Everyday symptoms in childhood: occurrence and general practitioner consultation rates

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SUMMARY

Background. *Fewer than 20% of all illnesses that occur in the home require the attention of a general practitioner (GP). Whether specific illnesses in children are more likely to need the attention of a GP is poorly understood, as is the influence of various other factors. Health diaries are the most suitable method of collecting comprehensive information about children's health problems at home and in general practice simultaneously.*

Aim. *To investigate the occurrence of, and consultation rates for, specific symptoms in childhood in relation to age, sex, birth order, and place of residence of the child, and season of the year.*

Method. *The parents of 1805 children kept a health diary over three weeks and recorded symptoms and consultation behaviour. The symptoms were later combined into illness episodes.*

Results. *Over three weeks, colds/flu (157/1000 children) and respiratory symptoms (114/1000 children) occurred most frequently. More young children (0–4 years) suffered from illness generally. Eleven per cent of all illness episodes required the attention of a GP. Consultation rates differed greatly according to symptoms. A GP was consulted most often for ear (36%) and skin (28%) problems, and least often for headaches (2%) and tiredness (1%). Regardless of symptoms, young children (0–4 years) were taken to a GP twice as often as older children (10–14 years).*

Conclusions. *This study emphasizes the enormous amount of illness that occurs in children and the fact that more than 80% of all illnesses are dealt with by parents without reference to the professional health care system.*

Keywords: children; consultation; symptoms.

Introduction

MOST children attend a general practitioner (GP) occasionally. A few studies have indicated that between 1% and 20% of all illness experienced by children at home reaches the attention of a professional health care provider.[1–4] However, whether specific symptoms are more likely to be referred to the professional health care system, or, in other words, whether the size of the iceberg is symptom specific for children, is poorly understood.

Illness in children differs from adult morbidity and should be studied separately for at least two reasons. First, hospital and primary care statistics have shown that the occurrence of illness in childhood is associated with the child's development, especially with the child's age and sex.[1] Young children experience more health problems than older children. Secondly, most children do not make their own decisions regarding health matters, especially the youngest children. Parents, mostly mothers, deal with their children's health and illness: they often recognize the early stages of illness and make daily decisions regarding these illnesses.[5] The birth order of the child influences these decisions: parents consult a GP more often for a firstborn child than for a second or subsequent child.[6] Other factors influencing the size and composition of the iceberg are seasonal and urbanization effects, e.g. colds occur more often in autumn and winter and in larger cities.[7] In this study, we have investigated whether and how these factors influence the size and composition of the iceberg of everyday symptoms in childhood.

In the Netherlands, for the professional health care of children (the visible part of the iceberg), the GP is the point of entry, being easily accessible to everyone. Preventive care is organized through baby clinics and school services. The amount of illness in children in the population at large (the part of the iceberg under the surface) is mostly estimated from retrospective interviews or medical records. Studies of medical records have demonstrated that, for children, the most frequent reasons for consulting a GP are cough, fever, earache, sore throat, and general weakness/tiredness.[8,9] For specific symptoms that can be managed by self-care or require no care, such as headaches, fever, colds, and diarrhoea, retrospective interview data provide occurrence and consultation rates.[10,11] However, these retrospective sources have several limitations,[12] such as recall bias and relevance, which probably results in overestimation of more severe problems and underestimation of less conspicuous problems. An alternative method of investigating the occurrence of symptoms is by means of prospective health diaries. The major advantages of diaries are that a more comprehensive picture of health problems can be obtained, including all minor symptoms, and that recall bias is minimized.[12]

In this paper, two questions are addressed: (1) what are the occurrence and consultation rates of specific symptoms in childhood, and (2) are the occurrence and consultation rates related to age, sex, birth order, and place of residence of the child, and to season of the year?

Method

We used health diaries, which were recorded according to the framework of the Dutch National Survey of Morbidity and Interventions in General Practice. This survey was carried out in 1987 and 1988 by the Netherlands Institute of Primary Health Care[13] and involved a sample of 161 GPs. For the health diary study, a random sample of 100 patients was selected from each GP practice list. This random sample of approximately 16 000

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persons included 2561 children aged 0–14 years. One of the parents of each of these children was asked to answer a structured questionnaire about their child and to keep a diary about the health of their child over the following three weeks. During this period, the interviewer telephoned the parents twice to motivate them or to answer questions they might have. The parents of 1805 children participated (70% response rate).

The diary was a 21-page booklet with a simple one-page questionnaire to be completed each day by one of the parents. They were asked whether their child had suffered from any symptoms that day. If so, they had to describe the nature of the symptom in their own words, with a maximum of two symptoms per day. Afterwards, the symptoms were grouped into 14 categories. The one-page questionnaire ended with a question regarding actions taken in response to the symptom. Sixteen possible actions were precoded, of which one was whether the parents had consulted the GP that day for the symptom mentioned. Later, symptoms lasting more than one day involving the same health problem were combined into episodes of illness. The occurrence of symptoms was calculated as the number of episodes reported within the three-week period. Consultation rates were based on the first consultations made with a GP within an episode and were calculated as the number of first GP consultations divided by the number of episodes of that symptom.

Children's age was divided into categories according to international standards: 0–4 years, 5–9 years, and 10–14 years. For birth order, children were divided into firstborn and later born. Degree of urbanization was determined by the number of inhabitants in the place of residence and categorized into two groups: cities with fewer than 50 000 inhabitants and cities with more than 50 000 inhabitants.

As a consequence of the design of the study, data were collected in four months spread over different seasons: June, September, December, and March.

The occurrence rates of the 14 symptom categories overall and by risk indicators are presented for each 1000 children with 95% confidence intervals. The effect of the risk indicators on consultation rates is expressed by calculating relative risks and 95% confidence intervals.

Results

More than 98% of the parents filled out the diary on more than 18 days of the three-week registration period. The parents of 1805 children reported symptoms for their children on 5147 days (13.6%). The reported symptoms constituted 1504 episodes of illness. The characteristics of the 1805 children are shown in Table 1.

Table 2 shows the occurrence rates of the 10 most frequently reported episodes in three weeks by risk indicators. Colds/flu and respiratory problems occurred most frequently, with a peak occurrence in young children. Most cold/flu and respiratory symptoms occurred in December. Diarrhoea occurred in almost 10% of all children, with higher occurrences in girls and in children living in larger cities. Musculoskeletal problems and headaches also occurred frequently, with an increasing occurrence with age. For boys, more episodes of musculoskeletal problems were reported in larger cities and in June. For typical child symptoms, such as fever, the occurrence in the youngest age group was 10-fold the occurrence in the highest age group. These episodes occurred most often in June. The occurrence of symptom, such as toothache, vomiting, and eye problems was less than 20 per 1000 children within the three-week period (not shown in Table 2).

Table 3 shows the total occurrence rates of illness by several risk indicators. In the three-week period, at least one episode of illness was reported in 599 out of 1000 children. On average, children suffered from 1.4 episodes of illness in three weeks, resulting in 833 episodes reported per 1000 children. More children aged 0–4 years were reported as suffering from illnesses than children aged 10–14 years, although older children suffered from more episodes of illness than younger children. No difference was found between boys and girls. Episodes of illness were reported more frequently for firstborn children, children living in larger cities, and in December.

The consultation rates for each symptom differed considerably (Table 4). GPs were consulted most often for ear and skin problems. One in every three children with ear problems was taken to the GP. Fever and respiratory tract problems were also often triggers to consult the GP. Despite the frequent occurrence of colds and diarrhoea, GPs were consulted in only 10% of the episodes. Headaches, stomach pain/nausea, and tiredness were seldom reasons for consulting the GP. For all symptoms, the relationship between age and consultation rates was similar. Children aged 0–4 years were taken to the GP twice as often as children aged 10–14 years. Two things are noteworthy in relation to sex. First, boys were taken to the GP more often for colds and respiratory tract problems and girls consulted the GP more often in the case of a musculoskeletal problem. Regarding birth order, degree of urbanization, and registration month, no significant variations were found (not in Table 4).

Table 5 shows the overall consultation rates. A total of 11% (194 children) of all children consulted their GP during the study period. This percentage varied according to age. Up to the age of five years, 15% of all children consulted the GP in the three-week period, whereas between the ages of 10 and 14 years only 7% of the children consulted their GP. These proportions did not vary according to sex, birth order, registration month, or degree of urbanization. A similar pattern was found for illness episodes. For episodes occurring in children aged 0–4 years, GPs were consulted 2.3 times as frequently as for children aged 10–14 years.

Table 1. Description of research population.

	Children	
	n	%
Total	1805	100
Age (years)		
0–4	575	32
5–9	621	34
10–14	609	34
Sex		
Boys	981	54
Girls	824	46
Birth order		
Firstborn	833	46
Later born	972	54
Degree of urbanization		
< 50 000 inhabitants	1494	83
> 50 000 inhabitants	311	17
Registration month		
June	487	27
September	449	25
December	426	24
March	443	25

Table 2. Occurrence rates of episodes of symptoms in children, perceived by the parents, per 1000 children in three weeks by risk factors.

	Colds/flu (*n* = 267)		Respiratory tract problems (*n* = 195)		Diarrhoea (*n* = 161)		Musculoskeletal problems (*n* = 121)		Headaches (*n* = 113)		Tiredness (*n* = 77)		Fever and other childhood diseases (*n* = 72)		Skin problems (*n*= 66)		Stomach/ nausea (*n* = 53)		Ear problems (*n* = 50)	
	Per 1000	95% CI	Per 1000	95% CI	Per 1000	95% CI	Per 1000	95% CI	Per 1000	95% CI	Per 1000	95% CI	Per 1000	95% CI	Per 1000	95% CI	Per 1000	95% CI	Per 1000	95% CI
Total	157	141–174	114	99–129	99	85–112	75	63–87	68	57–80	47	37–57	41	32–50	38	29–46	30	22–38	28	20–35
Age (years)																				
0–4	228*	194–262	134*	106–162	85	62–108	21*	9–33	3*	0–8	56*	37–74	80*	58–102	38	23–54	17*	7–28	30*	16–43
5–9	134	107–160	103	79–127	127*	101–153	55*	37–73	68*	48–87	56*	38–74	37*	22–52	45*	29–61	29	16–42	40*	25–56
10–14[a]	115	90–140	107	82–131	82	60–104	146	118–174	130	103–156	30	16–43	8	1–15	30	16–43	43	27–59	13	4–22
Sex																				
Boys	155	132–178	113	93–133	90	72–108	83*	65–100	63	48–78	50	36–64	43	30–55	36	24–47	37*	25–48	28	17–38
Girls[a]	160	135–185	115	93–137	109	88–131	66	49–82	74	56–92	44	30–58	39	26–52	40	27–53	22	12–32	28	17–39
Birth order																				
Firstborn	156	131–181	122	100–145	104	84–125	68	51–86	73	56–91	55*	40–71	47	32–61	41	27–54	31	19–43	28	16–39
Later born[a]	158	135–181	107	88–126	94	75–112	80	63–97	64	48–79	40	28–52	36	24–48	35	23–47	29	18–39	28	17–38
Degree of urbanization																				
< 50 000	163	144–181	111	95–127	92*	77–106	71	58–84	65	52–77	50	39–61	39	29–49	38	28–48	29	20–37	27	19–36
> 50 000[a]	132	94–169	129	91–166	132	94–169	93	61–126	84	53–114	32	13–52	51	27–76	35	15–56	35	15–56	29	10–48
Registration month																				
June	115*	87–143	97	70–123	84	60–109	97	70–123	66	44–88	53	33–73	66*	44–88	51	32–71	23	9–36	27	12–41
September[a]	167	133–202	111	82–140	87	61–113	73	49–98	56	34–77	56	34–77	33	17–50	42	24–61	36	18–53	16	4–27
December	178	142–215	150*	116–184	117*	87–148	59	36–81	77	52–103	40	21–58	35	18–53	31	14–47	33	16–50	40*	21–58
March	174	139–209	102	73–130	108	79–137	68	44–91	74	50–99	36	20–56	27	12–42	25	10–39	29	14–45	29	14–45

[a]Reference categories; *statistically significant deviation from reference category: $P < 0.05$.

Table 3. Occurrence rates of any illness reported by parents of 1805 children over a three-week period by age, sex, birth order, and place of residence of the child, and season.

	Children		Occurrence of any illness episode (*n* = 1082)		Number of episodes per 1000 children (*n* = 1504)	
	n	%	Per 1000 children	95% CI	Per 1000 children	95% CI
Total	1805	100	599	577–622	833	816–850
Age (years)						
0–4	575	32	640*	601–679	821	790–852
5–9	621	34	593	554–631	833	803–862
10–14[a]	609	34	568	529–607	846	817–874
Sex						
Boys	981	54	600	570–631	840	817–863
Girls[a]	824	46	598	565–632	825	799–851
Birth order						
Firstborn	833	46	616	583–649	863*	840–886
Later born[a]	972	54	585	554–616	808	783–832
Degree of urbanization						
< 50 000 inhabitants	1494	83	588*	563–613	817*	798–837
> 50 000 inhabitants[a]	311	17	653	600–703	910	878–942
Registration month						
June	487	27	577	533–621	821	787–855
September[a]	449	25	590	545–636	804	767–841
December	426	24	641*	595–686	899*	870–928
March	443	25	594	548–639	813	776–849

[a]Reference categories; *statistically significant deviation from reference category: $P < 0.05$.

Table 4. Symptom-specific consultation rates and relative risks for age and sex.

Symptoms	Consultation rates	Relative risks					
		Age (years)[a]				Sex[b]	
		0–4	95% CI	5–9	95% CI	Boys	95% CI
Colds/flu	10	3.0	0.9–10.3	2.0	0.5–7.6	2.1	0.9–4.7
Respiratory tract problems	23	1.4	0.7–2.8	0.9	0.4–2.1	1.5	0.8–2.7
Diarrhoea	10	1.0	0.4–3.5	0.5	0.2–1.7	0.7	0.3–1.7
Musculoskeletal problems	13	3.0	0.9–9.5	1.1	0.3–3.3	0.3	0.1–0.9
Headaches	2						
Tiredness	1						
Fever	24	27%[c]		27%[c]			
Skin	28	1.4	0.4–4.9	1.3	0.4–4.3	1.1	0.4–2.6
Stomach/nausea	2						
Ear problems	36	2.8	0.3–23.5	3.5	0.5–27.3	1.3	0.5–3.5

[a]Reference category: 10–14 years; [b]reference category: girls; [c]no cases in reference category.

Table 5. Percentage of children regardless of symptoms and with symptoms who consulted the GP at least once over a three-week period, and relative risks for the risk factors.

	Consultation rates of children regardless of symptoms (n = 1805)			Consultation rates of episodes of illness (n = 1504)		
	%	RR	95% CI	%	RR	95% CI
Total	11			13		
Age (years)						
0–4	15	2.1*	1.5–3.1	20	2.3*	1.6–3.4
5–9	10	1.5*	1.0–2.1	13	1.5*	1.0–2.2
10–14[a]	7	1.0		8	1.0	
Sex						
Boys	11	1.0	0.8–1.3	14	1.0	0.8–1.3
Girls[a]	11	1.0		13	1.0	
Birth order						
Firstborn	11	1.0	0.8–1.4	13	1.0	0.7–1.3
Later born[a]	11	1.0		14	1.0	
Degree of urbanization						
< 50 000 inhabitants	11	1.0	0.7–1.5	14	1.1	0.8–1.6
> 50 000 inhabitants[a]	11	1.0		12	1.0	
Registration month						
June	10	1.1	0.7–1.6	13	1.1	0.7–1.6
September[a]	10	1.0		12	1.0	
December	13	1.3	0.9–2.0	16	1.3	0.9–2.0
March	11	1.1	0.7–1.7	13	1.1	0.7–1.7

[a]Reference categories; * statistically significant deviation from reference category: $P < 0.05$.

Discussion

To our knowledge, this is the first study to describe the occurrence of, and consultation rates for, everyday symptoms in a group of children based on a prospective structured diary. Sixty per cent of all children suffered from an illness episode during the three-week study period. The most common types of illness were colds or flu and other respiratory tract problems, followed by diarrhoea, musculoskeletal problems, and headaches. One in every six children with symptoms consulted their GP during an illness episode.

Comparison of these results with previous studies is difficult, because the few studies that have reported occurrence rates of specific symptoms in children in the general population used different methods; particularly important differences are whether information about symptoms experienced is collected in a diary or from retrospective interviews or medical records, and whether the number of episodes of illness or number of days experiencing symptoms are counted. Nevertheless, the overall consultation rate of 11% that we found corresponds with consultation rates reported in other studies.[1–4] The variation in consultation rates according to different symptoms indicated that GPs were consulted more often for some symptoms than for others; notably, ear and skin problems led to GP consultations. Comparing the morbidity spectrum reported by parents with the spectrum encountered by the GPs in daily practice results in two important differences: earache is an important problem in general practice but is less often reported at home, and headaches are often reported at home but are relatively seldom brought to the attention of GPs. Parents probably perceived earache as a more severe problem (fear of hearing complaints), especially when it occurred in combination with fever. As children with earache often also experience sleeping problems, which is an additional burden for the parent, this more often results in a consultation. In contrast, headaches usually last for only a short time and seldom result in sleeping problems.

As expected, parents reported more episodes of illness in younger children than in older children, mainly resulting from colds and fever. This may be attributed to the developing immune status of the very young and their vulnerability to viral infections. However, more illnesses per child occurred in older children than in younger children, indicating that illness tends to cluster in children as they get older.[14] Older children suffered most from headaches and musculoskeletal problems, such as trauma and contusions. The occurrence rate of headaches of 12% in the oldest age group corresponded very well with the prevalence found by Abu-Arefeh and Russel.[10] Bearing in mind its effect on occurrence rates, does the age of the child also influence the decision to consult a GP? Younger children are taken to their GP twice as often as older children, regardless of their illness occurrence rates. Other studies have reported the same result.[15] Anxiety and the inexperience of the parents, especially with very young children, may be explanations, together with the biological fact that the severity of the illness varies with age.[16]

Overall differences in occurrence rates between boys and girls were small. It is notable that, although musculoskeletal problems occurred more often in boys, girls were more often taken to the GP with a musculoskeletal problem. Also, in a GP registration study,[17] the incidence rates of musculoskeletal problems were higher in girls than in boys. Parents probably perceived these injuries to be less worrying in boys than in girls.

Despite the evidence in the literature, we found no relation between consultation rate and birth order.[6] Although parents reported more episodes for their firstborn than for their later-born children, the difference was too small to yield any significant difference in consultation rates. Thus, we hypothesized that the relationship between birth order and consultation rate found in other studies may be explained by differences in perceived symptoms. Parents are probably more sensitive to symptoms in their firstborn than in their later-born children, which results in higher occurrence rates.

The season-specific occurrences of all kinds of symptoms illustrates clearly that the results of morbidity studies focusing on everyday illnesses are very sensitive to seasonal influences. Colds/flu, respiratory, and ear problems occur more often in autumn and winter than in other seasons of the year, whereas the opposite is true for musculoskeletal problems, fever, and skin problems.

Almost all parents filled out the health diary on all days. This high completion rate was probably a result of the intensive (weekly) contact between the research associate and the parents. This high completion rate would suggest that a very comprehensive picture of children's health problems was obtained.

In conclusion, we want to emphasize the enormous amount of everyday illness that occurs in children. Parents, mostly mothers, deal with more than 80% of all illnesses in their children outside the scope of the professional health care system. Education and advice for parents on how to cope with illness in their children remains very important.

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