

Supplementary Online Content

Ferreira-Maia AP, Matijasevich A, Wang YP. Epidemiology of Functional Gastrointestinal Disorders in Infants and Toddlers: a systematic review. *World Journal of Gastroenterology*.

Appendix. Search Strategies

Table S1. Critical appraisal of eligible studies of the prevalence/frequency of functional gastrointestinal disorders (FGID) in infants and toddlers

This supplementary material has been provided by the authors to give readers additional information about their work.

Appendix. Search Strategies

Epidemiology of Functional Gastrointestinal Disorders in Infants and Toddlers: a Systematic Review.

Search Methodology

SEARCH #1

Search #1A

DATABASE SEARCHED & TIME PERIOD COVERED:

PubMed –unlimited initial date - 02/22/2016

Language: all

Search strategy:

((((((((((("functional gastrointestinal disorders"[tiab] OR "functional gastrointestinal symptoms" AND ("epidemiology" OR "prevalence" OR "incidence")) AND ((infant[MeSH:noexp] OR infant[MeSH] OR infant, newborn[MeSH] OR child, preschool[MeSH])))) AND ROME criteria) AND ((infant[MeSH:noexp] OR infant[MeSH] OR infant, newborn[MeSH] OR child, preschool[MeSH])))) NOT editorial) NOT clinical trial) NOT case reports) NOT review) NOT letter) AND ((infant[MeSH:noexp] OR infant[MeSH] OR infant, newborn[MeSH] OR child, preschool[MeSH])))

TOTAL: 21

Search #1B:

DATABASE SEARCHED & TIME PERIOD COVERED:

EMBASE –unlimited initial date - 02/22/2016

Language: all

Search strategy:

'functional gastrointestinal disorders' or 'functional gastrointestinal symptoms' and ('epidemiology' or 'prevalence' or 'incidence') and ([newborn]/lim or [infant]/lim or [preschool]/lim) and ([article]/lim or [article in press]/lim or [review]/lim) and [humans]/lim and 'rome criteria'

TOTAL: 7

Search #1C:

DATABASE SEARCHED & TIME PERIOD COVERED:

SCOPUS -unlimited initial date - 02/22/2016

Language: all

Search strategy:

(TITLE-ABS-KEY("functional gastrointestinal disorders" OR "functional gastrointestinal symptoms")) AND (ALL("EPIDEMIOLOGY" OR "PREVALENCE" OR "INCIDENCE")) AND (ALL("ROME CRITERIA")) AND (TITLE-ABS-KEY("NEWBORN" OR "PRESCHOOL" OR "INFANT" OR "TODDLERS")) AND (LIMIT-TO(DOCTYPE,"ar")) AND (LIMIT-TO(SUBJAREA,"MEDI"))

TOTAL: 13

SEARCH #2

Search #2A:

DATABASE SEARCHED & TIME PERIOD COVERED:

PubMed -unlimited initial date - 02/22/2016

Language: all

Search strategy:

((((((((((("infant regurgitation"[tiab] OR "functional gastroesophageal reflux" AND ("epidemiology" OR "prevalence" OR "incidence")) AND ((infant[MeSH:noexp] OR infant[MeSH] OR infant, newborn[MeSH] OR child, preschool[MeSH])))) AND ROME criteria) AND ((infant[MeSH:noexp] OR infant[MeSH] OR infant, newborn[MeSH] OR child, preschool[MeSH])))) NOT editorial) NOT clinical trial) NOT case reports) NOT review) NOT letter) AND ((infant[MeSH:noexp] OR infant[MeSH] OR infant, newborn[MeSH] OR child, preschool[MeSH])))

TOTAL: 3

Search #2B:

DATABASE SEARCHED & TIME PERIOD COVERED:

EMBASE-unlimited initial date - 02/22/2016

Language: all

Search strategy:

'infant regurgitation' or 'gastroesophageal reflux'/exp or 'gastroesophageal reflux' and ('epidemiology'/exp or 'epidemiology' or 'prevalence'/exp or 'prevalence' or 'incidence'/exp or 'incidence') and ([newborn]/lim or [infant]/lim or [preschool]/lim) and ([article]/lim or [article in press]/lim or [review]/lim) and [humans]/lim and 'rome criteria'

TOTAL: 2

Search #2C:

DATABASE SEARCHED & TIME PERIOD COVERED:

SCOPUS-unlimited initial date - 02/22/2016

Language: all

Search strategy:

(TITLE-ABS-KEY("INFANT REGURGITATION" OR "GASTROESOPHAGEAL REFLUX")) AND (ALL("EPIDEMIOLOGY" OR "PREVALENCE" OR "INCIDENCE")) AND (ALL("ROME CRITERIA")) AND (TITLE-ABS-KEY("NEWBORN" OR "PRESCHOOL" OR "INFANT" OR "TODDLERS")) AND (LIMIT-TO(DOCTYPE,"ar")) AND (LIMIT-TO(SUBJAREA,"MEDI"))

TOTAL: 2

SEARCH #3

Search #3A:

DATABASE SEARCHED & TIME PERIOD COVERED:

PubMed-unlimited initial date - 02/22/2016

Language: all

Search strategy:

((((((((((("infant rumination syndrome"[tiab] AND ("epidemiology" OR "prevalence" OR "incidence")) AND ((infant[MeSH:noexp] OR infant[MeSH] OR infant, newborn[MeSH] OR child, preschool[MeSH])))) AND ROME criteria) AND ((infant[MeSH:noexp] OR infant[MeSH] OR infant, newborn[MeSH] OR child, preschool[MeSH])))) NOT editorial) NOT clinical trial) NOT case reports) NOT review) NOT letter) AND ((infant[MeSH:noexp] OR infant[MeSH] OR infant, newborn[MeSH] OR child, preschool[MeSH])))

TOTAL: 0

Search #3B:

DATABASE SEARCHED & TIME PERIOD COVERED:

EMBASE-unlimited initial date - 02/22/2016

Language: all

Search strategy:

'infant rumination syndrome' AND ('epidemiology'/exp OR 'epidemiology'
OR 'prevalence'/exp OR 'prevalence' OR 'incidence'/exp OR 'incidence')
AND ([newborn]/lim OR [infant]/lim OR [preschool]/lim) AND
([article]/lim OR [article in press]/lim OR [review]/lim) AND [humans]/lim
AND 'rome criteria'

TOTAL: 0

Search #3C:

DATABASE SEARCHED & TIME PERIOD COVERED:

SCOPUS-unlimited initial date - 02/22/2016

Language: all

Search strategy:

(TITLE-ABS-KEY("INFANT RUMINATION SYNDROME")) AND
(ALL("EPIDEMIOLOGY"OR "PREVALENCE"OR "INCIDENCE")) AND
(ALL("ROME CRITERIA")) AND (TITLE-ABS-KEY("NEWBORN" OR
"PRESCHOOL" OR "INFANT" OR "TODDLERS")) AND (LIMIT-
TO(DOCTYPE,"ar")) AND (LIMIT-TO(SUBJAREA,"MEDI"))

TOTAL: 0

SEARCH #4

Search #4A:

DATABASE SEARCHED & TIME PERIOD COVERED:

PubMed-unlimited initial date - 02/22/2016

Language: all

Search strategy:

((((((((((("cyclic vomiting syndrome"[tiab] OR "periodic vomiting"AND
 ("epidemiology" OR "prevalence" OR "incidence")) AND
 ((infant[MeSH:noexp] OR infant[MeSH] OR infant, newborn[MeSH] OR
 child, preschool[MeSH])))) AND ROME criteria) AND
 ((infant[MeSH:noexp] OR infant[MeSH] OR infant, newborn[MeSH] OR
 child, preschool[MeSH])))) NOT editorial) NOT clinical trial) NOT case
 reports) NOT review) NOT letter) AND ((infant[MeSH:noexp] OR
 infant[MeSH] OR infant, newborn[MeSH] OR child, preschool[MeSH])))

TOTAL: 4

Search #4B:

DATABASE SEARCHED & TIME PERIOD COVERED:

EMBASE-unlimited initial date - 02/22/2016

Language: all

Search strategy:

'cyclic vomiting syndrome' or 'periodic vomiting' and ('epidemiology'/exp or
 'epidemiology' or 'prevalence'/exp or 'prevalence' or 'incidence'/exp or
 'incidence') and ([newborn]/lim or [infant]/lim or [preschool]/lim) and
 ([article]/lim or [article in press]/lim or [review]/lim) and [humans]/lim and
 'rome criteria'

TOTAL: 1

Search #4C:

DATABASE SEARCHED & TIME PERIOD COVERED:

SCOPUS-unlimited initial date - 02/22/2016

Language: all

Search strategy:

(TITLE-ABS-KEY("CYCLIC VOMITING SYNDROME" OR "PERIODIC
 VOMITING")) AND (ALL("EPIDEMIOLOGY"OR "PREVALENCE"OR
 "INCIDENCE")) AND (ALL("ROME CRITERIA")) AND (TITLE-ABS-
 KEY("NEWBORN" OR "PRESCHOOL" OR "INFANT" OR "TODDLERS"))
 AND (LIMIT-TO(DOCTYPE,"ar")) AND (LIMIT-TO(SUBJAREA,"MEDI"))

TOTAL: 2

SEARCH #5

Search #5A:

DATABASE SEARCHED & TIME PERIOD COVERED:

PubMed–unlimited initial date - 02/22/2016

Language: all

Search strategy:

```
((((((((((("ABDOMINAL PAIN SYNDROME"[tiab] OR "INFANT COLIC"
AND ("epidemiology" OR "prevalence" OR "incidence")) AND
( ( infant[MeSH:noexp] OR infant[MeSH] OR infant, newborn[MeSH] OR
child, preschool[MeSH] ) ))) AND ROME criteria) AND
( ( infant[MeSH:noexp] OR infant[MeSH] OR infant, newborn[MeSH] OR
child, preschool[MeSH] ) ))) NOT editorial) NOT clinical trial) NOT case
reports) NOT review) NOT letter) AND ( ( infant[MeSH:noexp] OR
infant[MeSH] OR infant, newborn[MeSH] OR child, preschool[MeSH] ) ))
```

TOTAL: 6

Search #5B:

DATABASE SEARCHED & TIME PERIOD COVERED:

EMBASE–unlimited initial date - 02/22/2016

Language: all

Search strategy:

```
'infant colic' or 'abdominal pain syndrome' or 'infantile colic' and
('epidemiology'/exp or 'epidemiology' or 'prevalence'/exp or 'prevalence' or
'incidence'/exp or 'incidence') and ([newborn]/lim or [infant]/lim or
[preschool]/lim) and ([article]/lim or [article in press]/lim or [review]/lim)
and [humans]/lim and 'rome criteria'
```

TOTAL: 1

Search #5C:

DATABASE SEARCHED & TIME PERIOD COVERED:

SCOPUS–unlimited initial date - 02/22/2016

Language: all

Search strategy:

(TITLE-ABS-KEY("INFANT COLIC" OR "ABDOMINAL PAIN SYNDROME" OR "INFANTILE COLIC")) AND (ALL("EPIDEMIOLOGY" OR "PREVALENCE" OR "INCIDENCE")) AND (ALL("ROME CRITERIA")) AND (TITLE-ABS-KEY("NEWBORN" OR "PRESCHOOL" OR "INFANT" OR "TODDLERS")) AND (LIMIT-TO(DOCTYPE,"ar")) AND (LIMIT-TO(SUBJAREA,"MEDI"))

TOTAL: 3

SEARCH #6

Search #6A:

DATABASE SEARCHED & TIME PERIOD COVERED:

PubMed—unlimited initial date - 02/22/2016

Language: all

Search strategy:

((((((((((("infantile diarrhea"[tiab] OR "functional diarrhea" AND ("epidemiology" OR "prevalence" OR "incidence")) AND ((infant[MeSH:noexp] OR infant[MeSH] OR infant, newborn[MeSH] OR child, preschool[MeSH])))) AND ROME criteria) AND ((infant[MeSH:noexp] OR infant[MeSH] OR infant, newborn[MeSH] OR child, preschool[MeSH])))) NOT editorial) NOT clinical trial) NOT case reports) NOT review) NOT letter) AND ((infant[MeSH:noexp] OR infant[MeSH] OR infant, newborn[MeSH] OR child, preschool[MeSH])))

TOTAL: 0

Search #6B:

DATABASE SEARCHED & TIME PERIOD COVERED:

EMBASE—unlimited initial date - 02/22/2016

Language: all

Search strategy:

'infantile diarrhea' OR 'functional diarrhea' OR 'infantile colic' AND ('epidemiology'/exp OR 'epidemiology' OR 'prevalence'/exp OR 'prevalence' OR 'incidence'/exp OR 'incidence') AND ([newborn]/lim OR [infant]/lim OR

[preschool]/lim) AND ([article]/lim OR [article in press]/lim OR [review]/lim) AND [humans]/lim AND 'rome criteria'

TOTAL: 0

Search #6C:

DATABASE SEARCHED & TIME PERIOD COVERED:

SCOPUS--unlimited initial date - 02/22/2016

Language: all

Search strategy:

(TITLE-ABS-KEY("INFANTILE DIARRHEA" OR "FUNCTIONAL DIARRHEA")) AND (ALL("EPIDEMIOLOGY" OR "PREVALENCE" OR "INCIDENCE")) AND (ALL("ROME CRITERIA")) AND (TITLE-ABS-KEY("NEWBORN" OR "PRESCHOOL" OR "INFANT" OR "TODDLERS")) AND (LIMIT-TO(DOCTYPE,"ar")) AND (LIMIT-TO(SUBJAREA,"MEDI"))

TOTAL: 0

SEARCH #7

Search #7A:

DATABASE SEARCHED & TIME PERIOD COVERED:

PubMed--unlimited initial date - 02/22/2016

Language: all

Search strategy:

((((((((((("infant dyschezia"[tiab] AND ("epidemiology" OR "prevalence" OR "incidence")) AND ((infant[MeSH:noexp] OR infant[MeSH] OR infant, newborn[MeSH] OR child, preschool[MeSH])))) AND ROME criteria) AND ((infant[MeSH:noexp] OR infant[MeSH] OR infant, newborn[MeSH] OR child, preschool[MeSH])))) NOT editorial) NOT clinical trial) NOT case reports) NOT review) NOT letter) AND ((infant[MeSH:noexp] OR infant[MeSH] OR infant, newborn[MeSH] OR child, preschool[MeSH])))

TOTAL: 1

Search #7B:

DATABASE SEARCHED & TIME PERIOD COVERED:

EMBASE-unlimited initial date - 02/22/2016

Language: all

Search strategy:

'infant dyschezia' AND ('epidemiology'/exp OR 'epidemiology' OR 'prevalence'/exp OR 'prevalence' OR 'incidence'/exp OR 'incidence') AND ([newborn]/lim OR [infant]/lim OR [preschool]/lim) AND ([article]/lim OR [article in press]/lim OR [review]/lim) AND [humans]/lim AND 'rome criteria'

TOTAL: 0

Search #7C:

DATABASE SEARCHED & TIME PERIOD COVERED:

SCOPUS-unlimited initial date - 02/22/2016

Language: all

Search strategy:

(TITLE-ABS-KEY("INFANT DYSCHYZIA")) AND (ALL("EPIDEMIOLOGY"OR "PREVALENCE"OR "INCIDENCE")) AND (ALL("ROME CRITERIA")) AND (TITLE-ABS-KEY("NEWBORN" OR "PRESCHOOL" OR "INFANT" OR "TODDLERS")) AND (LIMIT-TO(DOCTYPE,"ar")) AND (LIMIT-TO(SUBJAREA,"MEDI"))

TOTAL: 0

SEARCH #8

Search #8A:

DATABASE SEARCHED & TIME PERIOD COVERED:

PubMed-unlimited initial date - 02/22/2016

Language: all

Search strategy:

((((((((((("functional constipation"[tiab] OR "functional defecation disorder" OR "functional fecal retention" AND ("epidemiology" OR "prevalence" OR "incidence")) AND ((infant[MeSH:noexp] OR infant[MeSH] OR infant, newborn[MeSH] OR child, preschool[MeSH])))) AND ROME criteria) AND ((infant[MeSH:noexp] OR infant[MeSH] OR infant, newborn[MeSH] OR

child, preschool[MeSH])))) NOT editorial) NOT clinical trial) NOT case reports) NOT review) NOT letter) AND ((infant[MeSH:noexp] OR infant[MeSH] OR infant, newborn[MeSH] OR child, preschool[MeSH])))

TOTAL: 23

Search #7B:

DATABASE SEARCHED & TIME PERIOD COVERED:

EMBASE-unlimited initial date - 02/22/2016

Language: all

Search strategy:

'functional constipation' or 'functional defecation disorder' or 'functional fecal retention' and ('epidemiology'/exp or 'epidemiology' or 'prevalence'/exp or 'prevalence' or 'incidence'/exp or 'incidence') and ([newborn]/lim or [infant]/lim or [preschool]/lim) and ([article]/lim or [article in press]/lim or [review]/lim) and [humans]/lim and 'rome criteria'

TOTAL: 4

Search #8C:

DATABASE SEARCHED & TIME PERIOD COVERED:

SCOPUS-unlimited initial date - 02/22/2016

Language: all

Search strategy:

(TITLE-ABS-KEY("functional constipation " OR "'functional defecation disorder" OR "'functional fecal retention")) AND (ALL("EPIDEMIOLOGY"OR "PREVALENCE"OR "INCIDENCE")) AND (ALL("ROME CRITERIA")) AND (TITLE-ABS-KEY("NEWBORN" OR "PRESCHOOL" OR "INFANT" OR "TODDLERS")) AND (LIMIT-TO(DOCTYPE,"ar")) AND (LIMIT-TO(SUBJAREA,"MEDI"))

TOTAL: 8

References of full-text articles:

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eTable S1. Critical appraisal of eligible studies of the prevalence or frequency of functional gastrointestinal disorders (FGID) in infants and toddlers

Author, year, Country	Sample size (n)	Sample design, sampling method	Sampling frame	Measures	Unbiased assessor	Response rate, refusers	Prevalence rate, CI	Score and limitations
Tharner <i>et al.</i> , 2015, Netherlands	4823	Prospective cohort, All pregnant women from fetal life onward	Population-based birth-cohort in Rotterdam	Rome II CEBQ-parental	Interview w/ parents and children by investigators Physical examination	61%, Refusers described	16.5% CI given Subgroups	Score 7 Participation rate <70%
Van Tilburg <i>et al.</i> , 2015, USA	264	Cross-sectional, quota sampling	Nationwide community, Internet panelists	Rome III QPGS-RIII PedsQL4.0	Online panel w/ mothers	82.5%, Refusers not described	27.1% No CI given No subgroup	Score 2 Small sample size Quota sampling Internet panelists Online panel w/ mother Refusers not described No CI or subgroup
Kramer <i>et al.</i> , 2015, Netherlands	1292	Prospective cohort, 124 doctors in nationwide study	Cohort at well-baby clinics in Netherlands	Rome III and M-Rome III Parental questionnaire	Interview w/ parents and children by investigators	87%, Refusers described	3.9-17.3% / 0.9-6.5% No CI given	Score 6 Well baby setting No CI
Rouster <i>et al.</i> , 2015, USA	332	Cross-sectional, referred new patients < 18 yo	One tertiary care, Louisiana Child's Hospital	Rome III QPGS-RIII	Parental interviews by investigators	91%, Refusers described	52% No CI given No subgroup	Score 4 Small sample size Referred sample Specialty care setting No CI or subgroup

Turco <i>et al.</i> , 2014, Italy	402	Prospective cohort, consecutive admission of healthy newborns (parents interested on study)	Birth-cohort in 6 pediatric university-based hospitals	Rome III	Telephone interview w/ parents by trained pediatricians	86.4% (12 mo), Parents refused	10.7-11.6% No CI given Subgroups	Score 4 Small sample size Consecutive admission Specialty care setting No CI
Osakatul <i>et al.</i> , 2014, Thailand	3010	Cross-sectional, “unselected” infants and young children	Songklanagarind Hospital’s catchment area	Rome II and Rome III	Parental interviews by research assistant Laboratory exams	97.1%, Refusers described	1.6-1.9% No CI given Subgroups	Score 7 No CI
Mota <i>et al.</i> , 2012, Brazil	3799	Prospective cohort, All pregnant women from fetal life onward	Population-based birth-cohort; all children born in Pelotas and Capão do Leão	M-Rome II	Interviews w/ mothers by interviewers trained	92% (4 yo), Refusers described	27.3-31.0% No CI given Subgroups	Score 7 No CI
Liu <i>et al.</i> , 2009, China	5030	Cross-sectional, consecutive recruitment	12 communities in Minhang district of Shanghai, “random” sample	Rome III Questionnaire on GI symptoms	Parental questionnaire Parental interviews by research assistant	99.4%, Refusers described	1.4-17.9% No CI given Subgroups	Score 6 Consecutive admission No CI
Aydoğdu <i>et al.</i> , 2009, Turkey	193	Retrospective, referred patients to specialty care from 1999 to 2005	University-based general pediatric and specialty care unit	Rome II Iowa criteria	Medical records Laboratory exams	Not reported, Refusers unknown	51.9% No CI given No subgroup	Score 3 Small sample size Referred sample Specialty care setting No participation rate Refusers unknown

No CI or subgroup

Campanozzi <i>et al.</i> , 2009, Italy	2642	Cross-sectional, 59 out of 75 randomly selected pediatricians (medical visits in 2004)	Longitudinal assessment at primary care in north-central and southern Italy; all children from National Health Service	Rome II I-GERQ	Interview w/ parents and children by 59 pediatricians	76% of pediatricia ns Refusers not described (32.9% loss)	12% No CI given No subgroup	Score 4 Primary care setting All medical visits No participation rate No CI or subgroup
Primavera <i>et al.</i> , 2009, Italy	9291	Cross-sectional, 21 randomly selected family pediatrician	Longitudinal assessment at primary care in Sicily, Italy; all children from National Health Service	Rome II FGID questionnaire	21 pediatricians scores	Not reported, Refusers unknown	0.44% No CI given No subgroup	Score 4 Primary care setting All medical visits No participation rate No CI or subgroup
Miele <i>et al.</i> , 2004, Italy	9660	Cross-sectional, 13 out of 15 randomly selected pediatrician (medical visits in 1999)	Longitudinal assessment at primary care in Campania, Italy; all children from National Health Service	Rome II FGID questionnaire	Interview w/ parents and children by 13 pediatricians	87 % of pediatricia ns Refusers not described	0.07-0.76% No CI given No subgroup	Score 4 Primary care setting All medical visits No participation rate No CI or subgroup
Voskuijl <i>et al.</i> , 2004, Netherlands	45	Cross-sectional, consecutive admission	Referred children to one tertiary care (academic outpatient unit)	Rome II Iowa criteria	Patient diary Medical interviews w/ parents and children	65.7%, Refusers described	64%, No CI given No subgroup	Score 3 Small sample size Consecutive admission Specialty care setting

Physical
examination

Participation rate
<70%
No CI or subgroup

CI: confidence interval; yo: years old; mo: months; w: with; GI: gastrointestinal
Score: methodological strength of study (maximum 8) by Loney's criteria
CEBQ: Child Eating Behavior Questionnaire
M-Rome: Modified Rome criteria
QPGS-RIII: Questionnaire on Pediatric Gastrointestinal Symptoms - Rome III
PedsQL4.0 Pediatric Quality of Life version Inventory 4.0
I-GERQ: Infant Gastroesophageal Reflux Questionnaire