between 8 and 10 in the morning, so that's 4 hours, and they do that twice a day, so that's 8 hours a day, 8 of the 14 hours that you're up. Then you have little time left for yourself. Look, for a very long period, like months on end, super. Then it's a super system, but not for a period of... yes, 6 days in my case.	Male, 52 years, 1 week
Emotional support	I said this week to my specialist, in my personal case, then, 'Behind every door you expect an exit, but there is another door and yet another door.'	Male, 52 years, 1 week
Information	I have not been told anything at all and I am a somewhat surprised, because I do not know how it will turn out. I had expected that at least an interim balance would be drawn up. Something like: 'How are we doing?'	Male, 80 years, 8 weeks
Continuity and transition	Of course I had to deal with planning for the therapy at the hospital and consequently had to deal with the taxi company and with the Home Care. That was all rather difficult, especially the first few weeks. Things went wrong a number of times. If the first domino falls the wrong way, then the planning for the rest of the day falls apart.	Male, 65 years, 13 weeks
Involvement of family and friends	Interviewer: Are there other things that people should know when they go home and administer this type of antibiotic at home? Male, 47 years: No. At least, I'll just have a look, in my case, because I am younger than all of you: warn people, bear in mind that it is also a violation of your privacy. Especially if you have children who live at home. The time will come when they start saying, 'Is Home Care here again??' So it does have an impact on your privacy.	Male, 47 years, 57 weeks
Physical comfort	I only had Home Care for a few weeks, but I would have liked to have had it longer. A year on clindamycin; I have had more problems with that than with the PICC.	Male, 75 years, 1 week

In those cases, patients had immediate access to care through the hospital's emergency department—patients appreciated this prudent policy of 'better to be safe than sorry' (female, 65 years, 12 weeks). Questions regarding the antibiotics were settled less appropriately. Contradictory information was a source of great frustration, for example, when questions arose regarding the amount of antibiotics that remained in the elastomeric pumps. Patients felt indignant that nobody was able to provide a definitive answer to their questions.

Advantages and disadvantages of OPAT

The main advantages of OPAT for most participants were the possibility to go home, feelings of freedom, and a faster recovery compared with an extended hospital stay. Adapting the visiting hours of the care provider to the patient's schedules was often mentioned as a prerequisite. Most patients wanted to participate in social activities (eg, a birthday party) and appreciated the flexibility of care providers.

However, OPAT was considered an impairment too: both physically due to the device and the intravenous catheter

(which hindered showering, walking, sleeping), and due to the impact on privacy and personal time: 'But I have a life too, a private life. OPAT is not only about antibiotics' (male, 47 years, 57 weeks). Another patient stated: 'It is an invasion of privacy' (male, 52 years, 1 week). The impact of this impairment was different for distinct types of patients. Patients who received continuous infusion of antibiotics generally felt more impaired compared with those receiving a single daily administration. Tiredness was often mentioned as a hindrance for participating in social activities. For people without mobility limitations due to their underlying illness, OPAT negatively impacted their freedom, while people who were already limited in their mobility (eg, joint prosthesis infection) did not experience OPAT as a substantial additional impairment of freedom. Some patients also received home care for help with daily living activities, in addition to the specialist nurse who attached the antibiotic device. 'At a certain moment, I had 3 people around: first home care came to help with showering, then at 8.30am the cleaner visited me, and thereafter the OPAT nurse' (female, 70 years, 7 weeks).

DISCUSSION

In this study, we investigated the patient-centredness of OPAT care, based on the experiences and preferences of patients and relatives. From our focus group interviews, two central values emerged as essential constituents of patient-centred OPAT care: freedom and safety. Different elements of the OPAT care process strengthen or undermine these values. These elements provide clear keystones to improve patient-centredness of OPAT care. Our findings are in line with other qualitative studies addressing patients' perspectives on antibiotic therapy. Bamford *et al* showed that patients want to be more involved in the decision to continue antibiotics at home.⁷ Furthermore, in their study population patients worried about the organisation and safety of OPAT.

In the context of OPAT care, freedom involves the ability to live and make decisions about one's life without being limited or restricted. A major advantage of OPAT care compared with in-hospital antibiotic administration is the ability to leave the hospital and go home, to one's own familiar environment, which greatly increases feelings of freedom. However, our findings indicate that freedom is sometimes negatively influenced by behaviour of healthcare professionals involved and by aspects beyond the direct control of these professionals (ie, organisational factors). In many cases, it is the sensation of losing control of a situation that leads to a reduced sense of freedom. For example, participants described how multiple specialist nurse visits a day reduced their sense of privacy and control, as they had to schedule their day around these visits. Disease or therapy-related symptoms, such as fatigue and the physical presence of the peripherally inserted central catheter (PICC) restricted participants' freedom too, as they were limited in activities such as showering and attending social functions. We confirmed the findings by Lehoux,⁸ who showed that OPAT patients tended to withdraw from social activities because of social stigmatisation and technical barriers. Furthermore, daily activities were compromised due to technical factors of the equipment.

Knowing that freedom is a core value for our participants, it was remarkable that decisions concerning the initiation of OPAT, hospital discharge, the choice of home care organisation and scheduling time of antibiotic administration were often made by healthcare providers without input from the patient or carers. Other authors have also observed this lack of shared decision-making: that decisions about the patient are not always made with the patient.¹³ This is an important area for improvement, as previous studies demonstrated that when providers, patients and family members work together, the patient-centredness and quality of care increases.¹⁴

The second central value, safety, means feeling free from danger or harm. Patients receiving OPAT have an invasive infection which may cause serious harm and is potentially fatal. Participants described decreased trust in their bodies and worried about their well-being. Contradictory information, difficulty accessing appropriate

expertise and care when encountering problems, and professionals not following hygiene guidelines, further contributed to these feelings of insecurity. Other studies also stressed the need for better communication about infection and treatment options in patients treated with antibiotics.^{6 7 9} Recently, Twiddy *et al* showed that many OPAT patients found looking after themselves more difficult than they had expected.⁶ Good communication and information by medical staff is needed to create this (self) confidence.

One participant poignantly described the importance of trustworthy care and healthcare professionals in this context: 'For me [...] the PICC line is a lifeline. There is no alternative. I cannot have another surgery, because my odds of survival are three percent. So this is literally and figuratively my lifeline... Because I have a bacterium somewhere and if it becomes active, it's over' (male, 47 years, 57 weeks).

Self-administration could enhance feelings of autonomy and freedom. Self-administration has been found safe in small cohort studies.¹⁵⁻¹⁷ Nevertheless, some patients in our study addressed the importance of a nurse specialist administering OPAT, and would not dare to deliver 'life-saving treatment' to themselves. Only one patient in our study (male patient, vascular prosthesis infection) participated in the self-administration model; he did not report any safety concerns during his treatment. Further studies should compare the different OPAT models in relation to patient-centredness and outcomes.

In line with the good practice recommendations for OPAT,² participants expressed the need for a medical lead, someone who is and feels responsible for OPAT care. Elements that inspire trust and contribute to a feeling of safety are clear and unambiguous communication and information, frequent feedback about treatment progress and direct accessibility of hospital care if needed. Additionally, the confident and compassionate care of the specialist nurse at home was often emphasised as a major contribution to feelings of safety.

Strengths and limitations

OPAT has been used for over 40 years and a wealth of evidence has accumulated supporting its clinical justification and cost-effectiveness. Our study considered all eight Picker principles of patient-centred care through a qualitative approach, which provides a more holistic view of patient experiences than previous quality of life studies.¹⁸

Although a qualitative study carries the risk of eliciting socially desirable responses from participants, we have reduced this risk by asking participants to describe their experiences rather than merely assessing their satisfaction,¹⁹ by using trained and experienced qualitative researchers to perform data collection and analysis, and by conducting multiple focus groups in different settings. We included a diverse and representative study population through purposive sampling.²⁰

The absolute number of participants in our study was relatively small. However, when considering the

labour intensiveness of qualitative research and the suggested number of interviewees in the literature, the number of focus group participants was more than required,²⁰ furthermore, we reached the point of data saturation.

Currently, the Netherlands only uses one model of OPAT delivery: the administration by a visiting specialist nurse. The impact of other models such as administration by a visiting general nurse or outpatient attendance at a healthcare facility was not investigated in this study. Nevertheless, we believe that our results are also applicable to other settings, as in all models treatment is organised from an outpatient setting with the patient residing at home. Furthermore, our results are in line with the findings of recent qualitative research to the different OPAT services provided in Northern England.⁶ Confidence in OPAT care appeared to be a major determinant of the feelings of safety.

Conclusions

This study has increased our understanding of the patient-centredness of OPAT care. The focus group interviews provided valuable insights into the needs and preferences of patients who receive OPAT. We have shown that keystones in improving the patient-centredness of OPAT care are focusing on elements that enhance patients' feelings of freedom and safety. Future interventions directed at the patient-centredness of OPAT care should focus on these elements.

Acknowledgements We are grateful to those interviewed for their generous participation, and to T. Sprong, D. Telgt, F. Vos, H. De Gouw, M. Dautzenberg for facilitating the performance of the study.

Contributors MAHB, AJMO, JAS and MEH conceived the study. MAHB and AJMO performed the data collection. MAHB, AJMO and MEH analysed and managed the data, including quality control. MT, BJK and JTO advised on study design and reviewed the manuscript. MAHB and AJMO drafted the manuscript, all authors contributed substantially to its revision. MAHB took responsibility for the paper as a whole.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient consent Not required.

Ethics approval The Regional Review Board for Human Research, Arnhem-Nijmegen (CMO no. 2016–3107) assessed the study, and judged that ethics approval was not required under Dutch National Law.

Provenance and peer review Not commissioned; externally peer reviewed.

Data sharing statement Interview guide and codebook available by request to the corresponding author.

Open access This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which

permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited, appropriate credit is given, any changes made indicated, and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>.

REFERENCES

1. Tice AD, Rehm SJ, Dalovisio JR, *et al*. Practice guidelines for outpatient parenteral antimicrobial therapy. IDSA guidelines. *Clin Infect Dis* 2004;38:1651–71.
2. Chapman AL, Seaton RA, Cooper MA, *et al*. Good practice recommendations for outpatient parenteral antimicrobial therapy (OPAT) in adults in the UK: a consensus statement. *J Antimicrob Chemother* 2012;67:1053–62.
3. Institute of Medicine. *Crossing the quality chasm. A new health system for the 21st century*. Washington, DC: National Academy Press, 2001.
4. Rathert C, Williams ES, McCaughey D, *et al*. Patient perceptions of patient-centred care: empirical test of a theoretical model. *Health Expect* 2015;18:199–209.
5. Picker Institute. *The eight picker principles of patient centered care*. Picker Institute: Oxford, 2013. (Accessed 13 Aug 2018).
6. Twiddy M, Czoski Murray CJ, Mason SJ, *et al*. A qualitative study of patients' feedback about Outpatient Parenteral Antimicrobial Therapy (OPAT) services in Northern England: implications for service improvement. *BMJ Open* 2018;8:e019099.
7. Bamford KB, Desai M, Aruede MJ, *et al*. Patients' views and experience of intravenous and oral antimicrobial therapy: room for change. *Injury* 2011;42:S24–27.
8. Lehoux P. Patients' perspectives on high-tech home care: a qualitative inquiry into the user-friendliness of four technologies. *BMC Health Serv Res* 2004;4:28.
9. Zanichelli V, Monnier AA, Tebano G, *et al*. Views and experiences with regard to antibiotic use of hospitalized patients in five European countries: a qualitative descriptive study. *Clin Microbiol Infect* 2018.
10. Seidman I. *Interviewing as qualitative research: a guide for researchers in education and the social sciences*: Teachers College Press, 2006.
11. Corbin JM, Strauss A. Grounded theory research: procedures, canons, and evaluative criteria. *Qual Sociol* 1990;13:3–21.
12. Kitzinger J. Qualitative research. Introducing focus groups. *BMJ* 1995;311:299–302.
13. Hesselink G, Flink M, Olsson M, *et al*. Are patients discharged with care? A qualitative study of perceptions and experiences of patients, family members and care providers. *BMJ Qual Saf* 2012;21:i39–49.
14. Stewart M, Brown JB, Donner A, *et al*. The impact of patient-centered care on outcomes. *J Fam Pract* 2000;49:796–804.
15. Barr DA, Semple L, Seaton RA. Self-administration of outpatient parenteral antibiotic therapy and risk of catheter-related adverse events: a retrospective cohort study. *Eur J Clin Microbiol Infect Dis* 2012;31:2611–9.
16. Eaves K, Thornton J, Chapman AL. Patient retention of training in self-administration of intravenous antibiotic therapy in an outpatient parenteral antibiotic therapy service. *J Clin Nurs* 2014;23:1318–22.
17. Matthews PC, Conlon CP, Berendt AR, *et al*. Outpatient parenteral antimicrobial therapy (OPAT): is it safe for selected patients to self-administer at home? A retrospective analysis of a large cohort over 13 years. *J Antimicrob Chemother* 2007;60:356–62.
18. Goodfellow AF, Wai AO, Frighetto L, *et al*. Quality-of-life assessment in an outpatient parenteral antibiotic program. *Ann Pharmacother* 2002;36:1851–5.
19. Coulter A, Cleary PD. Patients' experiences with hospital care in five countries. *Health Aff* 2001;20:244–52.
20. Guest G, Namey E, McKenna K. How many focus groups are enough? Building an evidence base for nonprobability sample sizes. *Field methods* 2017;29:3–22.