Received: 15 December 2021 | Revised: 2 February 2022 | Accepted: 8 February 2022

DOI: 10.1111/apa.16284

ACTA PÆDIATRICA NURTURING THE CHILD WILEY

BRIEF REPORT

Cough medicine prescriptions for children were significantly reduced by a systematic intervention that reinforced national recommendations

Coughs are one of the most frequent reasons for visiting a physician during childhood. They disrupt sleep, are uncomfortable and cause anxiety for both children and their parents. It is widely accepted that cough medicines should not be prescribed, or recommended, for children.

We previously published data on cough medicine prescriptions before and after the 2014 Finnish Current Care Guidelines on children's lower respiratory tract infections (LRTIs) were published. These guidelines advice not to prescribe cough medicines to children. The data were collected from three public and two private outpatient clinics. They comprised 153 prescriptions for cough medicines, issued during 1661 visits for children's LRTIs[1] in November and December 2012 and 2013 and the same months in 2014 and 2015. This showed that the guidelines had no immediate impact on cough medicine prescriptions.[1] We then designed a systematic intervention to reduce prescriptions for cough medicines, which is described in more detail below. It significantly reduced cough medicine prescriptions issued in 2017–2020 by Terveystalo, the largest private health care service company in Finland, which receives 260,000 paediatric visits per year.[2]

This study built on those studies,[1,2] by evaluating cough medicine prescriptions with LRTIs issued to children aged 0–15 years by two private outpatient clinics run by Terveystalo from 1 January 2014 to 31 December 2020. These clinics, in Tampere in South-West Finland and Kouvola in South-East Finland, also took part in the previous studies.[1,2] This enabled us to evaluate the impact of the 2014 guidelines[1] and whether the active intervention in 2017–2020[2] provided greater momentum for eradicating cough medicine prescriptions especially for children with LRTIs.

Terveystalo's electronic health record system enabled us to carry out a follow-up study based on real-time data about specific physicians. The 2017–2020 intervention aimed to eradicate cough medicine prescriptions for children, by sending educational material to physicians and caregivers. These were based on the Finnish guidelines, which do not recommend cough medicines for children. General reminders were sent to physicians who had prescribed cough medicines and they were sent personalised letters, followed up by phone calls, if they continued prescribing.

Data on cases were gathered from the electronic health records using the International Classification of Diseases, Tenth Revision codes that included a cough as a symptom (J11*, J18*, J20*, J21* and J22*). Drug prescriptions were identified using the Anatomical Therapeutic Chemical Classification system codes R05F (combined cough suppressants and expectorants), R05C (just cough expectorants) and R05D (just cough suppressants). Drug prescriptions were linked to the prescribing physicians and clinics, to allow targeted interventions.[2]

We estimated the medication costs using the 2021 price for each product in Euros, multiplied by the number of prescriptions per clinic per year, as Finnish pharmacies charge patients the same price for medication.[2] We assumed that every prescribed cough medicine was purchased.

The analyses included all children aged 0–15 years with LRTIs who visited the two private outpatient clinics from 2014 to 2020. SPSS Statistics for Windows, version 26 (IBM Corp), was used for the data analysis.

There were 13,444 visits for paediatric LRTIs to the two clinics during 2014–2020: 24.5% at <2 years of age, 27.6% at 2–4 years, 32.1% at 5–11 years and 15.8% at 12–15 years. We found that 59.8% were treated by general practitioners, 17.9% by paediatricians and 6.4% by ear, nose and throat doctors. The other 15.9% were treated by other specialists.

In 2016, before the active intervention, 68/1169 (5.8%) and 234/1469 (15.9%) of the children received cough medicine prescriptions for LRTIs from the Pirkanmaa and Kymenlaakso clinics, respectively (Figure 1). The annual costs paid by families were €2136 and €5388, respectively.

No cough medicine prescriptions were issued by the Pirkanmaa clinic in 2020. The Kymenlaakso clinic did not issue any prescriptions for children under 2 years, but did issue prescriptions for 4/278 (1.4%) older children. The annual costs decreased to €0 and €89, respectively.

This study of these two private outpatient clinics confirmed the results of the nationwide intervention study.[2] The numbers of

Abbreviation: LRTI, lower respiratory tract infection.

This is an open access article under the terms of the Creative Commons Attribution-NonCommercial-NoDerivs License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.
© 2022 The Authors. *Acta Paediatrica* published by John Wiley & Sons Ltd on behalf of Foundation Acta Paediatrica.

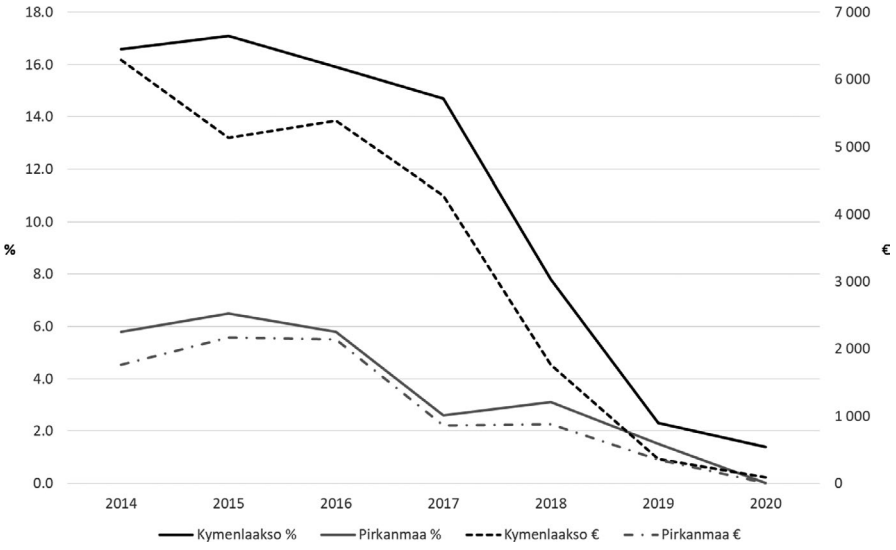

FIGURE 1 Percentage of children aged 0–15 who received cough medicine prescription for LRTIs from 2 private outpatient clinics and the annual costs in Euros

cough medicine prescriptions and the associated costs were reduced by active interventions that combined general information with education targeted at specific physicians and clinics. Our goal to eradicate cough medicine prescriptions for children succeeded, because no children under 2 years and only 1.4% of older children received prescriptions by 2020. In addition, the regional difference in cough medicine prescriptions seen before the intervention disappeared.

Medical guidelines are constantly issued and updated, but not enough attention has been paid to their successful implementation. Coughs are common symptoms of numerous diseases and affect large numbers of children, who are treated by a heterogeneous group of physicians. This study confirmed our previous findings that developing and disseminating guidelines is not enough and that successful implementation relies on flexible and proactive interventions.

This study showed that the effect of treatment guidelines was significantly enhanced, and regional differences were reduced, by an active step-by-step intervention targeted at physicians. This was in line with our previous findings.[2] In addition, an American study showed that providing primary care physicians with personal feedback increased their compliance with guidelines covering antibiotics for children with community-acquired pneumonia.[3]

We conclude that actively disseminating electronic and printed material together with following up cough medicine prescriptions and personalised feedback led to a radically improved guideline adherence. This was a simple and cost-effective process but requires an electronic health record system that allows online monitoring and linking prescriptions to physicians to be reproduced.

CONFLICT OF INTEREST

None.

Sauli Palmu[1]
Paula Heikkilä[1]
Juho E. Kivistö[1,2]
Roope Poutanen[1]
Matti Korppi[1]
Marjo Renko[3]
Péter Csonka[1,4]

[1]*Tampere Center for Child, Adolescent and Maternal Health Research, Faculty of Medicine and Health Technology, Tampere University and Tampere University Hospital, Tampere, Finland*
[2]*Allergy Centre, Tampere University Hospital Tampere, Tampere, Finland*
[3]*Department of Pediatrics, University of Eastern Finland and Kuopio University Hospital, Kuopio, Finland*
[4]*Terveystalo Tampere, Tampere, Finland*

Correspondence
Sauli Palmu, Tampere Center for Child, Adolescent and Maternal Health Research, Faculty of Medicine and Health Technology, Tampere University and Tampere University Hospital, Elämänaukio 2, FI-33521 Tampere, Finland.
Email: sauli.palmu@tuni.fi

ORCID

Sauli Palmu https://orcid.org/0000-0003-3270-7660
Paula Heikkilä https://orcid.org/0000-0002-5989-8615
Juho E. Kivistö https://orcid.org/0000-0003-1313-9178
Roope Poutanen https://orcid.org/0000-0003-2951-3777
Matti Korppi https://orcid.org/0000-0001-8153-1919
Péter Csonka https://orcid.org/0000-0003-0819-7875

REFERENCES

1. Kivistö JE, Poutanen R, Protudjer JLP, et al. Current Care Guidelines had no immediate effects on antitussive prescriptions to Finnish children. Acta Paediatr. 2021;110:2445-2447.
2. Csonka P, Heikkilä P, Koskela S, et al. Cough and cold medicine prescription rates can be significantly reduced by active intervention. Eur J Pediatr. 2021;1–9. doi:10.1007/s00431-021-04344-0
3. Diaz MCG, Handy LK, Crutchfield JH, et al. Impact of a personalized audit and feedback intervention on antibiotic prescribing practices for outpatient pediatric community-acquired pneumonia. Clin Pediatr (Phila). 2020;50:988-994.