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DR. MARIA APARICIO (Orcid ID : 0000-0002-1604-7562)

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Paediatricians provide higher quality care to children and adolescents in primary care: a systematic review

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AUTHORS:

Aparicio Rodrigo, María. MD, PhD. Associate Professor of Paediatrics. Complutense University of Madrid. Primary paediatrician. Madrid Health Service. Madrid. Spain

Ruiz Canela, Juan. MD. Primary care paediatrician. Andalucía Health Service. Sevilla. Spain

Buñuel Álvarez, Jose Cristóbal. MD. Primary care paediatrician. Aragon Health Service. Zaragoza. Spain

García Vera, César. MD. Primary care paediatrician. Aragon Health Service. Zaragoza. Spain

Esparza Olcina, Maria Jesús. MD. Primary care paediatrician. Madrid Health Service. Madrid. Spain

Barroso Espadero, Domingo. MD. Primary care paediatrician. Extremadura Health Service. Cáceres. Spain

González Rodríguez, Paz. MD. Primary care paediatrician. Madrid Health Service. Madrid. Spain

Juanes Toledo, Blanca. MD. Primary care paediatrician. Madrid Health Service. Madrid. Spain

Martínez Rubio, Victoria. MD. Primary care paediatrician. Madrid Health Service. Madrid. Spain

Ortega Páez, Eduardo. MD. Primary care paediatrician. Andalucía Health Service. Granada. Spain

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Correspondence author: María Aparicio Rodrigo, Centro de Salud Entrevías, C/ Pedroches 3, 28053 Madrid, Spain.

Telephone. No +(34) 699752787

Email: marapa04@ucm.es

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ABSTRACT

Paediatricians provide higher quality care to children and adolescents in primary care: a systematic review

Aim: The number of primary care paediatricians is decreasing in Europe without a justifiable reason. We aimed to compare the clinical practice of paediatricians and family doctors attending children and adolescents in primary care

Methods: MEDLINE, EMBASE, CENTRAL, TRIP and Google Scholar were searched from 12/2008 to 2/2018. No language or study design restrictions were applied. Three reviewers assessed eligibility of the studies. Seven pairs of reviewers performed the data extraction and assessed the methodological quality independently. Discrepancies were resolved by consensus.

Results: 54, out of 1150 studies preselected, were included. We found that paediatricians show more appropriate pharmacology prescription patterns for the illness being treated; achieve higher vaccination rates and have better knowledge of vaccines and fewer doubts about vaccine safety; their knowledge and implementation of different screening tests are better; prescribe psychoactive drugs more cautiously and more in line with current practice guidelines; their evaluation and treatment of obesity and lipid disorders follow criteria more consistently with current clinical practice guidelines; perform fewer diagnostic test, show a more suitable use of the test and request fewer referrals to specialists.

Conclusion: according to published data, in developed countries, paediatricians provide higher quality care to children than family doctors.

Key words: ambulatory care, family practice, paediatricians, physicians, family, primary healthcare.

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KEY NOTES

•The number of primary care paediatricians is decreasing in Europe without a clear response from the health authorities

•Paediatricians, irrespective of their place of work or the type of research study in question, are more effective than family doctors at addressing problems related to children in primary care

•A shift from a system of paediatricians to family doctors may lead to a decline in the quality of medical care provided to children

List of abbreviations

Odds ratio (OR)

95% confidence intervals (95% CI)

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INTRODUCTION

For a number of years some European countries have been questioning which medical professional should care for children in primary care (1) . Health authorities often consider children and adolescents to be an essentially healthy part of the population. And they are typically not a priority for health policy.

According to recent data (2), the number of paediatricians in Europe has been falling. This study shows that, in primary care, family doctors are replacing paediatricians. The fall in the number of paediatricians in Europe is not a surprise, having already been identified by Van Esso (3) in 2010 and Katz (4) in 1999.

Children's medical attention has been left in the hands of professionals with an average paediatric training of four months (3), with shorter periods or even no formal training in some countries. It has been justified for political and, or economic reasons although many indicators demonstrate that it results in worse outcomes (5,6).

In 2011 the Primary Care Spanish Paediatric Association, aware of the need to gather data highlighting the work of paediatricians in primary care, asked the Group of Evidence-based Paediatrics to carry out a systematic review comparing the work of paediatricians in primary care with that of other professionals. The findings (7) showed that paediatricians prescribed fewer antibiotics for viral infections; were more likely to adhere to clinical practice guidelines in cases of fever and attention deficit hyperactivity disorder; dealt more effectively with other common childhood illnesses (like asthma or otitis media); and achieved higher vaccination rates. The Primary Care Spanish Paediatric Association considered an update to the 2011 systematic review to be necessary.

MATERIAL AND METHODS

Eligibility criteria

Studies of any type of design were considered if they compared the clinical practice of paediatricians and family doctors, excluding letters to the editor or editorials. The participants were paediatricians and family doctors who attend children in primary care or hospital emergency departments.

Search strategy

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We searched MEDLINE, EMBASE, Cochrane Central Register of Controlled Trials (CENTRAL), TRIP Database and Google Scholar from December 2008 to February 2018. There was no publication language nor any other restriction applied. Table S1 shows the descriptors used. The Spanish equivalents to the search terms were also used to retrieve additional publications in Google Scholar. We reviewed the references to obtain additional relevant articles.

Data extraction and evaluation of methodological quality

Three reviewers (JCB, JRC,MAR) independently assessed eligibility of the studies identified by examining titles and abstracts. For those eligible studies, the full paper was obtained. Disagreements on eligibility were resolved by consensus. The selection process is shown in Figure 1. The selected studies were distributed to seven pairs or reviewers. Each of the reviewers independently extracted the data and assessed the methodological quality with the tool "OSTEBA; Critical Appraisal Cards" (OSTEBA, Basque Office for Health Technology Assessment, Bilbao, Spain).This program evaluates according to three quality levels: low, medium and high, with the evaluation based on six items: clearly defined research question, appropriate methodology, results description, conclusions taking into account the limitations of the study, conflicts of interests and external validity. Any disagreement was resolved by consensus. If this was not possible three of the authors(JCB, JRC,MAR) made the final decision.

Statistical analysis

Whenever possible Odds ratio (OR) for cohort studies and Prevalence ratio in cross sectional studies were calculated, if not provided, with 95% confidence intervals (95% CI).

Results of the studies were combined when possible with a global combined estimator (OR), using the inverse variance method, and applying either a fixed effects model, or a random effects model, depending on the presence or not of statistical heterogeneity (estimated with Cochrane´s Q test; and with I2). Publication bias was evaluated by the Begg method.

RESULTS

We included 54 studies : one before-and-after study, 15 cohort studies and 38 cross-sectional studies.

Antibiotic use in respiratory tract infections

We included eight retrospective cohort studies (Table 1). Heterogeneity did not allow a meta-analysis to be performed. In five articles (8-12) antibiotic prescription was more appropriate by

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paediatricians. In two of them (13,14) there were no differences. In the final study, family doctors made better prescriptions (15).

Otitis media management

We included three studies: one cross-sectional survey (16) and two cohort studies (17,-18) (Table 2). All the studies found that paediatricians´ prescription for acute otitis media adhere better to guidelines than family doctors´ did.

Asthma management

We included three studies: two cross-sectional studies (19,20) and one retrospective cohort study (21) (Table 3). In all but one (21) family doctors got better results.

Management of psychiatric disorders

We selected two studies (Table 4): one cross-sectional study (22) which evaluated the specific skills for the management of psychiatric conditions among primary care professionals in a setting with a lack of specialists in psychiatry. Paediatricians and family doctors performed similarly. The other one (23) was a retrospective cohort study designed to investigate a previously discovered increase of prescription rates of psychotropic drugs in patients younger than 18 years of age. In this case, paediatricians performed more in accordance with guidelines than did family doctors.

Immunizations

We selected 19 papers: 18 cross-sectional studies and one cohorts study (Table 5). Six of the studies considered the human papillomavirus vaccine (24-29) and all were based in the USA. In four, paediatricians did better than family doctors did. In two of them there were no differences. Two cross-sectional studies analysed the attitudes towards the flu vaccine (30,31) in at-risk children. One found better results for paediatricians in children with asthma. The other found no differences. A further paper (32) studied the attitude towards vaccines of paediatricians and family doctors.

Paediatricians recommended all vaccinations more frequently. In two cross-sectional studies (33,34) analysing practices related to rotavirus vaccine in the USA, paediatricians did better than family doctors did. Kempe et al (35) analysed in 2010 the compliance of the regulations on type B Haemophilus Influenzae vaccination in the USA in shortage periods. Paediatricians were more often familiar with the recommendations in these circumstances. Tolaymat et al (36)studied the knowledge of vaccination guidelines for children with inflammatory bowel illness and

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immunosuppressant treatment. Paediatricians more frequently identified vaccines that should not be given to these patients.

The studies on vaccination in Europe relating to MMV, pertussis and pneumococcal vaccines (37); hepatitis B vaccine (38) and meningitis B vaccine (39), favoured paediatricians.

Two studies (40, 41), analysing the influence of the specialty of the physician on vaccination refusal in the USA, found mixed results.

Finally, one study (42) analysing the completion of vaccination charts in 2017 found that paediatricians did better than family doctors.

Cardiovascular risk

The attitude of paediatricians and family doctors towards cardiovascular risk in childhood, was evaluated in five studies (diagnosis and prevention of overweight and obesity [43-45], sudden cardiac death screening in athletes [46], lipid alteration [47]). Four showed results in favour of paediatricians and one found similar results in paediatricians and family doctors (Table 6).

Other preventive activities

The provision of preventive healthcare services, other than vaccination, was assessed in eight studies (48-55). All of them were cross-sectional studies of low quality. In all but one the results favoured paediatricians (Table7).

Diagnostic tests

We found five studies performing comparison in this field (56-60). One was a retrospective cohort study; the other four were cross-sectional studies (Table 8). Paediatricians showed better results than family doctors in all of them.

DISCUSSION

The results of this review show that paediatricians, irrespective of their place of work or the type of research study in question, are more effective than family doctors at addressing problems related to children in primary care. Our findings are consistent with those studies published prior to 2008 and summarized in the previous systematic review (7).

Recent studies on antibiotic treatment have been included in this review. These showed that, except in a few specific cases, paediatricians more frequently prescribe antibiotics in line with clinical practice guidelines and more appropriate for child infectious diseases than family doctors do. Only one study (15) found that family doctors´ prescription of antibiotics was better than that

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of paediatricians. This study was carried out in one paediatrician´s office, who attended 530 children, and compared with seven family doctors´ practices, who were also university professors and who covered 436 children in total. The age ranges treated by each professional were not specified. The authors of the study noted that their findings might not be representative, given the high level of expertise of the university professors. This specific study noted that the paediatricians referred four to five times more children to specialists and hospitals in comparison to the family doctors. Two other studies found no differences in the prescription of antibiotics. Overall, the data are similar to the previous systematic review (7), where the meta-analysis showed a 1 to 1.8 times greater likelihood of primary care non-paediatric doctors, prescribing antibiotics for respiratory tract infections of likely viral aetiology when compared with paediatricians .

These findings are more significant than they might appear. Incorrect use of antibiotics, frequently due to prescriptions for viral infections, exponentially increases the risk of bacterial resistance, iatrogenic harm and cost.

There were only three new studies on the treatment of otitis media. All three showed more appropriate antibiotics prescribing practices by paediatricians. The previous systematic review (7) covered a higher number of publications on this subject (12 in total). Seven of these analysed the adherence to clinical practice guidelines or expert consensus. All of the studies except one found that paediatricians adhered more frequently to clinical practice guidelines. The five other studies compared clinical practices without using a standard for comparison. Except for a case-control study, of medium quality, which found no differences between paediatricians and family doctors when analysing diagnostic certainty for otitis with tympanocentesis, all the other studies found better antibiotics prescribing practices by paediatricians and a higher number of referrals to the otolaryngology specialists by family doctors.

Three studies on asthma were considered. One of them found that family doctors were more sensitive to economic factors. Another one found a higher use of spirometry by family doctors. The third analysed the treatment of childhood asthma and found a higher use of short-term oral corticosteroids treatment (following the current guidelines) by paediatricians, although this practice was not linked to lower levels of hospitalization. There were no data to assess the adequacy of the practice in this particular study, which was an analysis of a medical database. In the previous systematic review (7) aspects that have not been addressed again in this update were analysed: prescription of antibiotics for asthma, which was higher among family doctors, and other drugs prescribed for asthma, which was similar between paediatricians and family

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doctors. Also included a cross-sectional study carried out in the USA which found that family doctors used spirometry more frequently (whereas paediatricians used peak-flow meters more often), in line with our results.

The present review covered two articles on the treatment of psychiatric illness. One of these studies (22) found that paediatricians were more confident managing attention deficit hyperactivity disorder whereas family doctors felt more confident with anxiety and depression. However, the response rates were very low. The authors themselves cast doubt on whether the results were representative while other factors were not controlled, like the use of psychotherapy. The second study (23), analysed the prescribing of antipsychotic drugs and found an increase among older children (12-18 years old) when treated by family doctors and psychiatrists, mainly using second generation antipsychotic drugs and against the recommendations of clinical practice guidelines. The study did not specify the number of children according to age treated by each professional or other details that would have allowed us to carry out a more detailed analysis of this prescribing practice. The previous systematic review (7) covered three cross-sectional studies carried out by the same authors. Two of these analysed the adherence to clinical practice guidelines on hyperactivity disorder of the American Academy of Pediatrics and found better results for paediatricians. In the third study, the authors assessed prescribing of antipsychotics in primary care settings in the USA. They found that family doctors had a higher probability of prescribing selective serotonin re-uptake inhibitors, irrespective of the diagnosis, which coincides with our findings.

The largest number of articles covered by this systematic review relate to vaccination. Six of the articles covered the human papillomavirus vaccination. Most of the studies (four out of six), including the only cohort study, found that paediatricians recommended the human papillomavirus vaccination more often and achived better vaccination coverages. The cohort study found that paediatricians obtained 1.5 times higher rate of vaccinations than family doctors. Only two studies, and with much lower response rates (41%), found no differences between paediatricians and family doctors.

In another study (32) the general attitude towards vaccines was assessed. Paediatricians recommended all vaccines more frequently. The main reason why children were not vaccinated was due to doubts about the safety of vaccines. Two other studies on the rotavirus vaccine found that paediatricians recommended the vaccine more frequently, had a better understanding of it and fewer doubts about its safety.

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Paediatricians typically have a more extensive knowledge of vaccines regulation, as shown in the studies on Haemophilus Influenzae vaccination during a period of vaccine shortage (35), or on the vaccination of children receiving immunosuppressive therapy (36).

Only three of the 19 studies on vaccinations were carried out in Europe (France); the rest were undertaken in the USA. The results, however, were consistent. The French studies found a stricter adherence to immunization schedules by paediatricians, who also recommended vaccines more often, vaccinated more and were more knowledgeable on vaccines.

There were only two studies that analysed the rejection of vaccination. They compared the requests for signed authorization forms – a practice recommended by some guidelines – that were higher among paediatricians, and the exclusion from medical practices of those families which refuse vaccination. This practice is not recommended by paediatric associations and was more common among paediatricians. There was no data on this topic in the previous systematic review (7).

The use of anti-flu vaccinations for high-risk patients was analysed in two studies. One found that paediatricians vaccinated children with intermittent asthma four times more often, and children with severe asthma fourteen times more often than family doctors did. The other study identified no differences between anti-flu vaccination rates of healthy and high-risk children when treated by family doctors or paediatricians .

Another study analysed the use of vaccination records. Family doctors were less aware of vaccination records and used them less.

The findings of this systematic review are aligned with those of the previous one (7), which also covered a high number of studies. Doubts about vaccine safety is of concern as health professionals have the greatest influence on families deciding whether to vaccinate their children (61).

Childhood obesity is currently an important global health issue. The studies covered showed that paediatricians made assessments and recommended treatments of childhood obesity according to clinical practice guidelines. There were no available studies regarding the results of these practices. These findings are in line with those from the previous systematic review (7).

Only one of the studies analysed the attitudes towards lipid disorders. Paediatricians followed clinical practice guidelines more frequently, offering better management and treatment for these disorders, coinciding with the previous systematic review (7).

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Paediatricians handle screening programs in a more appropriate way than family doctors, as shown in the selected studies on the management of tests to assess the psychomotor development and neurodevelopmental disorders (paediatricians use them more, interpret them better, produce reports on them more often and make more referrals to early intervention services). Concerning the “new-born screening metabolic test”, a study (51) in Canada showed how family doctors acknowledge their lack of training, whereas paediatricians are two to three times more likely to know about it, how to interpret its results and how to inform families. Similarly, paediatricians have more knowledge on other preventive activities, such as oral health programs, understanding of popular games among adolescents and are more aware of child protection policies. These results are consistent with those of the earlier systematic review (7), which found that, the younger the child, the more likely paediatricians were to carry out preventive activities than were family doctors.

Paediatricians used the streptococcal test more frequently and prescribed fewer antibiotics for acute pharyngitis. Paediatricians were more often aware of the recommendations for the treatment and management of neonatal hyperbilirubinemia. Paediatricians were also more likely to diagnose suspected celiac disease based on gastrointestinal and general symptoms and were more knowledgeable of the diagnosis criteria for bronchiolitis. Similarly, paediatricians made earlier diagnoses of acute lymphoblastic leukaemia. Again, this coincides with the previous systematic review (7), which also found better use of the streptococcal test and other diagnostic tests and fewer requests for them, in general, from paediatricians.

This systematic review had several limitations. Most of the studies have an observational cross-sectional design and were carried out through self-completion questionnaires, with a very variable (and sometimes low) number of responses. This can lead to patient selection bias. Others were retrospective cohort studies, whose results were collated from large healthcare databases with limited detailed records, insufficient for a more thorough analysis. Both types of studies are rated as low quality of evidence according to the Grading of Recommendations, Assessment, Development and Evaluation system (GRADE) system. The outcomes selected by the studies have a very different degree of interest. A further limitation was the low rate of responses in some of the articles. The individual quality of the studies was evaluated using the critical assessment forms from the Osteba platform; however, there are no internationally recognized tools to evaluate the quality of cross-sectional studies. In addition, for some of the studies, the comparison between the practice of family doctors and paediatricians was not the focus. Nonetheless, the number of studies is high, and the consistency of their results could compensate (partly) for lack of quality. A meta-analysis was not possibly due to the lack of

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homogeneity among the studies. For the same reason it was also not possible to add new studies to the meta-analysis of the previous systematic review.

In summary, this systematic review shows how paediatricians manage the processes related to child health in a more appropriate way than family doctors, and the results of studies published between 2008 and 2018 are similar to those published before 2008. This suggests that, despite the low quality of the studies, the results are not due to chance, but rather the consequence of better training and preparation on the part of paediatricians for the task of managing child health.

As Van Esso (3) described, in Europe there are three models for the care of infants and children's health: only by paediatricians, by a mixture of paediatricians and family doctors and only by family doctors. Despite the results and conclusions published by Katz in 2002 (4) – which showed that the risk of child mortality is lower when paediatricians in primary care are responsible for treating children outside hospital – Van Esso observes how there is a growing tendency for children to be treated by family doctors. Moreover, this is despite the poor outcomes in child health which have been observed in the UK (5,6,62,63), the country which best represents the model of exclusively family doctors in primary care.

In Europe overall, there is not now clear support for the role of paediatricians in the treatment of children in primary care. This fall in support for paediatricians has a number of causes, as Ehrlich set out in a recent publication (2). Twelve of the 40 countries that participated in the study recognized that they are assessing which specialist is best placed to attend to the paediatric population in primary care: family doctors or paediatricians. The reasons given for the change are economic (nine countries out of 12); political (six of 12); professional standing (four of 12); historical (two of 12) and geographical (one of 12). Notably, none of the countries referred to infant health outcomes.

Governments include economics as a reason for change from a system of paediatricians in primary care to family doctors. There is, however, no study supporting this approach. In this systematic review, despite an active search, we have not found any studies which consider the economic outcomes according to the medical professional responsible for paediatric care. The only data available on this issue are those of the study carried out in the Italian region of Molise (64). The findings were such that had paediatricians treated all of the children, the savings would have been of €6.5m in three years. The findings of this study were presented in a conference in Italy but were not published.

Up until now there have been only limited indicators of child health (neonatal mortality rate, the infant mortality rate, the mortality rate for children under five, delayed development,

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malnourishment), and this has made it difficult to quantify other aspects of paediatric care for effective comparisons (as antibiotic prescription, vaccinations or adherence to clinical practice guidelines). Recently the first study of paediatric indicators has been published (65). We hope that these indicators will facilitate these comparisons in the future.

Given the lack of indicators, the quality of paediatric care can be evaluated indirectly by assessing the training of the medical professionals providing it. According to the findings of Ehrlich (2), the duration of the training period for paediatricians in Europe lasts between two and six years with an average of four or five years in the majority of countries. In 50% of the countries, paediatricians have specific training in paediatrics in primary care. On the other hand, the training in paediatrics of family doctors, according to Van Esso (3), lasts for three to six months with an average of four months. In some countries, such as the UK, there is no particular paediatric training for family doctors.

The shift in primary care for infants and children from a system run by paediatricians to one run by family doctors is not based on any research, whether clinical or economic. The logical conclusion that a better-trained specialist offers better care is supported by the published studies highlighted in this review. This indicates that a shift from a system of paediatricians to family doctors may lead to a decline in the quality of medical care provided to children. Children's health is particularly important because it ensures improved health in adulthood (66); this in return reduces healthcare costs and improves the overall quality of life of the population.

CONCLUSION

The main conclusion of our review is that, according to published data, in developed countries paediatricians provide higher quality care to children than do family doctors. That is: paediatricians' pharmacology prescription pattern is more appropriate for the illnesses being treated; paediatricians make less frequent inadequate use of medication (both antibiotics and other medication like psychoactive drugs); they achieve higher vaccination rates and have better knowledge of vaccines and less doubts about vaccine safety; their knowledge and implementation of different screening tests is better; they prescribe psychoactive drugs more cautiously and more in line with clinical practice guidelines; their evaluation and treatment of obesity and lipid disorders follows criteria more consistent with current clinical practice guidelines; they make fewer and more suitable use of diagnostic tests and they make fewer referrals to specialists.

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We would like to call upon healthcare authorities to prioritize child health and to set out a strategy to ensure not only adequate replacement of current paediatricians but also sufficient specialist professionals to provide proper paediatric primary care (67).

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CONFLICT OF INTEREST

The authors have no conflict of interest to declare

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Table 1: Studies comparing clinical practice of PED and FD/GP in the prescription of antibiotics in primary care

Author/year publication/ country	Design/quality	Participants	Comparison	Outcome variable	Results* (OR or PR [95%CI])	Results favour
Stojanovic.[15] 2008 (Croatia)	Retrospective Cohort study. Medical records. Medium quality	Clinical registers of 964 children from 1 to 6 years (530 attended by one PEDs and 434 attended by 6 FDs) during 2004	Factors related to ATB prescription	Logistic regression (OR PED vs FD): 1. More ATB prescription 2 Referral to specialist 3. Referral for treatment 4. Hospital referral 5. Other prescriptions	 1.3 [1.0 - 1.6] 4.1 [1.2 - 13.8] 4.2 [1.2 - 14.9] 5.5 [1.4 - 21.7] 1.8 [1.4 - 2.3]	FD
Clavena[8] 2010 (Italy)	Retrospective Cohort study. Medical records. Medium quality	Clinical registers of 548,922 children from 6 to 13 years	Drugs prescription.	OR PED vs FD 1.-Drugs prescription(adjusted OR) 2.-ATB prescription 3.-ATB type: - penicillin - macrolides -cephalosporins	 0.86 [0.85 - 0.87] 1 [0.99 - 1.01]. 1.54 [1.33 - 1.78] 0.81 [0.69 - 0.94] 0.76 [0.65 - 0.89]	PED or similar
Blommaert[13] 2013 (Belgium)	Retrospective Cohorts study IMA (Inter Mutualist Agency) clinical registers Medium quality	Two cohorts: children 1-5 years and adults 30-60 years	Factors related to amoxicillin prescription instead of amoxiclav	Influence of type of health care provider (OR PED vs FD) multivariate analysis 1. Brussels (minimum and maximum prescription age) 2.- Flemish 3.- Wallonia 4.-Overall prescription children 1year Overall prescription children 2 years Overall prescription children 3 years Overall prescription children 4 years Overall prescription children 5 years	 Min2a: OR 2.38(95%CI1.59 - 3.56) Max1a: OR2.58(95%CI1.71 - 3.87) Min5a: OR 1.08(95%CI0.78 - 1.51) Max3a: OR1.2(95%CI0.91 - 1.59) Better prescription by FD (no data) 0.835 (95%CI:0.68 - 1.02) 0.852 (95%CI:0.68 - 1.05) 0.758 (95%CI:0.62 - 0.93) 0.721 (95%CI:0.58 - 0.90) 0.690 (95%CI:0.54 - 0.88)	PED and FD

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Pulcini[9] 2013 (France)	Retrospective Cohorts study Medical records High quality	4921 FDs and 301 PEDs (31,.965 children)	ATB prescription for children under 16 years of age	Median [interquartile 50] of the prevalence rate of antibiotic treatment -FD vs PED ATB prescription (adjusted econometric model) -Type of ATB (adjusted econometric model	FD 43.3% [27 - 63.5] PED 28% [16.2 - 45.6] (P<0.001) FD 54% more ATB than PED FD 54% more penicillin than PED FD141% more macrolides than PED PED more amoxiclav (18% vs 12%)ß	PEDs
Urkin[14] 2013 (Israel)	Retrospective Cohort study. Medical records. Medium quality	87 PEDs. 11FDs and 27GPs (19,865 children)	Acute pharyngotonsillitis: culture and early ATB prescription in children 0-18years	1.-Perform a throat cultures in the first consultation. Logistic regression (OR) 2 Early ATB prescription(OR)	PED>FD (p<0.001) FD>GP (p<0.001) 0.29 [0.26 - 0.33] PED vs FD: 0.87 [0.77 – 1] PED vs GP:1.42 [1.29 - 1.56]	PED more throat culture GP fewer ATB
Sellam[10] 2015 (France)	Retrospective Cohort study. Medical records. Medium quality	Survey of 27 PEDs from an infectious group and comparison with PEDs and GP records from the French Health System	ATB prescription	- ATB prescription (%) + PEDinfec (54,212 visits) PED (no data on visits) GP (no data on visits) - ATB type for OMA treatment: Amoxicillin (PEDinfec; PED; GP) Amoxiclav (PEDinfec; PED; GP) Cephalosporin (PEDinfec; PED; GP) - Type of ATB prescribed (PEDinfec;	 10.7% 12% 21%* 72.3% vs 44% vs 15% 19.3% vs 33% vs 20% 6.4% vs 22 % vs 59%	PED (7)
Watson[11] 2017 (USA)	Retrospective Cohort study. Medical records. Medium quality	255.291 ATB prescription	Factors related to ATB prescription	-OR standardized ATB prescription rate (PED vs FD) (multivariable logistic regression)	0.49 [0.48 - 0.51]	PED
Fleming[12] 2018. (USA)	Retrospective Cohort study. Medical records. High quality	Children below 19 years	ATB and azithromycin prescription	PR azithromycin adjusted prescription (PED vs FD) 0-2 years 3-9 years 10-19years	 0.56 [0.55 - 0.56] 0.71 [0.71 - 0.71] 0.85 [0.85 - 0.85]	PED

PED: paediatricians; FD: family doctors; GP: general practitioners; PEDinfec: infectiology Paediatricians ATB: antibiotics: Amoxicillin-Ac clavulanic: amoxiclav (ß) following the indications of the French guides (+) OR cannot be calculated due to lack of data (*) <1 favours' FD/GP; >1 favours PEDs (**):p<0,001

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Table 2. Studies comparing the clinical practice of PED and FD/GP in the management of otitis media

Author/year of publication/ country	Design/quality	Participants	Comparison	Outcome variable	Results* (OR or PR [95%CI])	Results favour
Ganga-Zandzou[16] 2009 (France)	Cross-sectional Study Professional phone survey Low quality	Survey of 129 FDs and 46 PEDs (rr: 64.5% FD and 67.6% PED)	Adherence to CPG in management of AOM	Adherence to CPG (PR PEDs vs FD) >2years: observation, ATB type, dosage, length of treatment <2years: ATB type, dosage, length of treatment Prescription ATB recommended in case of allergy: Penicillin Beta-lactams	2.36 [1.45 - 3.82] n.s n.s 1.19 [1.01 - 3.72] 2.93 [1.62 - 5.27] 1.24 [0.75 - 2.03]	PED Little difference
Grossman[17] 2012 (Israel)	Retrospective Cohort study. Medical records. Medium quality	292,896 children diagnosed with AOM and treated with ATB by PED (72.3%). FD/GP (14.1%) and otolaryngologist (12.7%) (2002-2009)	Early ATB treatment of AOM (in the 3 days of the beginning) according to medical specialty	Early ATB treatment (%patients)[+] (variation during study period) otolaryngologist PED FD/GP	 -11% (47% to 36%)** - 4% (46% to 42%)** +7% (43% to 50%)**	PED
Shviro-Rosema[18] 2014 (Israel)	Retrospective Cohort study. Medical records. Medium quality	597 children diagnosed with AOM and treated with ATB by 38 FD, 12 PED and 7 GP (participation rate 86.7%)	Adherence to CPG in management of AOM	1. Amoxicillin (OR) -PED vs PEDres[++] -PED vs FD -PED vs GP 2. Dosage appropriate to weight and CPG -PED+ PEDres[#] vs MF -PED+ PEDres vs MG	 0.57 [0.26-1.24] 0.51 [0.25-1.07] 0.72 [0.27-1.93] 3.13 [1.98 a 4.95] 6.88 [3.66 a 12.93]	Same ATB choice. Better PED and PEDres than GP and FD in dosage

FD: family doctors; PED: paediatricians; GP: general practitioner; PEDres: residents of paediatrics; rr: response rate; ATB: antibiotics; AOM: acute otitis media; CPG Clinical practice guidance: OR Odds ratio

PR: Prevalence Ratio; n.s: no significant differences (*) <1 favours' FD/GP; >1 favours PEDs (**):p<0,001 ([+]) OR cannot be calculated with available data; ([++]) listed in column FD/GP; (#):listed in column PED

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Table 3. Studies comparing the clinical practice of PED and FD/GP in asthma management

Author/year of publication/ country	Design/quality	Participants	Comparison	Outcome variable	Results* (OR or PR[95%CI])	Results favour
Patel[19] 2009 (USA)	Cross-sectional study Professional mail survey Medium quality	Survey of 86 FD and 149 PED (rr: 49%)	Ask about cost of asthma treatment	OR (PED vs FD) Ask about cost of asthma treatment	0.71 [0.57 - 0.86]	FD
Dombkowski[20] 2010 (USA)	Cross-sectional study Professional survey Medium quality	360 surveys of 150 FD and 210 PED (rr: 50%)	Use of spirometry in children with asthma	PR (PED vs FD) Use of spirometry Comfortable in interpreting spirometry results	0.50 [0.41 - 0.61][#] 0.60 [0.48 - 0.75]	FD
Farber[21] 2017 (USA)	Retrospective Cohorts study MEDICAID (Inter Mutualistic Agency) and CHIP (Children Heath Insurance Program) clinical registers Medium quality	327,303 children (1 to 18 years) diagnosed with asthma between 2011-2016	Prescription rates of short courses of oral corticosteroids.	Short courses of oral corticosteroid prescription (one or more)[+] PED vs FD/GP/IM Asthma emergency department visits/ hospitalization rates as a function of the corticoid courses	42.1-44.2% 41-42% vs 46-47%** n.s	PED

FD: family doctors; PED: paediatricians; GP: general practitioner: IM: internal medicine physician rr: response rate; PR: prevalence ratio; n.s: non-significant differences (*) <1 favour FD/GP; >1 favour PED (**):p<0,01

(#)Adjusted OR in a logistic regression model with PEDs as reference: 7.6 [3.7–15.4] (+) OR cannot be calculated with available data

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Table 4: Studies comparing the clinical practice of PED and FD/GP for psychopathological disorders in primary care

Author/year of publication/ country	Design/quality	Participants	Comparison	Outcome variable	Results* (OR or PR[95%CI])	Results favour
Fremont[22] 2008 (USA)	Cross-sectional study Professional mail survey Low quality	240 PED/ 243 FD (rr: 38%)	Diagnosis and treatment of psychiatric disorders in children	PR (PED vs FD) ADHD - Comfortable in diagnosing - Comfortable in prescribing medication ANXIETY AND DEPRESSION: - Comfortable in diagnosing - Comfortable in prescribing medication: Antidepressant medications Anxiolytic medications	 1.92[1.20 - 3.07]#[1] 2.20[1.39 - 3.45]#[2] 0.54[0.41 - 0.71]#[3] 0.63[0.44 - 0.89]#[4] 1.07[0.72 - 1.58]#[4]	Similar PEDs better for ADHD medication; FD better for anxiety and depression medication
Ronsley[23] 2013 (Canadá)	Retrospective Cohorts study Clinical registers (1996-2011) Medium quality	PED. FD y psychiatrists	Prescription of antipsychotics in children under 18 years	Antipsychotic prescription rate change+ Second generation antipsychotic change+ Prescription change for age and sex: -1º males 13-18 years -2º females 13-18 years -3º males 6-12 years Prescription in 2010/11 (in 1996-97) according to specialist+ -Children 0-5years (PED/GP/Psychiatrist) -Children 5-11years (PED/GP/Psychiatrist) -Children 13-18years (PED/GP/Psychiatrist)	Increase 3.8 fold Increase 18.1 fold Increase 4.4 fold Increase 3.8 fold Increase 3.7 fold 46.8%/22.4%/14.1% 14.9%/27.8%/29.1% 9.5%/38.8%/39.1%	PED

FD: family doctors; PED: paediatricians; GP: general practitioner; rr: response rate; ADHD: Attention deficit/hyperactivity disorder; (*) <1 favour FD/GP; >1 favour PED (**):p<0,01

#Study authors calculated Adjusted OR: #[1]3.05[1.40-6.63]; #[2]4.16[1.96-8.84];#[3]0.28[0.14-0.57]; #[4](antidepressants and anxiolytics as a whole)0.44[0.22-0.87] (+) OR cannot be calculated with available data

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Table 5. Studies comparing the clinical practice of PED and FD/GP on immunization in children in primary care

Author/year publication/ country	Design/quality	Participants	Comparison	Outcome variable	Results* (OR or PR [95%CI])	Results favour
Dombkowski[30] 2008 (USA)	Cross-sectional study. Professional survey. Low quality	175 PED and 145 FD (rr: 67%)	Flu vaccination in children with asthma	Adjusted OR (PED vs FD) Flu vaccination of children with persistent asthma Vaccination of children with intermittent asthma	 14.4 (no data CI)*** 3.62 [1.72 - 7.60]	PED
Gust[32] 2008 (USA)	Cross-sectional study Professional online survey Medium quality	250 PED and 484 FD (rr:65%)	Attitude towards vaccine recommendations	PR (PED vs FD) Recommend all immunizations Adjusted OR multivariate analysis: variables associated with no recommend immunization (PED vs FP)	 2.46 [1.45 - 4.19] 0.34 [0.17 -0.71]	PED
Kempe[33] 2009 (USA)	Cross-sectional study Professional online survey High quality	360 PED and 263 FD	Rotavirus Vaccination at PED and FD clinics	PR (PED vs FD) Routinely offering the vaccine Do not offer RV RV offered but not routinely Knowledge of 1st dose dosage Knowledge of 3rd dose dosage RV security doubts Doubts about over-vaccination Economic barriers	 2.65 [2.10 - 3.57] 0.39 [0.30 - 0.51] 0.38 [0.22 - 0.64] 2.01 [1.72 - 2.36] 1.67 [1.45 - 1.93] 0.51 [0.37 - 0.69] 0.41 [0.27 - 0.60] 0.92 [0.77 - 1.10]	PED
Kempe[35] 2010 (USA)	Cross-sectional study Professional online survey High quality	219 PED and 135 FD (rr: 68% y 51%)	Hib vaccination during a period of vaccine shortage	PR (PED vs FD) Know ACIP recommendations during supply failure Hib Do not vaccinate low-risk children Vaccinate high-risk children	 4.98 [1.99 - 12.43] 1.27 [1.02 - 1.57] 0.79 [0.55 - 1.13]	PED
Daley[24] 2010 (USA)	Cross-sectional study Professional survey High quality	349 PED and 331 FD (rr: 81% and 79%)	HPV vaccination by PED and FD	PR (PED vs FD) HPV recommendation -Of recommended:female11-12y	 3.63[1.82-7.12] 1.14[0.98-1.32]	PED

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				-Of recommended: female 13-15y	1.22[0.93-1.57]	
Kempe[40] 2011 (USA)	Cross-sectional study Professional survey. High quality	357 PED and 262 FD (rr: 88% and 78%)	Prevalence of doubts regarding vaccination in families	PR (PED vs FD) Require parents to sign if they refuse vaccinations Reject anti-vaccine families	 1.45 [1.27 - 1.66] 1.79 [1.61 - 1.98]	NOT CLEAR
Vadaparampil[25] 2011 (USA)	Cross-sectional study Professional survey Medium quality	287 PED and 500 FD (rr:68%)	HPV recommendation at 11-12y and 13-17y	PR (PED vs FD) High knowledge about HPV Perceiving barriers to vaccination OR logistic regression model (PED vs FD) Always recommends HPV at age 11-12 Always recommends HPV at age 13-17	 0.73 [0.61 - 0.88] 0.64 [0.52 - 0.79] 2.6 [1.9 – 3.7] 4.7 [3.4 – 6.6]	PED
Toback[31] 2012 (USA)	Cross-sectional study Professional survey Medium quality	105 PED offices and 13 FD offices	Attitude in regard to flu vaccine	PR (PED offices vs FD offices) Recommend vaccine to all child 6month-5y Recommend vaccine to no high risk child 5-18y Recommend vaccine to high-risk child 5-18y	 1 [1-1] 1.19 [0.93 - 1.5] 1.35 [0.76 - 2.39]	SAME
Pruvost[37] 2012 France	Cross-sectional study Professional survey Medium quality	43 PED and 109 FD (rr: 61%)	Adherence to the vaccine schedule for MMR, pertussis, and pneumococcus	PR (PED vs FD) Adherence to pneumococcal vaccination schedule Adherence to pertussis vaccination schedule Adherence to MMR vaccination schedule	 12.10 [1.73 - 84.73] 1.49 [0.89-2.46] 2.14 [1.32-3.47]	PED
O´Leary[34] 2013 (USA)	Cross-sectional study Professional survey Medium quality	285 PED and 192 FD (rr:70% and 61%)	Rotavirus vaccine practices	PR (PED vs FD) Recommend the vaccine Inform but not recommend Administer the vaccine Doubts about security	 3.93 [2.28–6.76] 0.24 [0.13-0.43] 3.96 [2.44-6.40] 0.28 [0.17-0.45]	PED
Tolaymat[36] 2013 (USA) (oral communication)	Cross-sectional study Professional survey Low quality	26 PED, 34 FD and 18 residents	Knowledge of vaccination in children with inflammatory bowel disease and immunosuppressive therapy	PR (PED vs FD) Identify attenuated vaccines as unsafe	 2.25 [1.16 - 4.36]	PED

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O´leary[41] 2015 (USA)	Cross-sectional study Professional survey High quality	282 PED and 252 FD. (rr: 66% y 61%)	Prevalence of vaccine rejection and attitude towards it	Parents' request not to meet immunization schedule (all): 1-4 /month rejection At least 1request/month vaccine delay PR (PED vs FD) Require parents to sign if they refuse vaccinations Reject anti-vaccine families Asking about attitudes to vaccines in prenatal visit	63% (PED 68%; MF 57%) 83% (PED 88%; MF 76%) PR 1.96 [1.65 - 2.33] PR 1.78 [1.56 - 2.04] PR 1.58 [1.34 - 1.85]	MIXED
Kulczcki[26] 2016 (USA)	Cross-sectional study Professional survey Medium quality	151 PED and 148 FD (rr:43%)	Prescription of HPV vaccine in primary care	PR (PED vs FD) HPV Prescription Multivariate logistic regression. OR(PED vs FD)	 1.06 [0.83 - 1.34] 0.57 [0.30-1.09]	SAME
Allison[27] 2016 (USA)	Cross-sectional study Professional survey High quality	364 PED and 218 FD (rr: 82% and 56%)	HPV vaccine recommendations at 11-12 y and delay frequency	PR (PED vs FD) Vaccine recommendation Talk about the vaccine. 11th visit.	 1.01 [0.89 - 1.15] 1.27 [1.05 - 1.54]	SAME/PED
Levy[39] 2016 (France)	Cross-sectional study Professional survey Low quality	939 PED and 502 FD (rr: 12%)	Doctors perceptions after meningitis B vaccine commercialization	PR (PED vs FD) Knowing the existence of the vaccine Know the vaccine schedule Have started vaccination	 2.34 [2.01 - 2.71] 1.67 [1.56 - 1.78] 1.41 [1.30 - 1.53]	PED
Vie le sagne[38] 2016 (France)	Cross-sectional study Professional phone survey Medium quality	463 PED (232 T1, 231 T2) and 418 FD (192 T1, 296 T2)	Acceptability of hepatitis B vaccine after reimbursement	PR (PED vs GP) Vaccination at the beginning Vaccination at 3 years (final) Hepatitis B vaccine recommendation at the beginning Hepatitis B vaccine recommendation at 3 years	 1.08 [0.95 - 1.22] 2.64 [1.83 - 3.81] 2.96 [2.11 - 4.14] 2.73 [1.70 – 4.36]	PED
Wilburg[29] 2016 (Poster) (USA)	Retrospective Cohorts study Medical records. Medium quality	Medical records (2006-2013)	HPV vaccination and relationship with type of professional	OR (PED vs FD) Initiate vaccination Complete vaccination	 1.41 [no data] 1.53 [no data]	PED
Kempe[42]2017 (USA)	Cross-sectional study Professional survey. High quality	325 PED. 310 FD (rr: 75% and 68%)	Knowledge of official vaccination registration	PR (PED vs FD) They do not know of the existence of a register	 0.51 [0.33 - 0.77]	PED

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			systems	Use the register	1.30 [1.06 - 1.60]	
Finney Rutten[28] 2017 (USA)	Cross-sectional study Professional survey Media quality	43 PED and 177 FD	HPV vaccine recommendation and its relationship to vaccination rates	PR (PED vs FD) HPV strongly recommended to girls HPV strongly recommended to boys HPV always/usually recommended to girls HPV always/usually recommended to boys	 5.84 [1.87-18.21] 5.46 [2.23 - 13.34] 11.10 [1.57 - 78.54] 7.92 [2.53 - 24.80]	PED

FD: family doctors; PED: paediatricians; GP: general practitioners; rr: response rate; PR: prevalence ratio¸ T1: first period; T2: second period ¸RV: rotavirus vaccines; Hib: Haemophilus influenzae type b HPV: human papillomavirus vaccine; MMR: measles, mumps, rubella y: years; ACIP: Advisory Committee on Immunization Practices (*) <1 favours FD/GP; >1 favours PEDs (**):p<0,001; (***):p<0.01 ($^{+}$) OR cannot be calculated with available data

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Table 6. Studies comparing the clinical practice of PED and FD/GP in the provision of diagnostic, therapeutic and educational activities in relation to cardiovascular risk in paediatric primary care

Author/year publication/ country	Design/quality	Participants	Comparison	Outcome variable	Results* (OR or PR[95%CI])	Results favour
HE[43].2010 (Canada)	Cross-sectional study Professional mail survey Low quality	396 PED and 464 FD (rr: 46% and 48%)	Diagnosis and treatment of paediatric obesity/overweight	PR (PED vs FD) Consider should be treated even if there is no associated morbidity. Use the recommended method/tool for classifying overweight/obesity Use recommended criteria for diagnosis obesity	 1.39 [1.05-1.83] 1.93 [1.66-2.24] 1.52 [1.38-1.67]	PED
Hunag[44] 2011 (USA)	Cross-sectional study Professional survey Low quality	440 PED and 371 FD (rr: 73.7% and 66.9%)	Diagnosis and treatment of paediatric obesity/overweight	OR (PED vs FD) (logistic regression) Provide general advice Advice on specific diet topics Recommend physical activity Referral to specialist Systematic follow-up PR (PED vs FD) Calculate BMI on a regular basis Use of BMI charts	 1.75 [1.35-2.27] 2.32 [1.78-3.03] 1.61 [1.25-2.12] 1.56 [1.03-2.32] 1.49 [1.10-2.00] 1.61 [1.37-1.89] 1.77 [1.53-2.43]	PED
Harkins[45] 2012 (USA)	Cross-sectional study Professional mail survey Low quality	119 PED and 61FD (rr: 54%)	Knowledge and application of CPG on obesity	PR (PED vs FD) Knowledge of obesity CPG Adherence to the CPG by those who knew them Adequate diagnostics with BMI charts Recommendation for physical activity of 1 or more hours/day Recommendation to limit screen time to less than 2 hours/day Adherence to food recommendations	 1.51 [1.10 - 2.08] n.s. 1.71 [1.27-2.28] 0.81 [0.65-1.006] 1.49 [1.20-1.85] 1.28 [1.04-1.56]	PED
Madsen[46]	Cross-sectional study	559 PED. 554 FD and 317	Knowledge and compliance with	PR (PED vs FD)		similar

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2013 (USA)	Professional online survey Medium quality	athletic directors (rr: 72%. 56% y 78%)	national guidelines for sudden cardiac death screening.	Follow-up of the guidelines(all items)	1.15 [0.89-1.48]	
Dixon[47] 2014 (USA)	Cross-sectional study Professional online survey Medium quality	230 PED. 265 FD/GP and 39 advanced practitioners (AP) (rr= 37% , 37%/11% and 5.5%)	knowledge, screening, and management attitudes regarding paediatric lipid guidelines.	PR (PED vs FD): Familiarized with lipid values Comfortable with handling children with lipid disorders Promote healthy lifestyles Recommend low-fat diet Should use lipid-lowering medications	 2.72 [2.25-3.27] 1.38 [1.13-1.67] 1.80 [1.41-2.28] 1.46 [1.21 -1.74] 2.43 [2.03-2.89]	PED

FD: family doctor; PED: paediatricians; GP: general practitioner; rr: response rate; CPG Clinical practice guidelines n.s: not significant (*) <1 favour FD/GP; >1 favours PEDs ; ; n.s: no significant differences

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Table 7. Studies comparing the clinical practice of PED and FD/GP in the provision of preventive activities in paediatric primary care.

Author/year publication/ country	Design/quality	Participants	Comparison	Outcome variable	Results* (OR or PR [95%CI])	Results favour
McClave[48] 2010 (USA)	Cross-sectional study Professional survey Low quality	84 primary care PED, 31 PEDsubspec and 48 GP (rr: 19,61%)	Awareness of the choking game and its warning signs	PR awareness of its warning signs, PED vs GP PED vs PEDsubspec PEDsubspec vs GP	 1.48 [1.03 - 2.12] 1.41 [1.02 - 1.95] 0.92 [0.53 - 1.59]	PED
Herndon[49] 2010 (USA)	Cross-sectional study Professional survey Low quality	264 PED and 157 FD (rr: 31%)	Oral health knowledge confidence and practice patterns.	Multivariate analysis. Just differences: 1-Fluoride-related knowledge 2-Greater confidence in parents' advice	 Best PED**** Best PED****	PED
Burney[50] 2011 (USA)	Cross-sectional study Professional on line survey (pre- and post-training survey). Low quality	57 PED (rr: 58%) and 24 FD (rr: 62%)	Practice in relation to screening for anaemia or sickle cell trait	PR (PED vs FD) Routinely review screening tests for sickle cell disease in new born infants:	 0.73 [0.54 - 0.98]	FD
Hayeems[51] 2013 (Canada)	Cross-sectional study Professional survey Low quality	273 PED, 296 FD y 250 midwives (rr: 51%, 63% and 77%)	Information to families who receive positive screening results for their new-borns.	PR (PED vs FD) 1- Agreed that it was them responsibility to provide care to families 2- In favour of having specific and detailed informative talk versus general information or brochure 3.- Hold a specific and detailed informative talk in practice 4.- Recognize lack of training on the subject 5- Be updated on the Ontario Screening Program 6- Confidence in knowing how to explain screening results to parents	 1.53 [1.15- 2.08] 2.63 [2.10-3.27] 2.23 [1.85-2.68] 0.42 [0.33-0.52] 2.38 [1.95-2.90] 2.77 [2.25 - 3.40]	PED
Vyas[52] 2013 (USA)	Cross-sectional study Professional survey Low quality	88 PED and 49 FD (rr: 64,2 % and 35,8%)	Knowledge and use of WHO growth charts	PR (PED vs FD) Knowledge of existence of WHO charts and recommendations Use of WHO charts	 1.42 [1.03 - 1.96] 0.96 [0.73 - 1.27]	PED
Knudson[53]	Cross-sectional study	148 PED and 178	Adherence to AHA Guidelines for the	PR (PED vs FD)		PED

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2016 (USA)	Professional online survey Low quality	GP (rr: 29% and 13%)	management of neurodevelopmental disorders in Children with CHD	know the AHA recommendations Rarely referred for developmental eval Other items studied	1,54 [1.28 – 1.85] 0.68 [0.47-0.96] n.s	
Ayou[54] 2017 (France)	Cross-sectional study Professional mail survey Low quality	134 PED (rr: 48%) and 298 FD (previous survey)	Knowledge and practice about child abuse and neglect	PED vs GP[+] General Average Scoremax160) Score on clinical practice(max 120) Score on knowledge(max 60)	 87.98 vs 77.88** 52.84 vs 47.65*** 29.5 vs 24.2**	PED
Moore[55] 2017 (USA)	Cross-sectional study Professional survey Low quality	34 PED and 16 FD (rr: 38.5%)	Knowledge and practice of psychomotor development screening	PR (PED vs FD) Perform PDS always Interpreting the screening tests Review results with parents Informing parents and writing of PDS Referral to Early Care	 1.82 [1.01 - 3.25] 2.60 [0.8 - 8.51] 3.51 [1.02 - 12.05] 1.99 [1.10 - 3.60] 5.35 [0.87 - 33.22]	PED

AHA: American Heart Association; CHD congenital heart disease; FD: family doctors; PED: paediatricians; GP: general practitioner; rr: response rate; PR: prevalence ratio¸ PEDsubspec: paediatric subspecialists PDS: psychomotor development screening; WHO: World Health Organization; (*) <1 favours' FD/GP; >1 favours PEDs¸ (**):p<0,001 ; (***);p<0.01; n.s: (****) p<0.05; no significant differences; (+) OR cannot be calculated with available data

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Table 8: Studies comparing the clinical practice of PED and FD/GP in the request for diagnostic tests in paediatric primary care.

Author/year publication/ country	Design/quality	Participants	Comparison	Outcome variable	Results* (OR or PR [95%CI])	Results favour
Park[56] 2013 (France)	Cross-sectional study Professional survey Low quality	46 PED and 36 FD (rr:74% vs 18%)	Use rapid strep test and prescription of ATB	PR (PED vs FD) Use rapid strep test in >3 years Prescribe ATB with strep rapid test -	 1.33 [0.87 - 2.02] 0.54 [0.39 - 0.74]	PED
Mateo[57] 2013 (Canada)	Cross-sectional study Professional survey Medium quality	152 PED and 81FD/GP (rr: 17%)	Compliance with national guidelines for screening, post discharge follow-up, and management of new-borns with hyperbilirubinemia.	PR (PED vs FD) Follow recommendations Control before 72 hours of the hospital discharge of the new born baby Correct response to a jaundice case scenario	 1.76 [1.36 - 2.26] 2.23 [1.49 - 2.31] 5.37 [0.85 - 33.66]	PED
Pham[58] 2014 (France)	Cross-sectional study Professional survey Medium quality	256 GP, 221 gastroenterologist and 227 PED	Adherence to diagnostic guidelines of CD	PR (PED vs GP) suspected CD from GI symptoms< 2y suspected CD from GI symptoms 2-18y suspected EC by weight/size < 2 y suspected EC by weight/size 2-18 y suspected CD from general symptoms <2y suspected CD from general symptoms 2-18y use of antitransglutaminase antibodies for dx use of anti-endomysium antibodies for dx	 1.40 [1.08 - 1.80] 1.42 [1.12 - 1.81] 2.53 [1.77 - 3.59] 1.95 [1.56 - 2.43] 1.53 [1.27 - 1.83] 1.50 [1.25 - 1.80] 4.54 [2.46 - 8.34] 0.61 [0.50 - 0.73]	PED
Lee[59] .2014 (USA)	Cross-sectional study Professional mail survey Medium quality	352 PED and 25 2FD (rr: 43%)	Screening for type 2 DM in adolescents and adherence to ADA recommendations	PR (PED vs FD) HbAC1 screening of patients at risk of DM T2 At least one fasting test (plasma glucose or glucose tolerance) know the ADA guides Include HbA1C in initial screening	 1.53 [1.06 - 2.21] 1.26 [1.09 - 1.47] 0.64 [0.54 - 0.75] 1.28 [1.11 - 1.48]	PED
Gupt[60] 2015 (Canada)	Retrospective population-based cohort study Medium quality	1541 children with acute lymphoblastic leukaemia	Factors related to delayed diagnosis	Logistic regression. Adjusted OR Having PED as primary care physician versus having a GP	 0.62 [0.40 - 0.96]	PED

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		diagnosed 1995-2011				

AAT: anti-tissue transglutaminase antibodies; AAE: anti-endomysium antibodies; ADA: association for the diagnosis of diabetes FD: family doctors; PED: paediatricians; GP: general practitioner; rr: response rate; PR: prevalence ratio¸ ATB: antibiotics; CD: celiac disease GI: gastrointestinal ¸y: years; dx: diagnosis DM diabetes mellitus, (*) <1 favours FD/GP; >1 favours PEDs

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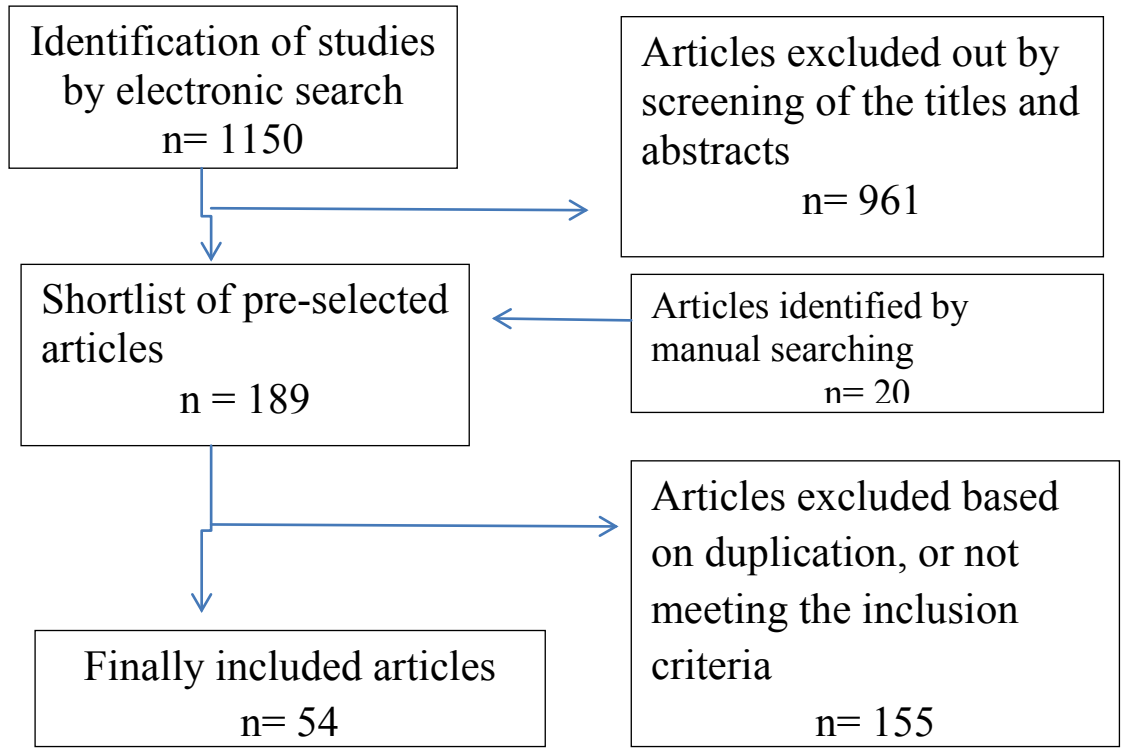
Fig 1. Summary of the study selection process



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