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Understanding antibiotic-seeking behaviour: A qualitative case study of mothers of children aged 5 and under

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Abstract

Background: Antibiotics savelives and have been effectively and reliably used for decades to treat infections and improve health outcomes. This trust in antibiotics has contributed to over prescribing and the emergence of antimicrobial resistance. Significant amounts of antibiotics are still widely prescribed and taken, especially in young children. However, there is a paucity of existing literature relating to how mothers, who are the main carers of young children, may be influenced by their trust in antibiotics.

Aims: To explore what factors influence mothers' decisions to seek antibiotics for their young children.

Design: Qualitative case study using postcode boundaries.

Methods: Thematic analysis of qualitative data from mothers of children under 5, recruited via community playgroups within the case. Data were collected between October 2018 and May 2019, from six focus groups ($n = 19$) and one-to-one interviews ($n = 14$). Thematic analysis of the data consisted of six phases: data familiarization; generating initial codes; searching for themes; reviewing themes; defining and naming themes; and producing the report.

Results: Mothers were influenced by their belief and trust in antibiotics. Antibiotics were identified as symbolic of recovery, healing and of providing protection and safety.

Conclusion: By understanding the symbolic power of antibiotics on maternal decision making, all antibiotic prescribers may be able to offer and provide reassuring alternative and acceptable treatment options to mothers, rather than using antibiotics.

Impact: This paper introduces the concept of antibiotics as powerful symbols which influence antibiotic seeking behaviour. This in turn may result in inappropriate use of antibiotics which contributes to the risk of antimicrobial resistance developing. Although the majority of antibiotics are still prescribed by doctors, the number of nurse prescribers has been increasing. Therefore, an increased awareness of antibiotic

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symbolism, in all prescribing clinicians, is important to enable future local and national strategies to be developed, to support maternal decision making and reduce antibiotic seeking behaviour.

KEYWORDS
antibiotics, children, motherhood, mothers, nurse prescribers, nursing, safety, symbolism

1 | INTRODUCTION

Antibiotics are a key component of modern healthcare and have saved countless lives (HM Government, 2019). The efficacy of antibiotics has resulted in a steady increase in usage worldwide (Van Boeckel et al., 2014), and antibiotics are routinely used to treat bacterial infections, to promote animal health and in food production (O'Neill, 2016). This has led to the emergence of antimicrobial resistance (AMR), which is estimated to cause 10 million deaths worldwide by 2050 (O'Neill, 2016). It is predicted that in terms of lost global production, between now and 2050, AMR infections will cost in excess of $US100 trillion. As a result, AMR is developing faster than new antibiotics are being produced and is considered to be one of the most significant threats to public and patients' safety worldwide (World Health Organization [WHO], 2018).

In the United Kingdom (UK), nearly three quarters of antibiotics (71.4%) are prescribed in the general practice (GP) setting (Public Health England [PHE], 2019). Young children often present in primary care with an acute illness, such as coughs, colds and ear infections (Neill et al., 2015). This age group are often exposed to circulating viral illnesses, from contact and interaction with other potentially infectious children, via nurseries or playgroups (Rooshenas et al., 2014). However, despite these illnesses often being self-limiting and viral in origin, for which antibiotics are ineffective (De Bont et al., 2013), up to 50% of all consultations, for young children, result in antibiotic prescriptions (Hawker et al., 2014). Although most antibiotic prescriptions are issued by doctors, there has been a steady increase in the number of nurse prescribers (Ness et al., 2015), therefore the findings from this paper have real implications to nursing practice.

The decision to seek medical treatment for an unwell child is often taken by the mother, who is generally the primary care provider. Though research exists regarding maternal attitudes to using antibiotics (Cabral et al., 2016), to our knowledge, there is no research exploring what factors may drive maternal antibiotic seeking behaviour, including the symbolic power of antibiotics. The findings of this paper were identified from a larger study exploring mothers' experiences and expectations of seeking antibiotics in primary care to treat their children aged 5 years or under.

1.1 | Background

Antibiotics have been widely used since the 1940s and have an impressive track record for being an effective treatment option. Few people in today's society can remember life without them, including clinicians, who trust and rely on antibiotics to treat their patients, especially the more vulnerable ones (Courtenay et al., 2019).

Previous systematic reviews of parental attitudes and knowledge of antibiotics identified that parents wanted reassurance and advice regarding children's illnesses, they were influenced by personal past experiences (Bosley et al., 2018) and they had poor antibiotic knowledge (Cantarero-Arévalo et al., 2017). However, there is a paucity in research relating specifically to mothers of very young children and the symbolic meaning of antibiotics.

Symbols are used to convey ideas and shared meaning (Womack, 2005), therefore, to explore the meanings attached to antibiotics for mothers, it is necessary to gain an insight into the factors influencing and driving maternal attitudes towards antibiotic usage. There is often a false belief that antibiotics are effective against viruses (McNulty et al., 2019), and it can also be difficult to differentiate, for clinicians and the general population, whether the infection is due to a bacterium or a virus. Concerned parents may believe antibiotics provide protection against possible serious infections, especially where the perceived consequence of making a 'wrong' decision could lead to life-threatening outcomes, such as sepsis and/or death. Therefore, a mothers' own identity, health literacy and culture can also be crucial in shaping her attitudes and expectations around antibiotic use for herself and her children.

2 | THE STUDY

2.1 | Aim

The aim of this paper is to explore what factors influence mothers' decision making for seeking antibiotics for their young children.

2.2 | Design

A qualitative community case study approach was used. Some key characteristics of case study include binding the case (in time, space or activity), and use of multiple sources of data (interviews, reports). Cases can be used to describe, explain or explore everyday phenomena in their natural settings (Yin, 2014). The study was conducted in a large UK city in the South of England, and a postcode was used to bind the case (Bosley et al., 2019). There was a slightly higher unemployment rate of 6.1% within the case, compared with the national

average of 4.9%, with 13.2% of properties provided by the local authority, which was again higher than the overall average in England (7.5%) (Office of National Statistics, 2019). Qualitative data were collected from focus groups and one-to-one interviews with mothers of children under 5 years of age.

2.3 | Participants

It was estimated that a sample size of 30 participants was required based on established theory (Malterud et al., 2016). For study inclusion, mothers had to have children under the age of 5 years (high recipients of antibiotics), speak, read and understand English and provide informed consent. Mothers were recruited from local playgroups using a convenience sampling strategy. This was due to the unpredictable nature of when mothers may attend play sessions; however, every effort was made to recruit mothers from as diverse a demographic background as possible.

Thirty-three mothers gave informed written informed consent to participate in the study, which resulted in six focus groups ($n = 19$), and one-to-one interviews ($n = 14$). The participants were from the most socio-economically diverse area of a UK large city (Table 1), and their ages ranged from 26 to 50 years. The majority were White (88%), educated to degree level (76%) and British (64%), although 27% of mothers were European.

2.4 | Data collection

Mothers were offered to participate in a focus group or interview. To maximize participation, the focus groups were held during the playgroup sessions. This was also an advantage as by using an existing location/play session, mothers were familiar with the set up and environment. Interviews were conducted by the lead researcher who was unknown to the mothers, but presented herself as a nurse, researcher and mother. A topic guide (Table 2) was followed, and the guide was developed from findings of a literature review and to address the research question. Both focus groups and interviews were typically about 1 h in duration.

For the one-to-one interviews, mothers chose to be interviewed in their own home, which offered a familiar and comfortable environment. Familiar surroundings helped to facilitate a relaxed and open discussion, which supports more insightful and detailed discussion and therefore rich data collection. Confidentiality was assured and with consent, all focus groups and interviews were digitally recorded, transcribed and coded.

2.5 | Ethical considerations

Ethics approval was obtained from the sponsoring University Faculty Research Ethics Committee (February 2017) and the NHS Health Research Authority (HRA) (May 2017 application 217,969). The four basic principles of ethical research: respect for persons, beneficence, non-maleficence and justice were followed throughout the study (Beauchamp & Childress, 2013). Prior to data collection, participants were provided with written study information. The lead researcher ensured that all mothers' participation was entirely voluntary, and participants were free to withdraw at any time.

2.6 | Data analysis

Thematic analysis consists of six distinct phases, as described by Braun and Clarke (2022). The transcripts were analysed by reading, reviewing and identifying any common ideas or comments (Phase 1: Data familiarization). The process of returning to and re-reading of the data allowed the researcher to immerse themselves in the data (Braun & Clarke, 2022), enabling potential themes or patterns to be identified. All 20 transcripts were transcribed by the lead researcher, and initial codes identified (Phase 2: Generating initial codes) and assigned to similar and common points (Phase 3: Searching for themes). The codes were used to describe or highlight information that may be important or relevant to the research study (Gale et al., 2013).

TABLE 1 Characteristics of participants

Demographic characteristics	Category and number % ($n = 33$)	
Education level	Degree — 25 (76%)	Diploma — 3 (9%)
	College — 2 (6%)	Secondary School — 2 (6%)
	Doctorate — 1 (3%)	
Ethnicity	White — 29 (88%)	Black — 2 (6%)
	Asian — 1 (3%)	Mixed race — 1 (3%)
Nationality	British — 21 (64%)	European — 9 (27%)
	Asian — 1 (3%)	African — 1 (3%)
	Oceania −1 (3%)	
Age of mother	26–30 to 7 (21%) 31–35 to 10 (30%) 36–40 — 12 (36%)	41–45 to 3 (9%) 46–50 to 1 (3%)

TABLE 2 Example of topic guide questions

Knowledge	
Would your request for antibiotics be affected by your GP telling you that your child had a viral or a bacterial infection? If so, why/why not?	What sorts of things do you think antibiotics can be usefully prescribed for?
Attitudes	
• Can you tell me if you think antibiotics should be given to all children who develop a fever? Why/why not?	• How often do you completely follow all the GP's instructions and advice relating to taking antibiotics? Can you tell me more about this?
Beliefs/Perceptions	
• How do you feel about antibiotics being prescribed to children?	• What sort of things influence your decision making around the health of your child and why?

TABLE 3 Theme, sub themes and codes

Theme—symbolism of antibiotics	
Sub theme 1: Antibiotics as a safe and trusted treatment option	**Sub theme 2: Antibiotics as agents of recovery and healing**
Codes: Attitude Healthcare belief Behaviour	Codes: Influences Emotion

The data were charted using a Microsoft Excel® 2016 worksheet to indicate which interview/focus group was relevant to each theme or sub theme (Gale et al., 2013). This framework approach provided structure for the data analysis, as well as providing a practical management of large data sets (Ritchie & Lewis, 2003). It also enabled ordering and synthesis of the data, while allowing further exploration and analysis across the narratives. Codes were continuously reviewed and refined by moving back and forth across the transcripts before being finally collated into early sub themes and themes (Phase 4: Reviewing themes). Charting the data allowed a constant comparative approach, which enabled identification of commonalities and variations between the participants and across the data sets (Bryman, 2012). Emerging ideas and initial codes were then discussed with the whole research team until consensus was reached (Phase 5: Defining and naming themes). This process ensured mothers' narratives and meanings were captured and reflected, while identifying commonalities across the data set (Gale et al., 2013). The research team met regularly and discussed the analysis findings to ensure the themes were accurately reflected. During the process of analysis and returning to the data, it became apparent that the emerging themes (Phase 6: Producing the report) all had a common thread regarding how antibiotics were perceived by the mothers and the meaning they hold for them.

2.7 | Rigour

Several strategies were employed to ensure study rigour, including prolonged engagement (data was collected over 5 months), triangulation, member checking and thick descriptions (Houghton et al., 2013). To support triangulation multiple sources of data were sought, which included primary care prescribing data and local government demographic information for the case study location. Member checking involved a review of the transcripts by the research team, who held regular discussions to debate the emerging themes and findings. Data analysis included 'thick' descriptions, including accounts of the context, the research methods and examples of raw data, which contributed to transferability (Dawson, 2019). The study adhered to the Consolidated criteria for Reporting Qualitative research (COREQ) (Tong et al., 2007).

3 | FINDINGS

Data analysis identified antibiotic symbolism as a main theme with two sub themes (Table 3). Theme 1 related to the belief that antibiotics are a safe and trusted treatment option. Mothers' perceptions of antibiotics use were generally similar. In cases where there was diagnostic uncertainty, all mothers sought antibiotics as the first-line treatment. They considered antibiotics were effective in accelerating recovery and were not overly concerned regarding misuse or AMR. The second theme was antibiotics as agents of recovery and healing. Mothers generally expected to be prescribed antibiotics, and this was influenced by their perception of the illness severity and anxiety for their child's recovery.

3.1 | Antibiotics as a safe and trusted treatment option

Mothers, regardless of culture background, age and education status, spoke about antibiotics in a positive light, and sought antibiotics in the absence of a diagnosis, and for non-specific infections. Although most mothers would not routinely ask for antibiotics, there were some situations when they did.

> "I would push for it if he had a really bad cough instead of waiting… He had quite a severe illness… which was I mean it's still undiagnosed and we took some antibiotics at that time, cos he had a really high temperature." (Interview: 2).

All mothers believed antibiotics provided a safe and effective treatment option and although there was growing understanding regarding appropriate antibiotic use, all the mothers expressed the view it was the 'norm' to receive them. In one example, a mother spoke about how she had been brought up in Africa, where antibiotics were readily given, and associated with life and death. Therefore, she associated the power of antibiotics as symbols of life-saving treatment and found it difficult to change her personal expectations of receiving antibiotics.

> "Everything is antibiotics and I used to know that if you don't get it, you might die…the doctors will give them to you easily. So, when you know the doctor didn't give you, you start panicking you might die." (Interview:13).

Mothers trusted antibiotics to actively resolve their child's illness. There was a belief that antibiotics speed up recovery, reduce symptom duration and provide protection against the development of possible complications. This resulted in some mothers expressing feelings of anxiety if antibiotics were not readily available to them and that by not giving antibiotics, serious complications could develop.

> "Sometimes I feel no I need this tackled now, because he's had this a couple of times and we've waited a couple of times, and it didn't work, so in that situation no I want them straight away." (Interview: 6).

The findings identified mothers had some awareness relating to the risks associated with overusing antibiotics and how this was linked with the development of AMR; however, it was not well understood. Primarily mothers associated AMR as a wider public health issue and did not connect how an individual's antibiotic usage contributed to the overall incidence of AMR rates. For example, one mother expressed she was not concerned about using antibiotics as she felt they had not been taken enough by their family to contribute to AMR development.

> "I don't take (antibiotics) and as a family we don't take antibiotics so often so I don't think we will get that (resistance). I don't remember the last time I get antibiotics." (Interview: 7).

Mothers were aware of the importance of finishing the antibiotic course but were not generally concerned about AMR. It may be more difficult for mothers to relate the risks of AMR, which has a less tangible impact versus the physical impact of antibiotic side effects.

> "I'm not concerned about giving them…. I will give them if they make my baby better." (Interview: 6).

Mothers overwhelmingly reported they would not hesitate to give antibiotics if advised to by a healthcare clinician or they felt their children needed antibiotics to recover. Their anxiety for their children's recovery overrode any caution about possible inappropriate antibiotics usage or risk of AMR.

3.2 | Antibiotics as agents of recovery and healing

Mothers associated antibiotics with recovery, especially when treating recurring infections, which had required antibiotic treatment.

> "My son is prone to tonsillitis and my doctor generally likes to give him antibiotics for it, so when I call up, they say ok we'll send over a prescription for some antibiotics, and we don't even generally go in anymore." (Focus Group: 3; P1).

However, the findings suggested the symbolic power of antibiotics may shape maternal beliefs towards antibiotic use, including cultural beliefs, and the impact of emotions and feelings on maternal behaviour and decision making. Several of the participant mothers were from countries other than the UK and they had a different experience to using healthcare services and antibiotics. This was particularly evident for mothers from countries where antibiotics were readily available and widely used (e.g., Romania). Several mothers were influenced by their own personal experience of using antibiotics, as well as feeling there was an expectation to use antibiotics, by their families.

> "While my mother, doesn't have much education and she is a factory worker and if she wasn't prescribed medication, she would think that the doctor is incompetent or there was something wrong with the doctor." (Focus Group: 4; P2).

Another consideration is the idea mothers may feel they 'should' be giving/seeking antibiotics for their child, in a bid to get their child well. This relates to the idea of being a 'good mother'. It is possible, some mothers, especially new or less experienced ones, relied on family support and advice. This sometimes led to mothers seeking a GP appointment to meet the expectation and pressure from their family.

> "He [child] had one night when his temperature went up to 39 degrees and he had a cough. My mum [grandmother] started [telling mother] take him down to the doctor, so fine we'll take him to the doctor, so she'll stop saying that. If my mum wasn't here, we wouldn't take him to the doctor. It was just for her to stop. "(Interview: 5).

The anxiety of being a first-time mother and lack of childcare experience resulted in first time mothers being more likely to visit the GP to seek reassurance and was not specific to any specific maternal age group or demographic. Mothers also spoke about meeting the expectations of others as a driving influence on their response and assessed the severity of their children's illness against other people's opinions and experiences. This included friends' experiences of severe illness, concerns over septicaemia and meningitis and any symptoms deemed out of the ordinary. Some mothers spoke about how they found it helpful to share experiences with friends or family as this helped them gauge what to expect from the GP and what they should do. Several working mothers felt they were viewed differently by society to non-working mothers, as they were less committed to the mothering role than stay at home mothers. They felt that they were expected to seek antibiotic treatment by others and therefore obtain a quick recovery for their child. Another factor contributing to the symbolism of antibiotics as agents of recovery and healing is the impact of maternal emotions and feelings on decision making. These included maternal anxiety, guilt, stress, reassurance and perception of children suffering. The biggest emotional driver on maternal decision making was anxiety, and this emotion influenced whether mothers actively asked for antibiotic prescriptions for their children.

> "We (mothers) are always scared of everything, and we go to them (GP's) because we're scared, and we don't know. So, we need to go and ask." (Focus Group: 2; P2).

Overall, mothers expressed feeling more anxious if their children were preverbal (usually under 2 years of age). They related this concern to their children's inability to express their feelings or symptoms. All mothers spoke about worrying more when the child was a baby and very young. This included the perception babies were more vulnerable and therefore at increased risk of serious illness.

These feelings of anxiety influenced mothers to seek medical treatment.

The findings also found some mothers described themselves as feeling emotional or hormonal, which they felt made them more tearful and anxious. One mother described begging a GP to prescribe antibiotics for her child when she felt antibiotics were required. This anxiety was linked to her trust and belief in antibiotic efficacy.

> "They didn't prescribe me (antibiotics) when I wanted to, the more I will panic and think she might be sick, and I really begged them when my daughter was young (to give antibiotics)." (Interview:13).

Several mothers spoke about feeling guilty for not seeking medical treatment promptly following onset of symptoms. This experience may reinforce the view that antibiotics are symbolic of recovery and therefore mothers may more readily seek antibiotics as the first-line treatment for future management of illness. These feelings were exacerbated in cases where their children were ultimately prescribed antibiotics and originated in concern that their children were suffering from the prolonged symptoms.

> "I did feel a bit guilty in the end as she did actually need (antibiotics), because then we did go back a week later, she still has a high temperature and a cough and did actually need antibiotics, so I wondered what it… whether I had you know made it worse because I chose not to take antibiotics. "(Focus Group: 1; P2).

However, the nature of the illness also affected mothers' behaviours and responses, especially if they felt their children were unwell and they were generally unwilling to wait to be seen by a GP. In this example, the mother felt strongly that her child needed antibiotics to ensure recovery.

> "I really felt strongly that she needed them (antibiotics).... I think I would stress that." (Interview:4).

This response was based on the mothers' assessment of the severity and seriousness of the illness and their perceived ability to manage symptoms effectively. The maternal trust in antibiotics to ensure recovery often resulted in maternal antibiotic seeking behaviours.

4 | DISCUSSION

Our findings suggested there were similarities regarding mothers' perception of antibiotics. These included the belief antibiotics were symbolic of safety, recovery and health protection. Antibiotic symbolism was integrated into mothers' personal belief systems, which were influenced by their interactions with others and wider societal trust in antibiotics. There were few differences in how mothers viewed using antibiotics. Some mothers expressed caution about using antibiotics but essentially viewed the perceived benefits of prompt safe recovery as outweighing any concern about AMR.

To explore the concept of antibiotics as symbols, we must explore what symbols are. Symbols are used to convey ideas and concepts which represent shared meanings (Barrett & Parker, 2006). An action, person, place, word or object can all have a symbolic meaning that is different from its literal sense and can convey an entirely different and more significant concept. Symbols may carry much deeper, latent meanings behind their patent ones and can be used to convey strong and emotive messages, having the potential to send very influential and powerful signals (Itao, 2010).

The symbolic power of antibiotics may originate from their positive public image as a reliable and effective treatment (Cabral et al., 2015). There is generally a societal perception that antibiotics are a safe treatment with few serious side effects (McNulty et al., 2007). Although there is a growing awareness regarding appropriate antibiotic use, many people still believe antibiotics can 'fix' everything, and antibiotics are often viewed as mechanisms for

ensuring a faster recovery (Bagnulo et al., 2019). A societal deep-seated faith and belief in antibiotics as 'wonder' drugs may provide some mothers with comfort and reassurance that antibiotics will 'cure' their child's illness (Zyoud et al., 2015).

The study findings identified mothers actively pursued antibiotics to aid recovery for their child. The complete trust in the efficacy of antibiotics expressed by the mothers in this study was influenced through their social interactions with others, namely clinicians, who conveyed their trust in antibiotics by prescribing them (Brookes-Howell et al., 2014). Clinician trust in antibiotic efficacy is likely to influence professional prescribing practices and may offer a safety net for clinicians. For example, in cases of diagnostic uncertainty antibiotics offer security from professional vulnerability and self-protection in case of patient deterioration, such as in cases of sepsis (Whaley et al., 2013). Clinicians may be influenced to prescribe antibiotics more liberally in children, who are generally viewed by society as more vulnerable due to an immature immune system (Cabral et al., 2015). England does have regional variation for antibiotic prescribing and higher prescribing is often linked to socio-economically deprived populations (Thomson et al., 2020), which may be considered as more at risk from complications by the GP (Kumar et al., 2003).

This research was conducted in primary care and related to medical prescribing only. However, it is worth noting the number of nurse prescribers is increasing globally and therefore further research into any potential differences in antibiotic prescribing practices, between medical and nurse prescribing would be beneficial. One difference is that nurses have longer consultations with patients leading to greater patient healthcare experience satisfaction (Laurant et al., 2018). Nurses use the consultation time as an opportunity to listen and educate patients on appropriate antibiotic use (Lawson & Flocke, 2009). Also, nurses have also been shown to be less likely to succumb to patient pressure to prescribe antibiotics and use other measures, including information, delayed prescribing (safety netting), follow up appointments as ways of avoiding antibiotic prescriptions (Ness et al., 2021).

By understanding and gaining an insight into the importance of antibiotics as symbols of recovery, healing and protectors of health, clinicians may be more able to recognize and appreciate the origins of maternal anxiety, and any subsequent antibiotic seeking behaviour. This may lead to the development, by clinicians, of different approaches to consultations, where an alternative treatment is provided and accepted by the mother, which may not be an antibiotic. This could result in reduced expectations for receiving antibiotic prescriptions from mothers, leading to less antibiotic usage and consequently a reduction in the risk of AMR development.

Antibiotics in the community are often prescribed 'just in case', especially in cases of an undiagnosed illness. Mothers felt reassured by receiving an antibiotic prescription, even if it was not ultimately required, as it provided readily available access to perceived effective and timely antibiotic treatment. Previous studies have identified that antibiotics are often accepted as necessary to treat infections, prevent deterioration in illness and prevent prolonged suffering of the child (Rousounidis et al., 2011). Some mothers may believe their child will get worse without antibiotic treatment which prevents deterioration of illness (Brookes-Howell et al., 2014). These constructs may be applied to the societal association and representation of antibiotics as symbols of safe effective treatment. The perceived threat posed by childhood illness can influence mothers to seek antibiotic treatment for their children (Cabral et al., 2015). This may be especially true if mothers are worried about serious illnesses, as they may believe antibiotics to be effective in reducing complications (Rousounidis et al., 2011). In cases, where there is an underlying health condition i.e., asthma, antibiotics can be seen as symbolic of protection from serious infections (Bagnulo et al., 2019). The impact of past experiences on an individual and societal thinking is very influential on subsequent human behaviours. In cases where antibiotics have previously provided positive outcomes, mothers may have an expectation that antibiotics will be prescribed again (McNulty et al., 2013). Thus, mothers' dependency, experience and faith in antibiotics may reflect the symbolic meaning of antibiotics as agents of protection.

The idea of being a 'good' mother has been widely debated (Johnston & Swanson, 2006) and links to the concept of a mother who is devoted to her child and puts the child's needs first (Raddon, 2002). This concept of motherhood aligns centrally with the idea of antibiotic symbolism. Antibiotics are often perceived as mechanisms for relieving symptoms and reducing illness duration (Cabral et al., 2016) and in this study mothers wanted to relieve symptoms of pain and discomfort for their children. This is supported by a study in Saudi Arabia, which identified that nearly half of mothers expected and received antibiotics for ear pain, fever and sore throats (Al-Dossari, 2013). By treating their child's infection with antibiotics, mothers may feel they are providing the best possible treatment and care (Cabral et al., 2015).

The findings identified that maternal anxiety was linked to a strong protective instinct towards their child's health. Although there is more public awareness about AMR and the importance of using antibiotics sparingly, some media messages portray antibiotics as vital in treating serious illness. An unwell child can present a very emotive image, and for example, some public health media campaigns have featured the severe and devastating outcome of meningitis for a child with the loss of limbs (Meningitis Now, 2020). For parents seeing these images, the message may convey the importance of giving antibiotics early to prevent mortality, morbidity and complications. Therefore, in this context, antibiotics represent a lifesaving treatment. This shared and widespread societal view enables antibiotics to be seen as symbolic and vital in securing a recovery from infection. Of course, the perception of illness severity will vary for each mother, but as reflected in our findings, some mothers' anxiety about their child's health resulted in antibiotic seeking behaviours. In cases where antibiotics were not prescribed or were ineffective, mothers generally still wanted to be prescribed them, just in case.

To develop effective health interventions, prescribers of antibiotics need to appreciate how influential symbols can be in

influencing maternal and societal antibiotic seeking behaviours. Interventions, which target behaviours and beliefs, including specific education and information materials, public health campaigns and messages in GP practices, need to be made more effective to engage people. Further training of nurses regarding appropriate antibiotic usage and the risks of AMR would be beneficial. It would support and strengthen their ability to provide clear messaging for mothers, informing decision making and their ability to recognize and manage children's illnesses. One approach to increasing nurses' knowledge of antibiotic usage and risks of AMR would be to incorporate specific education in continuous professional development (CPD) programmes. This additional training could be broadened to incorporate other healthcare groups including GPs, health visitors and community nurses to ensure they are able to deliver and provide support to parents.

4.1 | Limitations

All participants had completed formal education to at least secondary school and many to degree. Therefore, it is not known how less formally educated mothers would view antibiotic usage and further study would be beneficial. The socio-economic status of the participants was not collated and therefore the impact of poverty was not explored. Also, it was not clear the extent of cultural influence on antibiotics usage and further study would be beneficial. It would be useful to expand data collection to include the wider general population; however, for this study participants were reflective of the case study community, and data saturation was achieved contributing to credibility of data. A further limitation is these data are confined to mothers, and therefore further research including fathers would be of interest.

5 | CONCLUSION

This paper has identified and introduced the concept of antibiotic symbolism, and the influence this may have on antibiotic seeking behaviours. Although this paper is confined to the maternal experiences and attitudes of UK mothers, the concept of symbolism may be applicable to the wider global population. Indeed, antibiotic symbolism, as a concept, may have international implications and relevance in terms of understanding consumer attitudes towards using antibiotics.

Antibiotics can represent recovery and healing and this trust in antibiotics influences maternal expectations of treatment and interactions with healthcare services. We conclude by advocating further research into antibiotic symbolism within the wider global population to better understand its impact on antibiotic seeking behaviours. This increased awareness will enable future local and national strategies to be developed to reduce antibiotic prescribing and the development of antimicrobial resistance.

AUTHOR CONTRIBUTIONS

All authors have agreed on the final version and meet at least one of the following criteria (recommended by the ICMJE*): (1) substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data; (2) drafting the article or revising it critically for important intellectual content. HB collected the data.

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CONFLICT OF INTEREST

No conflict of interest has been declared by the authors.

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DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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