

Evaluating patient attitudes to increased patient engagement with antimicrobial stewardship: a quantitative survey

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Background: Antimicrobial stewardship (AMS) describes interventions designed to optimize antimicrobial therapy, minimize adverse treatment consequences and reduce the spread of antimicrobial resistance (AMR). Previous research has investigated the patient's role in healthcare infection prevention but the patient's role in AMS has not been extensively explored.

Objectives: To investigate the willingness of hospital inpatients to question staff about prudent antimicrobial use in an Irish hospital and evaluate the impact of patient and public involvement in research (PPI) on this study.

Methods: A survey was co-designed with the hospital Patient Representative Group (PRG) to evaluate patient willingness to engage with prudent antimicrobial treatment. A random sample of 200 inpatients was selected to self-complete the survey using pen and paper. PRG members provided feedback on their involvement.

Results: Of the 200 inpatients randomly selected to participate, 120 did not fulfil the inclusion criteria. Of the remaining 80, 67 participated (response 84%). Median respondent age was 58 years, 30% were employed and 30% had a third-level education degree. Over 90% had not heard of AMS while just over 50% had not heard of AMR. Patients preferred asking factual questions rather than challenging ones but did not have a preference in asking questions of doctors compared with nurses. Older patients were less likely to ask questions. PRG members reported an overall positive experience as research collaborators.

Conclusions: Future patient-centred AMS interventions should empower patients to ask about antimicrobial treatment, in particular the older patient cohort. PPI is a valuable component of patient-centred research.

Introduction

The burden of antimicrobial resistance (AMR) is a continually developing global health concern and is predicted to worsen.¹ One of the major drivers of AMR is the suboptimal use of antimicrobials, which is particularly important in human healthcare.²

Antimicrobial stewardship (AMS) is an effective method of directing optimized antimicrobial therapy.^{3,4} Institutional leaders' support, multidisciplinary involvement, education, prospective audit and feedback and enablement measures to support antimicrobial restriction policies are all recommended pillars of effective hospital AMS programmes.^{3,5} These structural interventions rely on institutional policy, procedures and guidelines. Recently,

however, novel approaches to tackle AMR and optimize quality of infection care increasingly focus on the role of the patient.⁶⁻⁸

As a form of safety-related behaviour, the role that patient awareness and engagement play in hand hygiene (HH) and preventing healthcare-associated infection (HAI) has previously been explored.⁹⁻¹³ Empowering patients to check the HH compliance of staff is one avenue for greater patient engagement.^{14,15} However, this approach is best used with enablement measures that inform the patient that it is a safe environment for them to speak up.¹³

Patients can feel excluded from management of their infection through poor communication from healthcare professionals.⁶ Absence of knowledge is also a likely contributory factor as patients harbour misconceptions about AMR and AMS.^{16,17}

Patients also trust their hospital clinicians and receive little direction from them to actively become engaged with AMS in the hospital setting.⁸

There are some examples of efforts to recruit patients to become involved with AMS. The Joint Commission's 'Speak Up' campaign for patient safety in the USA uses visual reminders for patients¹⁸ and encourages patients to speak up and know the facts about antibiotic therapy.¹⁹ Likewise, the Choosing Wisely campaign²⁰ and the Australian Commission on Safety and Quality in Healthcare²¹ encourage patients to become involved with AMS.

However, anxiety over patients' ability to engage in this way still exists, with more work required to develop this patient role.²² Patients can be unwilling to engage directly with healthcare workers unless they are empowered with the knowledge and skills to do so.^{11,23} WHO describes patient empowerment as: 'A process in which patients understand their role, are given the knowledge and skills by their health-care provider to perform a task in an environment that recognizes community and cultural differences and encourages patient participation'.²⁴

Similar to fostering greater patient engagement with HH and HAI control, enabling patients to speak up about prudent antimicrobial prescribing is a novel AMS strategy worthy of investigation. Although some brief interventions, such as patient information leaflets (PILs) encourage patient engagement in this way,^{21,25} research is required to investigate whether patients are willing to speak up and ask questions about their infection treatment in hospital, to find out the specific information needs of patients and to explore how to facilitate empowerment to engage.

This study aimed to investigate the willingness of inpatients to engage with AMS in hospital. A cross-sectional survey design was used to gauge patient willingness to ask doctors and nurses a set of factual and challenging questions about antimicrobial therapy. It was conducted at St. James's Hospital (SJH), which is the largest academic adult tertiary referral centre in Ireland. It has approximately 950 inpatient beds and has an active AMS programme in place. The SJH Patient Representative Group (PRG) co-designed the survey tool as a patient and public involvement in research (PPI) strategy.

Patients and methods

This study was designed in accordance with similar studies by Seale et al.¹¹ and Davis et al.²⁶⁻²⁸ who investigated willingness of patients to engage with patient safety in hospital. Randomization procedures were performed in Microsoft Excel.

Ethics

The SJH Research and Innovation office (ref. 5049) and the SJH/Tallaght University Hospital joint research ethics committee (ref 2018/6 Chairman's Action 4) approved the study.

PPI

Background information on AMR and AMS was provided to the PRG. The PRG members reviewed a draft of the survey tool, which was further refined based on their feedback. The PRG members' impact of being involved in this study was measured: (i) using a feedback questionnaire,²⁹ and (ii) through a reflective session where the group discussed the successes and positive experiences of being involved and provided opinion on areas that could be improved.

Survey instrument

Following a set of demographic questions, willingness to ask five factual and four challenging questions of doctors and nurses was measured on a five-point Likert scale. These factual and challenging questions were chosen based on two PILs on appropriate antimicrobial use in hospital^{21,25} and were aligned to aims and objectives of AMS.³⁰ The survey tool is provided in Figure S1 (available as [Supplementary data](#) at JAC-AMR Online).

Badges and posters have been previously utilized to encourage patients to speak up about HH in hospital.¹³ Two empowerment messages (a poster and a badge), designed *de novo* by the research team, were included in the survey. Participants rated their willingness to ask the five factual and four challenging questions both before and after viewing these messages.

The final order of the question items on each copy of the survey tool was randomized to prevent participant recall bias and each patient was randomly assigned a survey with either a badge or poster message.

Study design and procedure

Two members of the research team distributed the surveys and participants self-completed the survey with pen and paper.

Sample size

The aim was to recruit 80 patients to this study, in line with similar exploratory studies by Davis et al.^{26,27}

Inclusion criteria

Patients were randomly selected from inpatient wards. The specialization of these wards included medical ($n = 10$), surgical ($n = 6$), care of the elderly ($n = 5$), malignant disease treatment ($n = 2$) and a mixture of medical/surgical ($n = 2$). Other inpatient wards were excluded as patients would likely be unable to participate (for example, in critical care).

Patients were eligible to participate if they were aged over 18 years, lucid, able to speak English and were able to provide consent to participate. Patients who were healthcare professionals were excluded to avoid bias in the form of an 'informed patient'.^{26,31} Patients whose participation was unlikely or inappropriate in the context of illness severity were also excluded.

Data management

Data were collated in Microsoft Excel and imported to SPSS (IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY, USA) for further analysis. Patient demographic characteristics were reported as proportions of categorical variables. 'Factual' and 'challenging' scales were constructed as composites of the five factual and four challenging questions. Willingness to answer factual, compared with challenging, questions was investigated as well as willingness to ask questions of doctors compared with nurses. Visual inspection revealed a non-normal distribution of the Likert scale data. Results were reported descriptively and analysed using Mann-Whitney U and Wilcoxon signed-rank tests.

Conduct and reporting

The overall study was reported in line with good practice in the conduct and reporting of survey research.³² PPI impact was reported according to the Guidance for Reporting Involvement of Patients and the Public (GRIPP2) short form checklist.³³

Results

Some 200 randomly selected patients were screened for suitability to complete the survey, of whom 120 were unsuitable for reasons described in Table 1. Of the remaining 80 potential participants, 67

Table 1. Reasons why selected patients were excluded

Reason	N	%
Cognitive impairment	50	42
Unwell	30	25
Not at bed	15	13
Other	7	6
Sensory impairment	6	5
Nurse advice	5	4
Sleeping/sedated	5	4
English not first language	2	2

consented to complete the survey (response rate 84%). Of those 67, 8 did not complete the full consent form and 2 patients did not return surveys. A total of 57 surveys were analysed. The median age of respondents was 58 years (range 18–82 years). Participant demographics are provided in Table 2.

High levels of internal consistency (reliability) were achieved for factual and challenging scales. Cronbach’s alpha scores for these scales ranged from 0.724 to 0.895 (Table S1).

Willingness to ask questions

Before viewing the empowerment message, all respondents reported a greater willingness to ask factual questions than challenging ones ($z = -2.839, P = 0.005$). Participants aged 65 years and over were less likely to ask factual ($U = 216, P = 0.005$) or challenging ($U = 214.5, P = 0.006$) questions than those aged less than 65 years.

Effect of empowerment message

Twenty-eight patients (49%) received a survey with a poster message and 29/57 (51%) received a badge message. Viewing the message did not significantly alter willingness of participants to ask factual ($z = 1.170, P = 0.242$) or challenging ($z = 0.526, P = 0.599$) questions.

Effect of staff member

There was a trend towards a preference for asking factual questions of doctors compared with nurses, but this was not significant ($z = -1.755, P = 0.079$). There was no significant difference in participant preference to ask challenging questions of doctors compared with nurses ($z = 1.109, P = 0.268$).

Effect of other variables

Factual or challenging question scores were not significantly different between male and female participants or between those with and without a third-level degree. There were no significant differences in responses, for either factual or challenging questions, between participants prescribed an antimicrobial during their inpatient stay and those who were not. Similarly, participants who were in employment did not have significantly different

Table 2. Patient demographics

	N	%
Demographic variables		
gender		
male	30	53
ethnicity		
white Irish	51	89
other white background	3	5
other	2	4
white Irish (Traveller)	1	2
employment status		
retired	19	33
employed	17	30
unemployed	9	16
registered disabled	6	11
student	3	5
other	3	5
highest education level achieved		
secondary school	29	51
undergraduate degree	15	26
primary school	8	14
postgraduate degree	2	4
question not completed	2	4
no qualifications	1	2
Antimicrobial use and knowledge		
currently prescribed antimicrobials		
yes	29	51
no	21	37
did not know/question not completed	7	12
heard of term ‘antimicrobial stewardship’		
no	52	91
yes	3	5
question not completed	2	4
heard of term ‘antimicrobial resistance’		
no	31	54
yes	24	42
question not completed	2	4
heard of need to reduce antimicrobial use		
yes	39	68
no	15	26
question not completed	3	5
hospital admissions in last 5 years		
median (range)	2.5 (0–15)	
did not know/question not completed	5	9
antimicrobial prescriptions in last 5 years		
median (range)	4 (0–15)	
did not know/question not completed	18	32

scores for factual or challenging questions compared with those who were not employed.

Open item question

The final item on the survey invited participants to provide any additional comments as an open question. A transcription of

these comments is in Appendix S1. The comments were analysed thematically and three themes emerged:

- (i) Inpatients assume that best antimicrobial prescribing practice is being followed in hospital:
'Where I have put 'uncertain' it's because I assume the medical staff know what they are doing.' (illustrative quotation)
- (ii) Inpatients can be reluctant to question medical staff:
'Don't understand why you're asking the question re changing antibiotics from IV to tablets. Surely this would be a medical decision and it may encourage people to compromise their medical needs if they push for the oral option before it's appropriate to do so.'
- (iii) Patients would prefer that antimicrobial agents are prescribed prudently:
'Antibiotics should be stopped as soon as patient is feeling well. And not full course of antibiotics as patients are becoming more resistant to these medications.'

PPI impact

Seven members of the PRG participated in the survey co-design. Comments and suggested changes to the layout of the survey were taken into account during drafting of the final survey version. The changes related to: syntax structure; increasing readability of the participant information sheet; clarification of question items; colour and clarity of the empowerment messages; emphasis of the words 'doctor' and 'nurse' to highlight direction of questioning to the participant; and general layout of the tool.

Four members of the group returned the experience assessment questionnaire. A portion of one PRG monthly meeting was allocated to PRG feedback on their experience of being involved in the study. The responses are presented in Tables S2 and S3. Members reported an overall positive response to their involvement in the study and identified areas for improvement such as more background reading on the subject and to gather feedback more promptly.

Discussion

Previous studies have investigated patient willingness to raise questions about their healthcare in hospital^{26,27} and enablers and challenges to patient awareness and engagement in HH and preventing HAI.⁹⁻¹³ However, infection prevention and control is only one way to control the spread of AMR. There is a paucity of published studies to investigate dynamics of engaging patients with AMS in hospitals. To the best of our knowledge, this is the first study to evaluate patient willingness to interact with healthcare staff, specifically about antimicrobial treatment in hospital, through framing questions from both factual and challenging standpoints.

Some participants in this study assumed that best practice was being followed with regard to antimicrobial prescribing and some expressed surprise with the suggestion that they should question it. This aligns with previous research where patients do not perceive themselves as at risk to suboptimal antimicrobial prescribing in hospital, have a large degree of trust in their hospital clinicians

in that regard and receive little direction from them to actively become engaged with AMS in the hospital setting.⁸

Respondents were also largely unaware of the term 'antimicrobial stewardship' and approximately half of respondents were unaware of AMR. But, when framed in a different way, the majority were aware of the need to reduce antimicrobial use in healthcare settings. For the lay individual, the term 'antimicrobial stewardship' may be a difficult concept to interpret and also speaks to the issue of health literacy and indeed literacy in general. Just over half of our patient sample was educated to second (high school) level only, while 14% were educated as far as primary school alone. Health literacy has important implications for infection management and antibiotic use^{34,35} and, as found in this study, reframing information (i.e. 'antimicrobial stewardship' versus 'the need to reduce unnecessary antibiotics in healthcare') enabled patients to better comprehend that information.

Patients were more comfortable asking factual-based questions than challenging ones, which has been previously reported.²⁷ With increasing age, patients were less inclined to ask questions of hospital staff. Employment or education status were not found to have affected question scores but Davis et al.²⁷ previously found that patients with higher education levels and who were in employment were more willing to ask questions about healthcare quality in hospital. Previous research has also suggested that, in terms of raising questions about their treatment, hospital inpatients view and interact with doctors in different ways than with nurses.³⁶

Recruiting patients to become more engaged with their care can be a sensitive endeavour. Patients may express anxiety at performing certain tasks and shoulder additional responsibility to participate in this way.³¹ While the evidence points to improved healthcare outcomes for the more involved patient,³⁷ they also require support and empowerment measures to facilitate this.³¹ McGuckin and Govednik³⁸ previously reported that patient empowerment is enabled when endorsed by healthcare staff. The endorsement messages included in the survey tool did not affect the willingness of participants to speak up.

Some 60% of patients randomly selected and screened for inclusion in this study did not satisfy the inclusion criteria. This highlights an important issue about the applicability of interventions to increase patient engagement as these interventions can only be used by those who are physically and cognitively able. One patient described the potential difficulty around engaging with staff due to feeling unwell after surgery. Health status of patients is an important determinant of patient interaction in this way.³⁹ Patients' families and extended patient networks may have an auxiliary role to play as advocates for patients in these situations.

PPI

Recent inclusion of PPI in infection-related research^{10,40} highlights the importance of increasing research quality by engaging patients and the public. While not all of the PRG returned feedback, members broadly reported a positive experience of being involved in the research process. Efforts were made to provide sufficient background material to the PRG members to enable them to participate in the research activity, such as visual presentations and printed documentation. There was some contradiction between

members' feedback. For example, one member suggested more pre-reading material would be beneficial while another member reported that the study was explained well. This highlights a need for more periodic feedback from the PRG in future research involvement to ensure that their information needs are met and that they are up to date with the research progress.

Strengths and limitations

The empowerment messages used in the survey were designed *de novo* by the research team and reviewed by the PPI group. However, more work is needed to develop these messages. For example, they could be further piloted and delivered through other methods such as video or to patients' personal communication devices. Following on from this study, a series of focus groups at SJH will aim to co-design empowerment material for patients to enable them to speak up about antimicrobial treatment in hospital. These focus groups will utilize co-design principles where both patients and hospital staff will have input to the design of these interventions.

Patient willingness to engage with patient and medication safety-related behaviour to improve the quality of antimicrobial prescribing in hospital is only one aspect of this communication paradigm. Other aspects that were not evaluated in this study include patient feelings such as worry or dread about interaction and measures of self-efficacy.³⁹ Also, patient-reported willingness to participate in an activity does not always translate into action.^{11,39} Further research is required to firstly design tools and resources to empower patients to engage with health systems and to evaluate the validity and sustainability of these tools in practice. Further work should also consider how receptive staff would be to the more actively involved patient. A follow up study in SJH will, through semi-structured interviews, evaluate hospital doctors' perceptions of increased patient engagement with AMS.

Gender, education and employment status were not significantly associated with willingness to speak up in this study, which is contrary to previous research.²⁷ However, a larger sample size and further research should evaluate these issues in more detail.

Conclusions

Future interventions to engage patients with AMS should be designed in cooperation with patients and evaluated in practice to investigate how these interventions interact with systems and workflows and ensure that hospital staff can appropriately facilitate and acknowledge this increased patient role in their healthcare. PPI is an important component to research activity, as found in this study. By increasing the patient role in research, patient trust and confidence in healthcare systems can be enhanced, which results in a more patient-centred approach to health research activity.

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Transparency declarations

None to declare.

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Supplementary data

Reviewer report 1, [Figure S1](#), Appendix S1 and [Tables S1 to S3](#) are available as [Supplementary data](#) at JAC-AMR Online.

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