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### Research Article

# Healthcare Providers' Accounts of Parental Influence on Their Behavior With Respect to the Use of Antibiotics for Children: A Qualitative Study in China

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## Abstract

### Background

High rates of paediatric use of antibiotics by healthcare providers are a key driver of antibiotic resistance in China. Qualitative studies are increasingly used to capture provider perceptions of influences on their antibiotic-related behavior; however, very few studies have been conducted in China. We undertook a qualitative study of providers in paediatric outpatient departments, primary care and retail pharmacies to examine their perceptions of influences on their antibiotic-related behavior.

### Methods

Qualitative semi-structured interviews were conducted with 20 providers in a Chinese city of average wealth and health expenditure: 6 hospital-based paediatricians; 6 general practitioners in community health institutions; and 8 providers in retail pharmacies. Interviews were transcribed verbatim, translated from Chinese to English, and analysed using framework analysis.

### Results

Parents were the most frequently-mentioned influence on providers' antibiotic-related behavior. Parental influences clustered under

three themes: the importance of public understandings of disease and treatment within Traditional Chinese Medicine and Western medicine; parental trust; and good relationships with patients.

### Conclusion

To our knowledge, this is the first city-based qualitative study in China of providers' perceptions of influences on their antibiotic-related behavior, which points to the importance of cultural and system-level contexts: Public understandings of the human body grounded in Traditional Chinese Medicine and the role of trust and familiarity in provider-parent interactions. It suggests that information campaigns to promote appropriate antibiotic use should take account of these public understandings and be supported by a further strengthening of primary care, including remuneration systems that reward the quality of clinical decision-making.

**Keywords:** Antibiotic resistance; Familiarity; Traditional Chinese Medicine; Trust; Shanxi province

## Introduction

High rates of paediatric use of antibiotics by healthcare providers (hereafter 'providers') are a key driver of antibiotic resistance in China [1,2], where rates of antibiotic resistance to most common bacteria are particularly high [3]. Prescription rates for paediatric patients using primary healthcare and hospital outpatient clinics range from 57.7% to 80.3% [4-7], well above the 30% rate recommended by World Health Organisation [8]. Additionally, while antibiotics are officially available on prescription only [9], retail pharmacies are a major source of over-the-counter (OTC) antibiotics for children [10].

Hospitals remain the cornerstone of China's healthcare system [11] but community health institutions (CHIs), which include community health centres and smaller community health stations, and retail pharmacies are rapidly-growing sectors [12]. All providers support both Western medicine and Traditional Chinese Medicine (TCM) [12,13], a holistic knowledge system used for 2000 years to prevent, diagnose and treat ill-health [14-16]. In the context of TCM, disease indicates unbalanced *yin-yang*, caused by bodily excesses (*liuyin*) and emotions (*qiqing*) [16]. Excess bodily heat can result in inflammatory conditions, along with fever, sore throat and other symptoms. TCM treatment methods include herbal medicines and diets, while surgical procedures are seldom used [13,14].

Qualitative studies are increasingly used to capture provider perspectives on factors influencing their behavior [17,18]; in high-income countries (HICs), studies of antibiotic-related behavior (ARB) have identified parental pressure as a key influence [19]. However, few studies have been conducted in China [2,20-22]. Our search of English-language (MEDLINE Ovid) and Chinese (Chinese National Knowledge Infrastructure) databases located two qualitative studies reporting providers' perceptions of influences on their ARB, both based in rural China [23,24]. Here we present the results of a qualitative study which aimed to examine the perceptions of providers in

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paediatric outpatient departments, primary care and retail pharmacies in an urban setting in China, regarding influences on their ARB.

## Methods

The study was piloted and conducted in Taiyuan city, a medium-sized city in central China with average GDP and health expenditure [25,26]. It was approved by the Research Governance Committee of Department of Health Sciences, University of York. No incentives were offered to participants. We followed the COREQ (COnsolidated criteria for REporting Qualitative research) guidelines in reporting our study [27], including the description of the sample and the derivation of themes (Supplementary file 1).

Study sites (hospitals, CHIs and retail pharmacies) were enrolled via TZ's personal networks, a method recognized to facilitate recruitment, rapport and data validity in Confucian-based cultures [28-30]. Access to participants was secured from senior-level staff overseeing paediatric outpatient departments at two large public hospitals, six CHIs and five licensed pharmacies; one potential study site (a CHI) refused. A convenience sample of 20 participants was enrolled to achieve representation across study sites; no invited participants refused. Common themes emerged across the interviews, indicating data saturation [31].

Participants included six paediatricians from two hospitals' outpatient departments, six general practitioners (GPs) from different community health centres and stations and eight providers in five retail pharmacies (four licensed pharmacists and four counter staff). The majority of participants were female (15/20) and aged 40 to 49 (10/20) (Table 1). One-to-one interviews of 15-90 minutes were conducted using interview guide (Supplementary file 2) in participant worksites, transcribed and translated by TZ and coded using Excel and analysed by the authors using framework analysis, a method that identifies and combines themes recurring across the transcripts into an overarching framework; each transcript is then indexed using the framework themes [32,33]. Field notes were completed after each interview. Participants are identified below by provider group (paediatrician, GP, licensed pharmacist and pharmacy staff) and respondent number.

## Results

Parents were the most frequently-mentioned influence and, unlike other influences (e.g., provider facilities), were discussed by all participants. Parental influences clustered under three themes (Supplementary file 3): the importance of (i) Public understandings of disease and treatment (described by 18 participants); (ii) Parental trust (14); and, particularly for providers in CHIs and retail pharmacies (iii) Maintaining good relationships with parents (12).

## Public understandings of disease and treatment

TCM was seen to frame parental understandings of their child's health; it was both a shared knowledge system for provider-patient communication and a source of parental misunderstanding of antibiotics. Excess bodily heat, along with its associated conditions of inflammation and fever, were given as examples. Parents believed childhood fever was caused by inflammation and should not be tolerated, beliefs seen to contribute to parental demand for anti-inflammatory medication.

*'Many parents who visit here believe that there are inflammations as long as their children have a fever'* [Paediatrician 4].

*'For the general public, [they believe] anti-inflammatory drugs should be used, without a doubt, when people are suffering from the excess bodily heat (shanghuo) and [therefore having] inflammation'* [Paediatrician 5].

*'Sometimes consumers' diseases are caused by the excess bodily heat or the inflammation, so we will recommend some drugs which are helpful against excess bodily heat to them'* [Pharmacy staff 1].

Cultural understandings of fever, inflammation and anti-inflammatory medication were seen to shape parental perceptions of antibiotics; providers pointed to a common misunderstanding that antibiotics and anti-inflammatory drugs were the same. Although some antibiotics have anti-inflammatory effects, antibiotics are primarily prescribed as anti-bacterial agents [34,35].

*'The public is not clear about what it [antibiotic] is even now. ...the public still believe that an antibiotic is same as an anti-inflammatory drug and is used to treat inflammation. Actually, the thing they [the public] call 'anti-inflammatory drug' is an antibiotic'* [Paediatrician 5].

Parents located antibiotics within Western medicine. Parents distrustful of Western medicine therefore *'...refuse to use antibiotics very firmly and insist on using oral traditional Chinese medicines; they only accept traditional Chinese medicines'* [Paediatrician 4]. Conversely, trust in Western medicine was associated with mistrust of TCM; these patients *'do not trust Traditional Chinese Medicine, so they will refuse to use this [TCM] kind of drugs'* [GP 6]. Such parents regarded antibiotics, particularly imported antibiotics, as powerful drugs that could cure all diseases, and more quickly, than TCM; *'they prefer to use Western medicines as they want to recover quickly'* [GP 4].

Providers pointed to a widespread belief that antibiotics provided the only effective cure for potentially-serious childhood ailments; in consequence, parents were keen to use antibiotics when their child had symptoms like fever or cough.

	Sex		Age			Position
	Male	Female	30-39	40-49	50-	
Paediatricians	2	4	3	3	0	Physician-in-charge (middle-level)
GPs	3	3	1	2	3	GP
Licensed pharmacists	0	4	0	4	0	Licensed pharmacist
Pharmacy staff	0	4	3	1	0	Counter staff

Table 1: Participant profile.

*'Parents want to purchase antibiotics when their child has a cold or cough, yes. They are also more likely to buy antibiotics when they child is feverish, as they will become very anxious about their child'* [Licensed Pharmacist 2].

*'People nowadays like to use the western medicine [including antibiotics] just because it can cure the disease faster'* [GP 2].

Woven into these beliefs were misunderstandings of disease aetiology, progression and treatment. Parents were seen not to distinguish between bacteria and viruses as potential causes of inflammation and disease or to appreciate that some conditions resolve spontaneously without treatment.

*'Nowadays, parents always require that their child's disease should be cured very quickly when visiting a doctor. But actually, some diseases are self-limiting and their recovery needs a process; so, some diseases will recover without treatment some days later'* [GP 2].

### Parental trust

Participants in all provider groups spoke about a widespread distrust of China's healthcare institutions and the associated belief that healthcare services were delivered to generate profits for providers.

*'And now, there is a common phenomenon that patients feel that doctors aim to earn money from them, such as bringing money out of the patients' pocket and then putting it into the doctors' pocket. Therefore, patients will feel very suspicious of doctors. Yes, it seems that patients do not trust doctors, yes, a lack of trust'* [Paediatrician 5].

*'... they will feel that your attitude towards patients is not good [Laughing], or they may think that, rather than considering patients, what you wish is to slow the recovery of patients' diseases in order to make patients come more frequently and earn more money from them'* [GP 4].

*'I think the customer's demands are a factor [influencing the selling of over-the-counter antibiotics from retail pharmacies]. As we are just retailers, we need to satisfy the consumer's requirements'* [Pharmacy staff 2].

For GPs, this general lack of public trust was compounded by mistrust of the quality of primary care, including GPs' clinical skills, when compared with the hospital.

*'After all, here is only a community health centre, and trust is a problem. ...Therefore, the problem in the community health institution may be that the trust level is relatively low'* [GP 2].

Across provider groups, participants spoke about how trust was undermined if parents felt their wishes were not met. They described prescribing antibiotics for children when faced with demanding and anxious parents, citing concerns about angry patients and formal complaints.

*'For these parents [who strongly demand for antibiotics], we usually comply with their wishes because they have many ways to solve it, such as a complaint against the doctor, or the purchase of antibiotics from other places'* [Paediatrician 1].

*'For instance, when consumers cannot get the antibiotics they*

*really wanted, some of them will think that you intentionally refuse their requirements and become very angry. Moreover, they will not trust you no matter how you explain to them, and they will blame you like 'Such a poor pharmacy!''* [Licensed pharmacist 4].

### Maintaining good relationships with patients

Public mistrust in CHIs and retail pharmacies made it imperative that providers build good relationships with parents. Such parents were described as 'familiar parents' and familiarity, and the good relationships it fostered, could counter broader public distrust of CHIs and retail pharmacies. These providers indicated that their ARB differed depending on their relationship with the parent, for example, being more likely to provide familiar patients with antibiotics.

*'For our community health station, I am not familiar with other medical institutions, I will prescribe antibiotics to the returning patients who have previously had infused antibiotics at this station. For the new patients, I will be more prudent in using antibiotics because I am afraid of some emergency accidents'* [GP 6].

*'Well, they [consumers] should provide prescriptions if you don't know them. For consumers who are familiar with you, they can get any drugs they wanted. To be honest, if I am familiar with you, I will try my best, such as asking help from other people who also work at the retail pharmacies, to provide the drugs you wanted to you'* [Pharmacy staff 1].

For these groups of providers, maintaining good relationships with patients had an economic dimension. For GPs, prescribing antibiotics for children was seen to encourage parents' re-consultation which, in turn, was essential for the CHI's survival and therefore for their own livelihood. Pharmacy-based providers noted that selling OTC antibiotics was related to maintaining the pharmacy's income and making a profit. No paediatricians discussed economic concerns as influencing their behavior.

*'For the GPs in the community health institutions, one of the main characteristics of them [GPs] is that you must control patients' symptoms, and then patients will come back to your clinic when they become ill again.... if no patients come again, you will not be able to survive'* [GP 6].

*'They [consumers] can get over-the-counter antibiotics from other places even though we refused their requirement. So how can we deal with this problem?... Anyway, if you firmly refuse their requirements, they can get them from other retail pharmacies...'* [Licensed pharmacist 4].

### Discussion

While the value of qualitative studies is increasingly recognized [17,18], few have been undertaken in China. To our knowledge, ours is the first city-based study of providers' perceptions of influences on their ARB. Because qualitative studies are characterized by rich data from small samples [36-38], authors' interpretations play a particularly important role [39]. Our team included a female researcher familiar with Chinese culture and two UK researchers (male and female) from different disciplinary backgrounds. We relied on personal contacts to gain entry to study sites; because Chinese codes of conduct place primacy on personal networks, 'familiarity' facilitates fieldwork [30], including access and participant trust [40]. In contrast, methods which

rely on interviews conducted by strangers risk low response rates and social desirability bias [41,42].

Our study highlighted the importance of parental influences. Firstly, providers recognized that parents interpret disease and treatment through TCM. While not noted in other China-based qualitative studies [23,24], the importance of public understandings of TCM and Western medicine in symptom-interpretation and treatment preferences has been reported in studies in China and of other Chinese populations [43-46].

Secondly, providers noted the importance of parental trust. Parents were seen as distrusting China's healthcare institutions and having particular suspicions about CHIs, a finding in line with Duckett et al.'s national survey [47] and with evidence of a shortage of well-trained personal in retail pharmacies in China [10,48]. In qualitative studies in HICs [49,50], providers have also noted the importance of trust in facilitating parents' acceptance of their antibiotic prescribing decisions. In these studies, as in the studies in rural China, providers saw good doctor-patient relationships as important to avoid complaints [24,36,51]. The widespread concern about complaints is linked to public distrust of healthcare providers and the associated increase in mental stress and physical assault [52,53].

Thirdly for providers in CHIs and retail pharmacies, familiarity was pivotal to building trust and good provider-patient relationships. In a qualitative EU study of providers' ARB, familiarity was an influence because it was associated with knowledge of the patient's medical history and continuity of care [54]. In our study, familiarity and a good relationship had an additional economic dimension: to ensure that patients returned. Because of the professional status of hospital doctors and the funding structure of hospitals, hospital-based providers expressed no concerns about patient retention and, in consequence, about their job security and the hospitals' survival [12,47]. The workload and time pressures that result from high levels of demand for hospital appointments also provided fewer opportunities to develop 'familiarity' and therefore worry about its lack. However, primary care providers rely heavily on patient retention for their income and profit margins. These financial pressures have increased as remuneration from drug sales has fallen following the implementation of the Essential Drug List and the policies of 'zero mark-up' on drug prices in the 2009 healthcare reforms [55]. For retail pharmacies, drug sales remain their main income source, and studies have noted weak implementation of the new regulations on drug dispensing [10,23,48].

## Conclusion and implications

Paediatric antibiotic use is a major driver of high rates of antibiotic use and resistance in China. Our study adds to the limited evidence on providers' perceptions of influences on their ARB in China, and notes the importance of parental influences. Contextual factors emerged as key: Parents' understandings of disease and treatment and, particularly for providers in CHIs and retail pharmacies, the financial imperative of maintaining good relationships with them. The study suggests that measures to reduce paediatric use of antibiotics should address these cultural and system-level factors, for example through information campaigns that take account of public understandings of TCM and Western medicine and the continuing reform of China's health system. Important here are further strengthening of primary care, in line with the Healthy China 2030 plan, and of remuneration systems that reward the quality of clinical decision making.

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