

The influence of children's day care on antibiotic seeking:

a mixed methods study

Abstract

Background

Preschool-aged children are the highest consumers of antibiotics, but consult mainly for viral infections. Little is known about how day care, which is common in this age group, influences primary care consulting and treatment-seeking behaviours.

Aim

To investigate daycare providers' approaches to excluding and/or readmitting children with infections, and the consequences for parents' consulting and antibiotic-seeking behaviours.

Design and setting

Cross-sectional survey, document analysis, and qualitative interviews of daycare providers and parents in South East Wales, UK.

Method

A total of 328 daycare providers were asked to complete a survey about infection exclusion practices and to provide a copy of their sickness exclusion policy. Next, 52 semi-structured interviews were conducted with purposively selected questionnaire responders and parents using their services. Questionnaire responses underwent bivariate analysis, policies underwent document analysis, and interviews were thematically analysed using constant comparison methods.

Results

In total 217 out of 328 (66%) daycare providers responded; 82 out of 199 (41%) reported advising parents that their child may need antibiotics and 199 out of 214 (93%) reported advising general practice consultations. Interviews confirmed that such advice was routine, and beliefs about antibiotic indications often went against clinical guidelines: 24% ($n = 136$) of sickness exclusion policies mentioning infections made at least one non-evidence-based indication for 'treatment' or antibiotics. Parent interviews revealed that negotiating daycare requirements lowered thresholds for consulting and encouraged antibiotic seeking.

Conclusion

Daycare providers encourage parents to consult general practice and seek antibiotics through non-evidence-based policies and practices. Parents' perceptions of daycare providers' requirements override their own beliefs of when it is appropriate to consult and seek treatment.

Keywords

antibiotics; children; day care; general practice; infection; qualitative.

INTRODUCTION

Judicial antibiotic prescribing is an international health priority.^{1,2} Children aged ≤ 5 years have high rates of outpatient antibiotic use in developing countries, yet often present to general practice with typically viral and/or self-limiting infections.³⁻⁶ Unnecessary consultations not only exert a burden on health services, but encourage inappropriate antibiotic prescribing. GPs' antibiotic prescribing decisions can be influenced by pressure to limit consultation time,⁷ and desire to maintain satisfaction by colluding with parents' expectations for treatment.^{7,8} Understanding the background factors that encourage parents' consulting and treatment-seeking behaviours is therefore an important component of continued efforts to curtail unnecessary antibiotic prescribing.

Daycare attendance is a key source of infection transmission in under-5s, and an integral part of many parents' and young children's lives. Nurseries tend to offer care for large groups of children in purpose-built premises; 'childminders' are self-employed professionals who offer care within their own homes, generally for smaller groups of children. Nursery managers and childminders, collectively

referred to as 'daycare providers' (DCPs), make daily decisions about when to exclude and readmit children with infections. Little is known about how DCPs make exclusion decisions in practice, and the subsequent influence these have on parents' consulting and treatment-seeking behaviours. Despite having no formal medical training, DCPs are required to develop their own written 'sickness exclusion policies', which set out criteria for excluding and readmitting children with infectious symptoms. Multiple choice surveys have found that DCPs' exclusion decisions are sometimes based on proof of medical consultation or commencement of antibiotic treatment, but these insights are based on DCPs' selections of fixed-response categories informed by researchers' preconceptions.⁹⁻¹¹ Written sickness exclusion policies themselves have not yet been the subject of systematic analysis. Furthermore, little is known about DCPs' infection-management practices and their implications for parents.

This study aimed at conducting an in-depth investigation of DCPs' practices and policies on managing childhood infections, and analysing the influence this has on parents' consulting and antibiotic-seeking behaviours. The intention was to achieve this through mixed methods, including document analysis of sickness exclusion

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How this fits in

Preschool-aged children are the highest consumers of antibiotics, but consult mainly for viral infections. Day care environments are central to many young children's lives, but little is known about how day care providers manage infections, and the consequences this can have for parents' consulting and treatment-seeking behaviours. It has been found that day care providers have poor knowledge of when children are likely to benefit from antibiotic treatment, and often inappropriately encourage parents to seek antibiotic treatment through their routine practices and non-evidence-based exclusion policies. Improved day care provider knowledge of antibiotic indications could relieve one source of pressure to consult general practice and obtain antibiotics for preschool-aged children.

policies, a cross-sectional survey of DCPs' practices and/or policies, and qualitative interviews with DCPs and parents.

METHOD

Setting

The study was conducted across three sociodemographically contrasting areas of South East Wales (UK). Areas were selected on the basis of Multiple Deprivation Index data.¹² All Welsh unitary authorities (potential study areas) were compared on the basis of deprivation data relating to their constituent 'sub areas' ('super layer output areas' [SLOAs]). The first study area selected had 47% of its SLOAs with higher deprivation scores than the Welsh average, and was therefore considered to be of medium deprivation. The second and third selected study areas had 81% and 21% of their SLOAs with higher deprivation than the Welsh average, and were therefore considered to have 'high' and 'low' deprivation, respectively.

Design

This was a mixed methods study consisting of a cross-sectional survey, document analysis, and semi-structured interviews. A questionnaire survey developed for a wider study investigating daycare exclusion practices was used to generate an overview of DCPs' practices on advising parents about GP consultations and antibiotic treatment. Items from sections 1 and 3 of this questionnaire were relevant to this study (Appendix 1, available from authors). In section 1, information was collected

about daycare setting characteristics through multiple choice questions (with a space for free text responses if the 'other' options were selected). In section 3, DCPs were asked the following: 'When speaking to parents about ill children, do you ever: a) advise the child sees a GP; b) suggest the child might need antibiotics?' (each requiring a 'yes'/'no' selection). The questionnaire asked DCPs to include a copy of their sickness exclusion policy.

Questionnaire responses were used for subsequent purposeful selection of daycare settings for qualitative interviews. Interviews with DCPs investigated their usual practices in relation to managing common childhood infections and symptoms. In particular, DCPs were probed about their tendencies to discuss GP consultations and antibiotic treatment with parents. Interviews with parents investigated specific experiences of having a child excluded, and their understanding of DCPs' practices and policies.

Sampling and recruitment

Daycare settings in the UK are required to officially register with national organisations responsible for setting care standards. The Welsh organisation, the 'Care and Social Standards Inspectorate Wales' (CSSIW), has a publicly available register listing official daycare settings by region.

To be eligible, daycare settings had to provide care for children aged ≤ 5 years. Settings that provided care only before/after school were excluded. Eligibility was also assessed at the level of the individual DCP. Eligible DCPs managed and/or owned the setting and had responsibility of providing front-line childcare. Eligible parents needed to have at least one child who had been excluded on the grounds of infection.

All eligible nurseries and a 50% random sample of childminders in each area were targeted for the survey. Random selection took place by numbering all CSSIW-registered childminders in each area. A computer-based random number generator was used to identify childminders for the sample. If a randomly selected childminder was not eligible, the next on the list was contacted. After exclusions of ineligible nurseries (Figure 1), the questionnaire was dispatched to 328 DCPs (141 nursery managers, 187 childminders) in August 2009. Non-responders received one telephone reminder 2-3 weeks post dispatch.

Interview recruitment took place from November 2009 until July 2011. Questionnaire responders indicating a

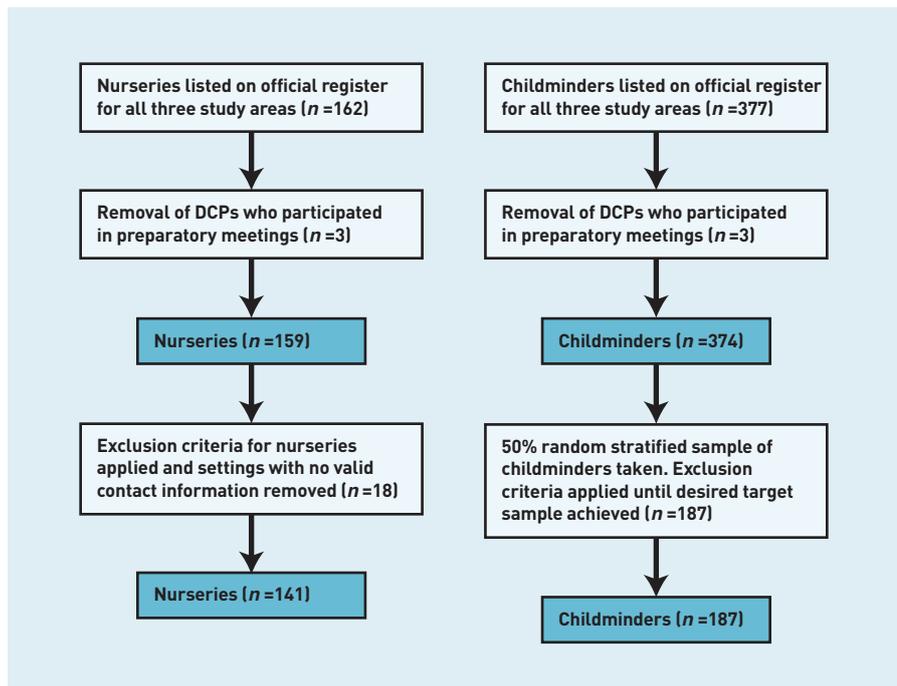


Figure 1. Flow chart showing stages in determining the final target sample for questionnaire survey. DCP = daycare providers.

willingness to participate in the qualitative study formed the sampling frame for DCP interviews ($n = 162$, 58 nursery managers, 104 childminders). A purposive sampling approach was then taken: DCPs were selected to generate a 'starting' sample that exhibited maximum variation on the basis of factors assessed through questionnaire responses and sickness exclusion policies (Appendix 2, available from authors). Sampling was subsequently informed by emerging themes, and continued until three interviews had been completed after the point of data saturation.¹³

DCP interview participants distributed letters and information sheets to all parents

registered in their settings. Parents were invited to contact a non-clinical researcher conducting interviews to discuss their eligibility. A second batch of invitations was distributed in nurseries that produced no parent responses after 1 month. Further interviews with newly selected DCPs were conducted with the intention of recruiting additional parents. This continued until the team was satisfied that data saturation had been achieved for parent interviews.

Interview process

Interview schedules were used to ensure topics were consistently covered across DCP and parent interviews (Appendix 3, available from authors). Interviews took place at the research base, daycare settings, and participants' homes. Each lasted between 20 and 50 minutes. All interviews were audiorecorded and transcribed in full. Researcher reflections, including potential sources of bias, were recorded post interview.

Developing data collection tools: questionnaire and interview schedules

Initial questionnaire and interview schedule questions were based on literature review and discussion within the research team. The relevance and clarity of questions were discussed and refined in preliminary individual meetings with six DCPs: one nursery manager and one childminder from each study area (not included in the final study sample). The multiple choice options offered in the questionnaire were finalised based on these discussions. The questionnaire was also piloted with 20 DCPs who were asked to provide comments regarding ease of completion and relevance of items. These 20 DCPs were not included in the final study sample.

Context

The regulatory body for Welsh daycare settings (CSSIW) does not provide sickness exclusion policy guidance for common infections, only providing advice for serious communicable infections (not considered in this study). Local authorities for each of the study areas were contacted at the outset of the study to enquire about any official guidance offered to daycare settings. None of the three local authorities provided any guidance, although one of the three authorities stated that they referred daycare settings to the Health Protection Agency (HPA) guidance available on the internet.¹⁴

Analysis

Sickness exclusion policies were scrutinised

Table 1. Response rates by study area and daycare provider type

Area	SLOAs with higher deprivation than Welsh national average, %	Daycare setting type	Questionnaires		Response rate, %
			sent, n	Responses, n	
Monmouthshire	21	Nursery	37	16	43
Cardiff	47	Nursery	85	51	60
Merthyr Tydfil	81	Nursery	19	10	53
All areas		Nursery	141	77	55
Monmouthshire	21	Childminder	40	31	78
Cardiff	47	Childminder	133	98	74
Merthyr Tydfil	81	Childminder	14	11	79
All areas		Childminder	187	140	75
All areas		All DCPs	328	217	66

SLOA = super layer output area.

Table 2. Daycare provider interview participant characteristics

Characteristic	Nursery managers (n = 15)	Childminders (n = 9)
Area where daycare setting based, n (%)		
Cardiff	7 (47)	6 (67)
Monmouthshire	4 (27)	2 (22)
Merthyr Tydfil	4 (27)	1 (11)
Experience of DCP, years		
Mean	13	12
Median	10	15
Range	3–24	3–24
Quartile of ranked Welsh MDI scores,^a n (%)		
1 (least deprived)	5 (33)	4 (44)
2	2 (13)	3 (33)
3	3 (20)	1 (11)
4	5 (33)	1 (11)
Funding/type of setting, n (%)		
Private, independent	10 (67)	n/a
Private, chain	3 (20)	n/a
Council or charity funded, chain	2 (13)	n/a
Size of setting,^b n (%)		
Small (<24 children/day)	3 (20)	n/a
Medium (25–48 children/day)	8 (53)	n/a
Large (>48 children/day)	4 (27)	n/a
Care for own children?^c n (%)		
Yes	n/a	2 (22)
No	n/a	7 (78)
Advise GP consultations? n (%)		
Yes	15 (100)	8 (89)
No	0 (0)	1 (11)
Advise antibiotics? n (%)		
Yes	7 (47)	4 (44)
No	8 (53)	4 (44)
No response	0 (0)	1 (11)

^aBased on postcode of daycare setting. ^bNot relevant for childminders. Childminders are only permitted to care for a maximum of six children a day. ^cChildminders sometimes care for their own children as part of their daycare group, and must count these as part of their six children a day limit.

for exclusion and/or readmittance criteria stated for specific infections. Criteria that included references to treatment were compared with national exclusion guidelines for daycare settings published by the HPA.¹⁴

Questionnaire responses were coded and analysed in SPSS (version 19). Missing answers were assigned a code denoting 'no response'. Fisher's exact *t* tests were used to determine if there were significant differences in the proportion of nursery managers and childminders who selected multiple choice options. Data were grouped this way given the potential for nursery managers and childminders to have different practices based on their different working environments.

Interview transcripts were thematically analysed using the constant comparison method adopted from Grounded Theory methodology,¹⁵ and supported through

use of NVIVO (version 9). The constant comparison method involves line by line coding of transcripts, categorising codes into themes, then developing codes and themes as transcripts are re-read in light of newly collected data, and emerging analytical insights. To reduce potential for researcher bias, there was an emphasis on searching for 'negative' cases that conflicted with emerging themes and/or theories. Analysis was primarily conducted by one of the authors, with 10% of transcripts independently analysed by another. Differences in coding and thematic interpretations were discussed and resolved, further reducing potential for researcher bias. Themes were reduced to 'major themes' towards the latter stages of data collection through discussion within the research team.

RESULTS

In total, 217 out of 328 (66%) DCPs returned questionnaires (140/187 [75%] childminders and 77/141 [55%] nursery managers [$P < 0.01$; RR 1.4, 95% CI = 1.2 to 1.6]). Response rates varied by study area (Table 1), but differences were not significant.

Copies of sickness exclusion policies were provided by 136 out of 217 (63%) DCPs (45/77 [58%] nursery managers and 91/140 [65%] childminders; differences were not significant).

Fifty-three interviews were conducted, with 24 DCPs and 29 parents. Tables 2 and 3 provide characteristics of participants.

Daycare attendance had potential to influence parents' consulting and treatment-seeking behaviours via numerous methods: written sickness exclusion policy statements; DCPs' standard practices of offering verbal advice to parents; and DCPs' thresholds for readmitting excluded children (as experienced by parents).

Sickness exclusion policy statements

Policy content. Of the 136 policies 91 (66%) mentioned specific infections and criteria for exclusion and/or readmittance. Childminder policies were more likely to consist of general statements about illness with no reference to specific infections and/or symptoms (37/91 [41%] childminder policies and 8/45 [18%] nursery policies [$P < 0.05$, RR 1.4, 95% CI = 1.1 to 1.7]).

References to treatment appearing alongside infections are listed in Table 4. Compared with HPA guidance, references to treatment were appropriate for whooping cough, parasitic infections, scarlet fever, and impetigo. All other references to treatment either went against HPA

Table 3. Parent interview participant characteristics

Characteristic	Parents (n=29)
Area where daycare setting based, n (%)	
Cardiff	18 (62)
Monmouthshire	7 (24)
Merthyr Tydfil	4 (14)
Age, years	
Mean	36
Median	36
Range	23–46
Nursery or childminder user, n (%)	
Nursery	27 (93)
Childminders	2 (7)
Quartile of ranked Welsh MDI scores,^a n (%)	
1 (least deprived)	13 (45)
2	6 (21)
3	3 (10)
4	7 (24)
Hours child uses day care, n (%)	
Full time	9 (31)
Part time	20 (69)
Single parent? n (%)	
Yes	2 (7)
No	27 (93)
Highest educational attainment, n (%)	
University (completed)	17 (59)
University (uncompleted)	2 (7)
Professional training (completed)	4 (14)
Secondary school (completed)	6 (21)
Occupational status,^b n (%)	
Higher professional	8 (28)
Lower professional	14 (48)
Lower supervisor/technical	3 (10)
Semi-routine occupation	2 (7)
Long-term unemployed	2 (7)

^aBased on parents' postcodes. ^bBased on the Office for National Statistics 2001 classification system.

recommendations or could not be assessed because of lack of official guidance. Most respiratory tract infections (RTIs) fell under these latter categories. About one-third of statements for conjunctivitis and tonsillitis inappropriately required treatment. References to treatment often appeared alongside other RTIs, including bronchitis, otitis media, and streptococcus/chest/throat infections (Table 4). The HPA has not published recommendations for managing these infections and/or symptoms.

Overall, at least one inappropriate reference to treatment occurred in 22 out of 65 (34%) policies that discussed treatment, and 22 out of 91 (24%) policies that mentioned specific infections.

Policy statements with references to treatment were also assessed against HPA guidance for their exclusion and non-exclusion recommendations (Table 5).

Exclusion recommendations for scarlet fever, whooping cough, scabies, and ringworm of the feet fully complied with HPA guidance. Most policies on tonsillitis and conjunctivitis inappropriately excluded children. Policies for RTIs not mentioned in HPA guidance all required exclusion. Inappropriate exclusions were also common for ringworm and head lice.

DCPs' and parents' perspectives on written policies. Interviews with DCPs gave a strong indication that written policies were an accurate reflection of their day-to-day practices and beliefs about exclusion and treatment indications. References to treatment appearing alongside RTIs, otitis media, and conjunctivitis were always defined as 'antibiotics' by DCPs.

Parents generally expressed that they would expect or intend to obtain antibiotics on the basis of references to treatment appearing in policies:

'I mean, if I took her to the doctors, and they diagnosed an ear infection, I'd be saying "Well, where's the antibiotics then please?'" (Parent 52)

'I think it's a reasonable policy, but it does mean that it forces parents to go to their GP and say "I need antibiotics!"' (Parent 51)

Only one parent reported that daycare policies would not influence her behaviour. This was explained by her perception of daycare policies lacking credible medical advice:

'I don't think this suggests ... or gives ME indication of how I should treat my child really, because I see this as them covering themselves. I would take medical advice from my doctor.' (Parent 22)

DCPs' verbal advice to parents

Questionnaire responses. Of 214 DCP questionnaire responders 199 (93%) selected 'yes' when asked if they ever advise parents to consult the GP (76/77 [99%] nursery managers and 123/137 [90%] childminders). Nursery managers were significantly more like to select 'yes' ($P < 0.05$, RR 1.1, 95% CI = 1.03 to 1.17; three missing responses).

When asked if they ever advise parents that their child might need antibiotics, 82 out of 199 (41%) DCPs selected 'yes' (24/70 [34%] nursery managers and 58/129 [45%] childminders; 18 missing responses). Differences between nursery managers and childminders were not significant.

Qualitative insights into advising GP consultations. DCPs reported consistently advising GP consultations for most infections, framing this as standard practice whenever a child was excluded on the grounds of infectious symptoms (with the exception

of vomiting and/or diarrhoea). This was thought to rule out serious illness, and/or to culminate in beneficial treatment, especially when DCPs anticipated a need for this:

[On discussion of advising GP consultations for chesty cough] *'At the end of the day, it's the child that's suffering. If they've got a temperature, they don't feel well — they're suffering and they need medication.'* [Childminder 12]

Advising consultations also had a facilitating effect on DCPs' working situations. DCPs wished to absolve themselves of responsibility over children's health because of fear of liability, and sought medical experts' diagnoses to confidently enforce their policies and warn other parents about transmission:

'We're not medical, and we have to be careful [...]. It's to cover our backs.' [Childminder 60]

'We have to phone and say "We THINK they might have [infection]". Well, we know they have really, but obviously you can't say that to them ... and then we just say "Can you just take them to the doctors, get them checked out and confirmed — and obviously let us know".' [Nursery manager 72]

Qualitative insights into antibiotic advice-giving. The interview sample included an even mix of DCPs who had indicated that they do or do not advise antibiotics (in their questionnaire responses). Those who did not advise antibiotics felt they were not qualified to offer 'medical' advice:

'I'm not a doctor. I would never say "Your child needs antibiotics".' [Childminder 5]

DCPs who reported advising antibiotics emphasised that they never considered antibiotic treatment as a prerequisite for readmittance to day care.

Two main forms of advice-giving emerged from DCPs' descriptions of their usual communications with parents: advising parents that children might need antibiotics, and advising parents to obtain antibiotics. In the former case, parents were encouraged to consult general practice to see if antibiotics were warranted:

'I would say to the mother, "I think she's got tonsillitis, you may need an antibiotic. I think you ought to go and visit your doctor".' [Childminder 91]

Some DCPs reported advising parents

Table 4. Infections appearing in sickness exclusion policies with accompanying references to treatment

	Infection name (as appears in policy)	Number of policies mentioning infection (% of total policies analysed) (n = 136)	Proportion of policy statements for infection that mention treatment (%)
No guidance from HPA	Strep throat	13 (10)	11 (85)
	Thrush	9 (7)	6 (67)
	Chest infection	5 (4)	3 (60)
	Bronchitis	2 (1)	1 (50)
	Throat infection	2 (1)	1 (50)
	Otitis media	15 (11)	5 (33)
Treatment references inappropriate relative to HPA	Plantar warts	14 (10)	5 (36)
	Tonsillitis	18 (13)	6 (33)
	Conjunctivitis	58 (43)	18 (31)
	Cold sore	7 (5)	0 (0)
Treatment references appropriate relative to HPA	Threadworm	16 (12)	14 (88)
	Scabies	40 (29)	34 (85)
	Head lice	37 (27)	29 (78)
	Ringworm (body)	28 (21)	19 (68)
	Scarlet fever	29 (21)	19 (66)
	Ringworm (scalp)	26 (19)	14 (54)
	Ringworm (feet)	8 (6)	4 (50)
	Whooping cough	57 (42)	12 (21)
	Impetigo	49 (36)	9 (18)

HPA = Health Protection Agency

Table 5. Exclusion requirements for infections with treatment specifications

	Infection name (as appears in policy)	Proportion of policy statements requiring exclusion (%)
HPA does not provide exclusion/non-exclusion recommendation	Strep throat	13/13 (100)
	Thrush	9/9 (100)
	Chest infection	5/5 (100)
	Bronchitis	2/2 (100)
	Throat infection	2/2 (100)
	Otitis media	15/15 (100)
Exclusion inappropriate according to HPA	Conjunctivitis	55/58 (95)
	Head lice	34/37 (92)
	Ringworm (scalp)	22/26 (85)
	Tonsillitis	15/18 (83)
	Threadworm	11/16 (69)
	Ringworm (body)	18/28 (64)
	Cold sore	3/7 (43)
	Plantar warts	0/14 (0)
	Ringworm (feet)	0/8 (0)
Exclusion appropriate according to HPA	Scabies	40/40 (100)
	Scarlet fever	29/29 (100)
	Whooping cough	57/57 (100)
	Impetigo	48/49 (98)

HPA = Health Protection Agency

to actually obtain antibiotics for infections where there was a strong expectation for treatment, most notably for conjunctivitis and RTIs with coloured discharge. In these instances, obtaining antibiotics was a clear objective of consulting:

[Discussing symptoms of discharge from eyes] *'Parents are called and they're picked up immediately, and then the parents get given some instructions. You know: "Take them to the doctor, get some antibiotic eye drops for them ..."'* (Nursery manager 2)

[Discussing coloured nasal discharge] *'So one of the things I often say to parents — I ring, and I say: "Look, I think you might need to see the doctors, as he could do with some antibiotics. Do you want to pick him up early, or ring to make an appointment for this evening?"'* (Nursery manager 23)

Some DCPs described refusing readmittance to children who had not been prescribed antibiotic treatment in line with their expectations. In these cases, the absence of a prescription was thought to indicate a failure to seek medical advice:

'Parents say "Oh he's been to the doctors." I ask "Where's the eye [antibiotic] drops?"; they say "Oh, well, you know, they said it wasn't that bad and he didn't really need any", and I say "He's still got conjunctivitis. As soon as you take him away and get help for the little one he can come back."' (Nursery manager 2)

DCPs' practices of advising antibiotics were put into context in light of the frequent misconceptions about antibiotic indications that were common among this group of professionals. In line with written policies, most DCPs believed antibiotics were indicated for conjunctivitis, tonsillitis, and otitis media. It was noted that written policies tended not to mention coughs and colds, yet these were the most common symptoms DCPs reported experiencing in interviews. DCPs did not view 'everyday' coughs and colds as 'infections', and therefore tended not to associate these with a need for antibiotic treatment. Colds and coughs reached 'infection' status, however, if accompanied by symptoms including coloured mucous and/or phlegm, wheezing, rattling noises from the chest, and raised temperature:

Interviewer (I): *'Say a little boy came into your care, and he's coughing up green or yellow phlegm ...'*

Childminder 105: *'Oh, he's got a bad chest infection then, hasn't he? It's time for mum. A cold, every child has a cold nowadays — you can understand that — but when it's like that, well, they've got an infection haven't they? Because it's green, it's an infection on the chest.'*

Nursery manager 2: *'Very often it's specific symptoms. Like greeny phlegm from coughs normally points to, you know, infection, and we do advise antibiotics for that, from doctors.'*

Parents' experiences of exclusion and/or readmittance

Over one-half of the parents interviewed had experience of consulting a GP and receiving antibiotic treatment for their excluded child. Half of these parents reported seeking antibiotic treatment solely for the purposes of preventing exclusion and/or expediting their child's readmittance to day care:

'If she wasn't in nursery, I wouldn't be putting the eye drops in, because I think they get better from washing them out with water.' (Parent 16)

Parents interviewed from three separate nurseries perceived that their DCPs required antibiotics or would lower their thresholds for readmittance if the child was taking antibiotics. Some attributed these beliefs to previous experiences of being able to return their child to day care with persisting symptoms as long as they had started taking antibiotics. Antibiotic treatment was viewed as a means of bypassing exclusion periods that would otherwise apply:

'So you end up having the treatment even though it's...or you end up keeping them at home and not getting the treatment. I suppose at least, having had the antibiotics, we had to stay off for a few days, but then we can take the medicine in, and the child can resume, whereas if we had no treatment, we wouldn't be able to take them in. We'd be stuck.' (Parent 15)

Parent 51: *'Often the GP says "I don't think we should have antibiotics", and then he has to be completely clear for 24 hours, which obviously can take a few days.'*

I: *'So can they go back if their eye looks ...'*

Parent 51: *'Still red, but they're on antibiotics? Yeah.'*

I: *'But they can't go back if they're not on antibiotics, until it clears up for 24 hours?'*

Parent 51: *'Yes, yeah.'*

Two parents were less precise about how

they had come to hold these impressions about daycare requirements, but felt strongly that there was pressure from their DCP to obtain antibiotics:

'The doctor says this is not really conjunctivitis, and they can't do much about it. Then ... but if you don't get the drops for the eyes, your child won't be admitted back, so, you're in a situation where someone who knows nothing about medicine is actually telling you what you should be doing.' (Parent 18)

Some parents reported experiences of GPs refusing to prescribe antibiotics. In these instances, parents had sought GP notes as proof that their child should be permitted readmittance without treatment:

'The only way I could actually take him back without the antibiotics when he had slightly gooey eyes would be to get a note from the doctor.' (Parent 31)

Obtaining a note was not always a solution. Some parents described experiences of GPs sympathising with their predicaments and prescribing, despite having explained that treatment was not indicated:

'So even though I'd gone to the doctors, and got my doctor's note, um, they wouldn't have her back in. [later] Well, actually, the last time we had antibiotics, the doctor told me to just wash her eyes out ... and then I explained about the nursery and he said — because he had a child which was in a nursery — he said "Oh yes, oh yes, oh I know how it is". So he gave me eye drops, just because he knew that they wouldn't have her.' (Parent 16)

Not all participants who had experienced receiving antibiotics after exclusion reported a daycare associated pressure to obtain treatment. These parents had been recruited via DCPs who both did and did not report advising antibiotics to parents. Despite this, all of these parents could clearly recall being advised or instructed to consult general practice on exclusion.

All parents reported that they always consulted GPs when their child was excluded with an infection. Exceptions were vomiting and diarrhoea, where GP visits were not necessarily required. A commonly recurring theme was parents' perceptions that day care lowered their own thresholds for consulting GPs. Some parents saw DCPs as experts, and felt a need to comply with their recommendations:

'I think with things like the suspected chest infections, they prompted me to go to the doctor, even though I did think that she'd be ok. So, if they hadn't have said anything I don't think I would have taken her. [...] I take a lot of what they say on board because they've seen it all before. I do take their lead quite often.' (Parent 22)

Others were acutely aware that they needed to report information back to DCPs:

'I've been quite a lot, but I've been a lot more than what I would have gone if she'd not been in nursery, because they like to know what's going on.' (Parent 16)

A number of parents expressed doubt and concern over DCPs' recommendations to consult, but felt compelled to do so to ensure their child could return to day care:

'I've taken her to the doctors basically because they wouldn't allow her back, unless the doctor said, she didn't have ... I actually took her to the doctor, who was quite stroppy with me, and I said "Well, I was told to bring her".' (Parent 13)

Parents' perceptions of DCPs' requirements for antibiotic treatment also lowered thresholds for consulting:

'Yeah, so...sounds really bad, but sometimes, if I can see that his eyes are getting crusty, if it looks a bit pink, I might try and take him to the doctors to try and rule it out, and so then if it is conjunctivitis [...]. I have a note, or I've got the antibiotics, and I can give him the 2 days' worth.' (Parent 31)

In contrast with most accounts, two parents expressed how daycare attendance discouraged future consultations after what they perceived to be 'embarrassing' episodes of wasting the GP's time:

'It medicalises things, and then I feel like a fool, because the doctor says they can't do anything, and at the end, you tend to hold back from going to see your doctor.' (Parent 17)

DISCUSSION

Summary

This study found that DCPs' practices and policies can encourage parents to consult general practice and seek antibiotic treatment via multiple mechanisms, including non-evidence-based exclusion policy documents; poor DCP knowledge of antibiotic indications; broad brush

encouragement to consult general practice; and tendencies to readmit excluded children on the basis of antibiotic treatment. Parents' accounts of their experiences and perceptions of DCPs' actions or policies confirm that DCPs have an important influence on their tendencies to consult GPs and seek treatment for their children. Daycare factors most commonly act as drivers for these behaviours.

Strengths and limitations

This study, to the authors' knowledge, is the first to systematically investigate DCPs' practices and beliefs about managing childhood infections, and the consequences this has for parents.

By combining survey and qualitative methods, new concepts emerged that were not anticipated or imposed by the research team. It was possible to build dimension to questionnaire responses by considering contextual detail offered by DCPs' experiences, beliefs, and typical practices reported in interviews. Actual sickness exclusion policy documents were analysed, ensuring reported findings were based on consistent approaches to analysis.

The study was limited by the under-representation of parents using childminders. Recruiting childminder users was particularly challenging because there were fewer in the sampling frame relative to nursery users (by virtue of childminders caring for fewer families).

The qualitative findings are based on participants' reported experiences and practices rather than actual interactions, although none of the reported findings are based on isolated cases and/or experiences. The qualitative findings represent recurring themes across a varied sample, with deviant cases clearly reported.

Parents' references to retrospective events are at risk of recall bias, and all participants may have been inclined to offer socially desirable responses. DCPs may have been influenced by expectations that they should be reducing antibiotic prescribing generally, whereas parents may have been concerned about being considered inconsiderate for sending children with infectious symptoms to day care or using health services 'unnecessarily'.

Although the findings reported were inductively derived from the data as far as possible, it should be acknowledged that the process of formulating codes and themes may have been influenced by the researchers' interest in exploring antibiotic-seeking behaviours and health service use.¹⁶

Finally, although parents from a range of sociodemographic backgrounds participated, university-educated parents dominated the final sample. As a population, however, daycare users tend to be of a higher sociodemographic status.¹⁷ Findings from the DCP survey and interviews should also be transferable to other similar daycare establishments: DCPs worked in a range of settings that varied in terms of geographical location, sources of funding, and the sociodemographic groups they serve.

Comparison with existing literature

In agreement with the present findings, multiple choice surveys have found that misconceptions about indications for antibiotic treatment are common among DCPs for a range of RTIs and associated symptoms.⁹⁻¹¹ In light of recent Cochrane reviews,^{18,19} DCPs' beliefs that conjunctivitis and otitis media require antibiotic treatment are also misconceived, whereas previous studies may have assessed these beliefs as appropriate.²⁰ Furthermore, although comparisons with HPA guidance could not be made for some RTIs with reference to treatment, the National Institute for Health and Care Excellence (NICE) has advised a 'no prescribing' or 'delayed prescribing' strategy for most RTI symptoms in children.²¹

Some of the parents in the present study experienced being able to readmit excluded children to day care sooner if they had commenced antibiotic treatment, and/or felt DCPs would not permit re-entry to day care without antibiotics or a doctor's note. A small telephone survey of 36 DCPs found that 69% reported that they had made at least one exception to exclusion when a child had an antibiotic prescription for an RTI.⁹ Furthermore, 18% reported that they had requested the last child they excluded with an RTI to commence antibiotic treatment before returning to day care. The context and nature of cases are required to accurately interpret Skull and colleagues' findings,⁹ although the methodology employed did not allow for this. Findings from another survey also indicated that DCPs require antibiotic treatment for specific infections prior to readmittance,¹¹ but results were based on DCPs selecting pre-formed multiple choice phrases compiled by the researchers. It is not clear whether the survey assessed DCPs' judgement or knowledge, or their day-to-day practices and policies. The present study is unique given that actual sickness exclusion policies were analysed, and that a purposive sample of DCP interview participants were provided with an

opportunity to explain their usual practices in their own terms.

In contrast with the present findings, a 6-week longitudinal study of DCPs' exclusion records rarely included information about advising antibiotics to parents.²⁰ The main symptoms encountered by DCPs, however, consisted of fever and gastrointestinal symptoms. The present findings, alongside conclusions of others,^{10,11} show that DCPs tend to associate RTI-related symptoms with antibiotics.

It has previously been suggested that parents hold misconceptions about DCPs' exclusion and readmittance requirements.²² Parents in the present study reported actual experiences of by-passing exclusion policies with antibiotic prescriptions. DCPs' practices may have a role to play in creating and reinforcing parents' beliefs of daycare requirements. It has also been reported that parents' beliefs that antibiotics expedite readmittance to day care are associated with parents' own misconceptions about antibiotic indications.²² Parents in the present study tended to understand that antibiotics were unlikely to confer clinical benefit, but nonetheless sought treatment for practical purposes.

It was found that basic exclusion/non-exclusion recommendations in written policies often disagreed with official guidance. Surveys of North American and Israeli DCPs have reached similar conclusions.^{23,24} Inappropriate exclusion has been proposed as a trigger for unnecessary consulting or prescribing in its own right.²⁴ The present mixed method approach allowed the study to investigate these assumptions from the perspectives of parents and DCPs themselves, lending

support to these theories. DCPs consistently advised GP consultations whenever a child was excluded, and parents generally felt a need to comply with this advice. Although consultation will have been appropriate in many circumstances, it was found that parents' thresholds for consulting were lowered because of practical daycare considerations. This finding should be viewed in light of the large body of existing evidence relating to GPs' non-clinical reasons for prescribing. Consultation alone can culminate in antibiotic prescriptions if GPs make assumptions about parents' expectations,^{24,25} or face practical or personal issues (such as busy clinics or uncertainty).²⁶⁻²⁹

Implications for research and practice

DCPs' practices and policies have the potential to result in unnecessary consulting and pressure to prescribe antibiotics for many self-limiting conditions of childhood. This can have opportunistic and financial cost implications for health services, and practical or financial disadvantages for working parents. The present study findings also have public health implications, given reports of community-wide outbreaks of antibiotic-resistant infections stemming from nurseries.³⁰

Clear, consistent, evidence-based guidance on infection management needs to be made available and accepted by DCPs. Guidelines will need to consider underlying misconceptions about antibiotic treatment at the level of infections and symptoms. Parents and GPs also need to be aware of these guidelines, and if necessary, challenge DCPs' inappropriate expectations for readmittance to day care.

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Ethical approval

The study was approved by the Cardiff University Medical School Research Ethics Committee (June 2009, ref 09/34). Daycare providers and parents were informed that they would receive a monetary incentive for completing the questionnaire and/or participating in interviews (£20 and £30 respectively). All survey and interview participants provided written consent for their data to be used in this study, but all persons/organisations have been anonymised in this report. Survey and interview participants received invitation letters and study information sheets in advance of participation.

Provenance

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Competing interests

The authors have declared no competing interests.

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