



An analysis of childhood consultations in general practice: a multi-practice study

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Received: 29 August 2018 / Accepted: 4 February 2019 / Published online: 12 February 2019
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Abstract

Background The majority of illnesses in children are managed by general practitioners (GPs) and there is a need for up to date data on consultations with children in order to improve healthcare service planning and allocation of resources.

Aims To investigate the presenting symptoms, diagnoses and actions taken by the GP at consultations with children in general practice.

Methods Senior medical students on general practice placement and their GP supervisors used practice management software to collect data on 100 randomly selected patients aged between 12 months and 14 years of age in each practice. Presenting symptoms, diagnoses and actions taken by the GP for the most recent attendance in the previous 12 months were summarised by age group (1–4 years; 5–10 years; 11–14 years).

Results Data were collected from 5959 patients at 64 practices. During the 12-month study, 3241 (54%) of children had a consultation with their GP. The most common presenting symptoms were respiratory (1–4 yrs, 28%; 5–10 yrs, 39%; 11–14 yrs, 32%) and skin complaint (1–4 yrs, 13%; 5–10 yrs, 16%; 11–14 yrs, 21%). The most common actions for all age groups were prescribing (1–4 yrs, 55%; 5–10 yrs, 58%; 11–14 yrs, 56%) and providing reassurance (1–4 yrs, 53%; 5–10 yrs, 51%; 11–14 yrs, 48%). Rates of referral and requiring further investigation increased with age.

Conclusion This study provides a comprehensive snapshot of what children commonly present with in general practice, common diagnoses and the actions taken by GPs. The findings will help GPs to organise their practice systems and will inform healthcare service planners.

Keywords Attendances · Children · Consultations · General practitioners · Outcomes

Introduction

The World Health Organisation stated in 2017 that “Children represent the future and ensuring their healthy growth and

development ought to be a prime concern of all societies” [1]. The population of children aged 14 years and under is increasing in Ireland [2] and the majority of illnesses in this population are managed by general practitioners (GPs) [3].

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Caring for children is an integral part of general practice, with data from the UK revealing that over 1 in 10 consultations take place with this age group [4]. Knowledge and understanding of childhood illness are core components of general practice [5] and should be integral to its professional accreditation and programme of research [6].

GPs act as gatekeepers to other services through frequent contacts with young children and their families, while also providing opportunistic preventive care [7]. A study carried out in the Netherlands reported that the two most common reasons for children attending a GP were respiratory and skin problems, with young children aged 0–4 years twice as likely to present to their GP as older children aged 10–14 years [8]. In Ireland, it is estimated that young children consult their GP on average three times per year [9]. Major health service restructuring has recently taken place in Ireland, with free GP care recently being introduced for all children under 6 years and plans to extend this to all children under 12 years in the coming years [10]. To our knowledge, no recent study of general practice medical records has investigated morbidity patterns of children in a community setting. Such data describing morbidity patterns and actions taken by the GP is necessary in order to provide appropriate education for GPs, as well as to inform research and planning of health services. This study aims to investigate the presenting symptoms, diagnoses and actions taken by the GP at consultations with children in general practice.

Methods

All practices affiliated with the University of Limerick Graduate Entry Medical School with a senior medical student on clinical placement in 2014/15 ($n = 72$ practices) were invited to participate in this study. Practices affiliated with the School are based in three of Ireland's four healthcare regions (i.e. Dublin Mid Leinster, South, West) and are broadly representative of general practices nationally by size and patient eligibility for free care [11]. The practices that were invited to participate had similar structural and demographic characteristics to the national profile as measured by O'Kelly et al. [12]. Senior medical students on placement and their GP supervisors used reporting functions of electronic practice management systems to generate a list of all patients aged between one (to facilitate a review of 1 year of healthcare utilisation) and 14 years (the upper age for new referrals to paediatrics in many clinics). A random sample of 100 children was selected from this list in each practice using a random number function in Microsoft Excel. Children who had recently registered with the practice were excluded from the sample.

The clinical records for the sample of children over the 12-month period from 1 September 2013 to 31 August 2014 were reviewed by the senior medical student on placement and their

supervising GP. All children had information collected on their age, gender, and whether or not they had a consultation with the practice in the previous 12 months. A consultation was defined as any visit to the practice or telephone conversation that resulted in an entry to the child's records excluding out of hours' attendances which are resourced separately by out of hours GP cooperatives. Visits which were solely for routine childhood immunisations were also excluded. For those who had attended in the 12-month time period, the presenting symptoms documented at the most recent attendance (up to three symptoms per consultation), the assessment/diagnosis of the GP and the actions documented by the GP were recorded. Presenting symptoms and diagnoses were coded post hoc using the International Classification of Primary Care, second edition (ICPC-2) coding system [13]. The actions taken by the GP were categorised into providing reassurance and explanation; prescribing; referral; further investigations, e.g. a blood test; prevention and health promotion; and other.

Anonymised datasets from all practices were merged into a single database. Children were categorised into three age groups (1–4 years; 5–10 years; 11–14 years). A descriptive analysis of presenting symptoms, diagnoses and action taken by the GP was carried out for each age group. Chi-squared test for trend was used to test for associations between actions taken by the GP and age group. A 5% level of significance was used for all tests. SPSS Statistics Version 22 for Windows was used to carry out the analysis. Ethical approval for the study was granted by the Irish College of General Practitioners Research Ethics Committee.

Results

Of the 72 practices affiliated with the medical school, 64 practices (89%) participated in the study with each practice randomly selecting 100 children. Children who had only recently registered with the practice were excluded resulting in a sample of 5959 children. Of these children, 3241 (54%) had a consultation with their GP within the previous year. They were divided into three age groups: 1197 (37%) were aged 1–4 years, 1324 (41%) were aged 5–10 years and 720 (22%) were 11–14 years old. Table 1 summarises the presenting symptoms at the most recent consultation by age group. Respiratory symptoms included sinus and throat complaints, cough and wheezing. General and unspecified symptoms included fever, irritable infant and feeling ill.

Over a third of children presented with respiratory symptoms, which were common in all age groups. Children aged 11–14 years old presented with skin complaints (21%) and musculoskeletal symptoms (16%) more frequently than younger age groups. Presenting with general and unspecified

Table 1 Presenting symptoms at most recent consultation by age group

	1–4 years (<i>n</i> = 1197)	5–10 years (<i>n</i> = 1324)	11–14 years (<i>n</i> = 720)
Respiratory	451 (38%)	513 (39%)	233 (32%)
Skin	161 (13%)	212 (16%)	153 (21%)
General and unspecified	149 (12%)	101 (8%)	33 (5%)
Gastrointestinal	128 (11%)	139 (10%)	52 (7%)
Ear	69 (6%)	74 (6%)	36 (5%)
Musculoskeletal	34 (3%)	74 (5%)	116 (16%)
Other (including immune, eye, cardiovascular, neurological, psychological, urological, female or male genital)	174 (14%)	181 (14%)	89 (13%)
None recorded	31 (3%)	30 (2%)	8 (1%)

symptoms was more common in children aged 1–4 years than in older age groups.

Table 2 summarises the diagnosis recorded by the GP at the most recent consultation by age group. Over a third of children were diagnosed with respiratory conditions which were common in all age groups. Similar to the findings for presenting symptoms, children aged 11–14 years old were more commonly diagnosed with skin conditions and musculoskeletal conditions than younger age groups. The rate of general or unspecified conditions decreased with age.

Figure 1 summarises the actions taken by the GP at the most recent consultation by age group. The most common actions for all age groups were prescribing (1–4 yrs, 55%; 5–10 yrs, 58%; 11–14 yrs, 56%) and providing reassurance (1–4 yrs, 53%; 5–10 yrs, 51%; 11–14 yrs, 48%). Referrals rates were low in each age group but increased with age (1–4 years 10% vs 5–10 years 13% vs 11–14 years 15%, $p < 0.001$). Similarly, requiring further investigation increased with age (1–4 years 6% vs 5–10 years 10% vs 11–14 years 14%, $p < 0.001$). Documentation of prevention and health promotion was low in all age groups.

Table 3 summarises the presenting symptoms that generated either an onward referral to a hospital doctor or further

investigation. Patients who presented with musculoskeletal, respiratory, skin or digestive symptoms were referred onwards most frequently.

Discussion

This study analysed the clinical records of over 3000 children who attended general practice in the preceding 12 months. The most common presenting symptom and the most common diagnosis were respiratory conditions. Children were most commonly prescribed medication and given reassurance. Similarly, Bayram et al. found that between 2000–2003 and 2012–2015, upper respiratory tract infection was the most common condition in children presenting to GPs in Australia [14]. Interestingly, the rates of these presentations stayed relatively consistent between these time periods. Furthermore, in our study, skin complaints were relatively common in all age groups (1–4 yrs, 13%; 5–10 yrs, 16%; 11–14 yrs, 21%). Rübsum et al. found that there is diagnostic uncertainty among GPs in the UK dealing with patients who have dermatological problems [15]. They also found that uncertainty is reduced by referring patients to a specialist and that further training in the

Table 2 Diagnoses at most recent consultation by age group

	1–4 years (<i>n</i> = 1197)	5–10 years (<i>n</i> = 1324)	11–14 years (<i>n</i> = 720)
Respiratory	456 (38%)	511 (39%)	235 (32%)
Skin	128 (11%)	204 (15%)	151 (21%)
General and unspecified	138 (12%)	123 (9%)	40 (6%)
Gastrointestinal	100 (8%)	107 (8%)	41 (6%)
Ear	75 (6%)	69 (5%)	27 (4%)
Musculoskeletal	21 (2%)	50 (4%)	88 (12%)
Other (including immune, eye, cardiovascular, neurological, psychological, urological, female or male genital)	245 (20%)	220 (17%)	116 (16%)
None recorded	34 (3%)	40 (3%)	22 (3%)

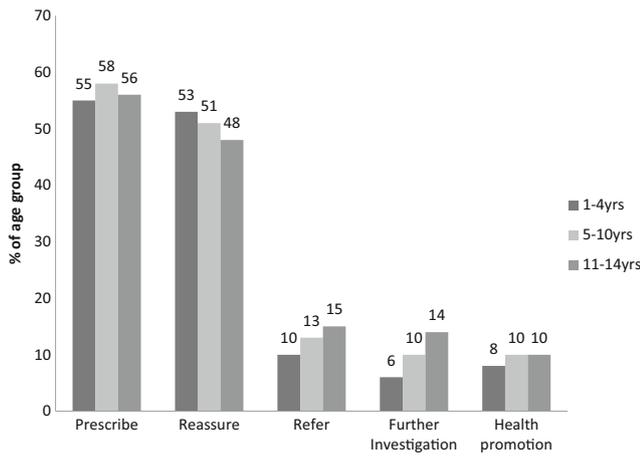


Fig. 1 Actions taken by the GP by age group: 1–4 years (*n* = 1197), 5–10 years (*n* = 1324) and 11–14 years (*n* = 720)

diagnosis and treatment of common dermatological conditions should be offered to GPs [15].

Presenting with symptoms labelled as general and unspecified was also relatively common (1–4 yrs, 12%; 5–10 yrs, 9%; 11–14 yrs, 6%). In a qualitative study of trainee GPs in the UK, Howman et al. found that managing unexplained symptoms can be difficult. They found that some GPs were fearful of misdiagnosis and struggled to tolerate uncertainty [16]. A report published by General Practice Supervisors

Australia suggested that in order to manage clinical uncertainty in general practice, the GP has to gather sufficient data from the patient on their health, identify the patient’s agenda and seek evidence [17] highlighting the importance of clinical and communication skills for GPs. Diagnostic uncertainty in the management of children in general practice has been well described and a key skill of the general practitioner is the ability to balance the risk of over investigation and referral with the risk of missing a serious diagnosis [18].

Patients in our study were commonly given reassurance by their GP (1–4 yrs, 53%; 5–10 yrs, 51%; 11–14 yrs, 48%). The ability of GPs to reassure parents and keep the children in the community takes a huge burden from the hospital services and this ‘gatekeeper role’ is well-recognised [19]. The rate of referrals to hospital doctors and for further investigations in secondary care was low. The referral rates increased with age (1–4 yrs 10% vs 5–10 yrs 13% vs 11–14 yrs 15%, *p* < 0.001) and so too did the proportion of children who required further investigations. This may be explained by the far higher rate of musculoskeletal symptoms and diagnoses among 11–14-year-old children (12% compared to 2% for 1–4 yrs) because such presentations would generally require x-rays and attendances to emergency departments. Musculoskeletal symptoms accounted for a significant proportion of hospital referrals in this study. Referral to secondary care is expensive and research has demonstrated that investing

Table 3 Onward referral and further investigations by symptoms

Total number studied <i>n</i> = 402 (100%)	Symptoms	Onward referral to hospital doctor <i>n</i> (%)
	Musculoskeletal	82 (20.4)
	Respiratory	64 (15.9)
	Skin	46 (11.4)
	Digestive	45 (11.2)
	Ear	29 (7.2)
	General and unspecified	27 (6.7)
	Other (including immune, eye, cardiovascular, neurological, psychological, urological, female or male genital)	100 (25.0)
	None recorded	9 (2.2)
Total number studied <i>n</i> = 314 (100%)	Symptoms	Further investigations <i>n</i> (%)
	Digestive	58 (18.5)
	Musculoskeletal	54 (17.2)
	Respiratory	43 (13.7)
	Skin	39 (12.4)
	General and unspecified	29 (9.2)
	Urological	26 (8.3)
	Other (including immune, eye, cardiovascular, neurological, psychological, ear, female or male genital)	57 (18.2)
	None recorded	8 (2.5)

in primary care reduces secondary healthcare utilisation and is more cost-effective [20].

Our finding that relatively low rates of health promotion occurred during childhood visits may be explained by the fact GPs may not record all information in the electronic health record [21]. The role of nurses in primary care is developing and research has shown the potential of the practice nurse to assume responsibility for triage, management of episodic illness and prevention [22], which could help practices manage children more effectively in primary care.

Strengths and limitations

This is a large multi-practice study which examines clinical records and gives us an insight into childhood consultations with GPs, symptoms with which they present and actions taken by the GPs. Participation in the study was high with 64 practices (89%) associated with the University of Limerick Graduate Entry Medical School participating. Another strength of this study is that we used clinical records of healthcare utilisation rather than self-report questionnaires that rely on recall of participants. Limitations include that only information documented in the patient's records were included so a GP may, for example, have provided information on health promotion or prevention but not recorded this in the records. In addition, a significant number of childhood consultations occur in and out of hours setting, and these were not included as part of this study. The study setting did not include out of hours and non-training practices. Out of hours settings or non-training practices may have less supports in place to aid in clinical decision-making; thus, we could not assess the decision-making of GPs in these contexts.

Conclusion

There is a high rate of reassurance and prescribing to children in general practice. The findings of this study will add to the existing knowledge on why children attended GP practice, common diagnoses for children aged 1–14 years and what actions are taken by the GP. This study should help GPs undertaking organisation reform of their practices and may guide health service planners in allocating resources for child healthcare.

Acknowledgements The authors wish to acknowledge the GPs and students who facilitated data collection for this study.

Compliance with ethical standards

Conflict of interests The authors declare that they have no conflict of interest.

Ethical approval Ethical approval was granted by the HSE Mid-West Research Ethics Committee.

Abbreviations GPs, general practitioners; yrs, years

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