CHRONIC PELVIC PAIN: PREVALENCE, RISK FACTORS AND LAPAROSCOPIC UTEROSACRAL NERVE ABLATION

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Appendices to the thesis submitted to the Faculty of Medicine and Dentistry of the University of Birmingham for the degree of

DOCTOR OF MEDICINE

Academic Department of Obstetrics and Gynaecology

Faculty of Medicine and Dentistry

The University of Birmingham

June 2005

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Appendix 1.1: Contributions to the Chapters of the thesis

Chapter 1: Introduction

Pallavi Latthe

Chapter 2: Prevalence of chronic pelvic pain

Pallavi Latthe: Development of protocol and search strategy; Execution of literature searches; Literature selection, Data extraction, Data entry, Analysis, Drafting and revision of the manuscript

Mary Publicover: Search strategy, Execution of literature searches

Khalid S Khan: Development of the protocol, Supervision of the project, and Critical revision of the manuscript

Manish Latthe: Literature selection, Data extraction, Data entry, Analysis

Sudha Yanamandra: Some of the data entry in dysmenorrhoea table

M. Gulmezoglu, Say L: Critical revision of the manuscript

Daniel Wozdyal: Producing the Epimaps

Chapter 3: Risk factors in chronic pelvic pain: A systematic Review

Pallavi Latthe: Development of the protocol, Literature selection, Data extraction, Data entry, Analysis, drafting and revision of the manuscript.

Luciano Mignini: Literature selection, Data extraction, Data entry and figures 2 and 3

Mary Publicover: Development of the literature search strategy and literature search.

Robert K. Hills: Statistical input, figures and revision of manuscript

Richard Gray: Statistical advice and critical revision of the manuscript

Khalid S. Khan: Development of the protocol, supervision of the project, and Critical revision of the manuscript

J. Chan, Stefka Ritchie, Dr. Tomoo Shaktari, Dr. H. Kuntz: foreign language translations

K. Dunn and J. Golding: providing data

Chapter 4: Variation in practice of Laparoscopic uterosacral nerve ablation: A European survey

Pallavi Latthe: Design of questionnaire, synthesis of results, drafting and revision of the manuscript

Rebecca Powell: Distribution of questionnaire, data collection and entry

Jane Daniels: Design of questionnaire, Analysis

Robert K. Hills: Synthesis of results

Janesh Gupta: Critical Revision of the manuscript

Richard Gray: Supervision of the project and Critical revision of the manuscript

Khalid S Khan: Supervision of the project and Critical revision of the manuscript

Chapter 5: Measurement of 'prior' beliefs about effectiveness of laparoscopic uterosacral nerve ablation

Pallavi Latthe: Collation of data, synthesis of results, drafting and revision of the manuscript

David Braunholtz: Design of questionnaire, synthesis of results, revision of manuscript

Richard Lilford: Design of questionnaire, critical revision of the manuscript

Khalid S Khan: Supervision of the project and Critical revision of the manuscript

Chapter 6: Surgical interruption of pelvic nerve pathways for primary and secondary dysmenorrhoea

Pallavi Latthe: Selected studies for inclusion and exclusion, performed independent data extraction and quality assessment of the included trials for the 2004 update of the review and critical revision of the manuscript

Michelle Proctor: Development of protocol, Literature searches and retrieval, dta extraction, Analysis, and drafting and revising of the manuscript

Cindy Farquhar: Initiated and conceptualized the review, commented on drafts of the protocol and review.

Johnson NP: Revised drafts of the protocol and review, and contributed to interpretation of the data.

Khalid S. Khan: Critical revision of the manuscript

Chapter 6: A randomised controlled trial to assess the efficacy of Laparoscopic Uterosacral Nerve Ablation (LUNA) in the treatment of chronic pelvic pain: The trial protocol

Pallavi Latthe: development of trial protocol, recruitment of collaborating centres, recruitment of patients, day to day administration of the trial, presentations, publishing the protocol on Biomed Central and follow up of patients

The management group: Pallavi Latthe (PL), Khalid S Khan (KSK) Janesh K Gupta (JKG), Tara Selman (TS) from Department of Obstetrics and Gynaecology, Jane Daniels (JD), Robert K Hills (RKH) and Richard Gray (RG) from BCTU, and Richard Lilford (RJL) from Department of Public Health and Epidemiology, all from University of Birmingham, UK.

The collaborative group: It consists of clinicians and centres that recruit patients in this trial. They are: P Chein (Ninewells Hospital, Dundee, UK); K Chin (Staffordshire General Hospital, UK); M O'Connor, A Baxter, T Farrell (Royal Hallamshire Hospital, Sheffield, UK); LS Dwarakanath (City Hospital, Birmingham, UK); S Irani (Birmingham Heartlands and Solihull Hospital NHS Trust, UK); KSK, PL, JKG, C Mann, TJ Clarke, TS (Birmingham Women's Hospital, Birmingham, UK); V Kay (Forth Park Hospital, Kirkcaldy, UK); JS Samra, C Cox (New Cross Hospital, Wolverhampton, UK); S Keay (Walsgrave Hospital, Coventry, UK); E Shaxted (Northampton General Hospital, UK) and J Thornton (City Hospital, Nottingham, UK)

Data Monitoring Committee consists of P Brocklehurst, D Braunholtz and JA Jordan

Chapter 8 Conclusions and recommendation

Pallavi Latthe

Appendix 2: Supplementary data for Chapter 2: Systematic review of prevalence of chronic pelvic pain

Appendix 2.1: Medline search strategy for systematic review of worldwide prevalence of chronic pelvic pain

1. exp Pelvic Pain/ or pelvic pain.mp.
2. ((low$ adj3 abdom$) and pain).mp. [mp=title, abstract, cas registry/ec number word, mesh subject heading]
3. exp abdominal pain/
4. exp PAIN/
5. (pelvic or pelvis).mp. [mp=title, abstract, cas registry/ec number word, mesh subject heading]
6. 4 and 5
7. dysmenorrhoea.mp. [mp=title, abstract, cas registry/ec number word, mesh subject heading]
8. dysmenorrhea.mp. [mp=title, abstract, cas registry/ec number word, mesh subject heading]
9. (pain$ adj3 menstruation).mp. [mp=title, abstract, cas registry/ec number word, mesh subject heading]
10. (pain$ adj3 menses).mp. [mp=title, abstract, cas registry/ec number word, mesh subject heading]
11. (pain$ adj3 menstrual).mp. [mp=title, abstract, cas registry/ec number word, mesh subject heading]
12. (menstrua$ or menses).mp. and 4 [mp=title, abstract, cas registry/ec number word, mesh subject heading]
13. Period pain.mp. [mp=title, abstract, case registry/ec number word, mesh subject heading]
14. Painful periods.mp. [mp=title, abstract, case registry/ec number word, mesh subject heading]
15. exp DYSPAREUNIA/ or dyspareunia.mp.
16. (pain$ adj3 intercourse).mp. [mp=title, abstract, case registry/ec number word, mesh subject heading]
17. (pain$ adj3 coitus).mp. [mp=title, abstract, case registry/ec number word, mesh subject heading]
18. (pain$ adj3 (coitus or coital)).mp. [mp=title, abstract, cas registry/ec number word, mesh subject heading]
19. exp COITUS/ or coitus.mp.
20. sexual intercourse.mp.
21. (19 or 20) and 4
22. exp incidence/ or exp prevalence/
23. prevalent.mp.
24. frequency.mp.
25. exp Cross-Sectional Studies/ or cross-sectional.mp.
26. exp Colonic Diseases, Functional/ or irritable bowel syndrome.mp.

27. 26 not 1
28. 1 or 2 or 3 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 21
29. 22 or 23 or 24 or 25
30. 28 and 29
31. 30 not 27
32. limit 31 to female

Appendix 2.2: List of included studies in the systematic review of worldwide prevalence of chronic pelvic pain

Prevalence of dysmenorrhoea[1-103]
Dyspareunia[18;19;38;44;55;89-92;95;96;104-143]
Prevalence of Noncyclical pelvic pain[18;25;44;64;90;91;94-96;109;114;141;144-148]

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Appendix 2.3: Table of included studies on dysmenorrhoea

Author, country, language, year	Time period (mo)	Age (yrs)	Population characteristics	Definition	Measurement tool [+]	Response rate %	Representative (Y-yes, N-no)	Country resource*	Quality score (out of 5)	Cases	Denominator	Prevalence (95% CI)	Notes
Community based studies													
Pawloski, Poland, English, 2004	3	18-45	Between February 1999-December 2000, data was collected on entire community of one Mayan village; women over age 45 and those who had delivered in the last 9 months were excluded; 79 women were of Mayan ancestry, 67 were half Mayan and 31 women had no Mayan ancestry	Pain during menses sometimes or always	Interview (nv)	61.5	Y	2	1	50	177	28 (21.7-35.5)	
Weissman, USA, English, 2004	12	19-45	Participants were nurses who graduated between 1963-1984. They were surveyed twice at an interval of six	Menstrual cramps graded as none, minimal (can work, somewhat uncomfortable), moderate (can	Self administered questionnaire (nv)	73	N	1	2	301	404	74 (70-78.7)	

			years (1985, 1991) regarding menstrual cycle characteristics. In 1985 80% of respondents were over 25 years old and 60% were parous and all gave informed consent. 14% of women who reported endometriosis, PID or uterine fibroids in either 1985 or 1991 were excluded	work but quite uncomfortable) and severe (miss work, have to be in bed)							
Barnard, USA, English, 2003	12	28.5-43.1	Participants were a nationally representative randomly selected sample of women veterans who had made at least one ambulatory visit to a Veterans Affairs facility between July 1 1994 and June 30, 1995	Periods painful enough to interfere with usual schedule in the last 6 months	Structured questionnaire including SF 36	58.4	Y	1	3	682	1736	39.2 (37-43.6)
Schmidt, Brazil, Portuguese, 2002	6	12 to 19	School girls from Sao Leopoldo, 92/100 eligible as menstruating	Discomfort during periods in the last 6 months	Self administered questionnaire (nv)	90.9	Y	2	1	64	92	69.6 (59.1-78.7)
Walraven, Gambia, English, 2002	Not stated	15-54	20 villages were randomly selected for inclusion in the	Pain with menstrual periods that prevents normal	Semi-structured interviews	72.3	Y	3	2	85	607	14 (11.3-17)

			study, no specific exclusion criteria; 72% response rate15-54 year old women	activities in the last 3 months							
Yang JM, China, English, 2002	6	15-44	A epidemiological study was conducted on 296 non pregnant female workers exposed to mercury vapor and 394 female workers from food processing plants working for at least 1 year; women using Oral Contraceptives, intrauterine device or steroid hormones were excluded	Serious menstrual pain that affected work or required medication to relieve symptom before or during menstrual cycle	Self administered questionnaire (nv)	Not stated	N	2	0	42	394	10.7 (7.8-14.1)
Larroy, Spain, Spanish 2001	1	13-52	Women from urban and rural areas of Madrid were recruited from schools, universities, clinics, women's association, community centers, 0.4% were uneducated, 23.4% studied upto primary school level, 58.3% went to	Pain during menstruation without presence of any organic disease	Larroy's questionnaire (v)	Not stated	Y	1	2	859	1387	61.9 (59.3-64.5)

			secondary school and 17.9% were university educated, women who used OC or IUD or had gynaecological disease excluded									
Zondervan, UK, English, 2001	3	14-49	The women recruited in 1999 were registered with 85 general practices. One practice objected and hence their patients were excluded. Other exclusions were: mental illness (6), participation in the pilot study (5), 810 undelivered questionnaires	Pelvic pain with periods including irregular bleeding on oral pills or HRT	Semi structured self administered questionnaire (v)	74	Y	1	4	365	451	81 (77-84)
Dusek, Croatia, English, 2001	Not stated	15-21	Mean age of athletes 17.9+/- 2.1 non-athletes 17+/- 1.1The study involved female athletes from 3 Zagreb sports clubs as well as ballet dancers. The control group comprised of 3rd and 4th grade high	Painful menstruation (current)	Questionnaire (nv)	Not stated	N	1	1	76	163	57.3 (38.8-54.6)

			school girls from the school of textile design in Zagreb who did not take part in any sport activity. None of the girls used Oral Contraceptives.									
Balbi C, 2000, English, Italy	Not stated	14-21	Students from a professional institute in Naples were included	Pain accompanying menstruation localized in the abdominal inferior quadrants and radiates to inner thigh	Interview (v)	Not stated	N	1	1	201	356	56.5 (51.1-61.7)
Banikarim, USA, English, 2000	Not stated	13-18	Hispanic female adolescents, in grades 9 through 12, completed a 31-item questionnaire about the presence, duration, severity, treatment, and limitations of dysmenorrhoea at a local urban high school.	Painful menstruation during the previous 3 months and categorised as mild, moderate and severe	Self administered Questionnaire	Not stated	N	1	1	600	706	85 (82-87.1)
Gordley, USA, English, 2000	Not stated	18-21	Eligible military and civilian women employed at 10 US Air force bases with a mean age of 29.4 years and mean age at	Need for bed rest or missing work due to menstrual pain ever	Questionnaire (nv)	60.3	N	1	3	53	170	31.2 (24.3-38.7)

			menarche 12.7 years agreed to participate in all aspects of the total study; 61.8% were Caucasian, 56.8% were either married or had a permanent partner and were well educated, 8.2% smoked									
Mishra G, Australia, English, 2000	12	18-23	Study population were women aged 18-23 years who participated in the baseline survey of the Australian Longitudinal Study on Women's Health conducted in 1996, registered on the national Medicare database, oversampling from rural and remote areas, demographic and social background characteristics of respondents are broadly representative of Australian women in this age group, 41%	Severe period pain in the last 12 months	Self administered Questionnaire (v)	42	Y	1	3	5841	14762	39.6 (38.8-40.4)

			had never taken OC pills									
Di Wu et al, China, English, 2000	12	30-40	Subjects were non smokers, non drinkers, no physician diagnosed organic diseases; blood sample was taken for genotyping	Pelvic or lower abdominal pain associated with menstruation - recurrent/occasional and mild/moderate/ severe	Self administered Questionnaire (nv)	87	N	2	2	129	435	29.7 (25.4-34.2)
Vishwanathan, USA, English, 2000	Not stated	40-44	Part of detailed baseline study of the health status of college alumnae in 1996; half of whom were college athletes and half non-athletic classmates; 516 of these were eligible for inclusion in this study as they were aged 15-44 years and had had at least one pregnancy at the time of reporting; 460 of these were not sterilized and 56 were sterilized	Menstrual pain (current)	Self administered Questionnaire (nv)	Not stated	N	1	1	122	516	23.6 (20-27.6)
Hillen T, Australia, English, 1999	Not stated	15-17	47.4% respondents from private school, 34.3% from the state high school in higher SES area	Any type of pain or discomfort associated with menstrual periods including	Self administered anonymous Questionnaire(nv)	99	Y	1	1	309	384	80 (76.1-84.3)

			and 18.3% from lower SES area	cramps, nausea and headaches									
Kritz-Silverstein, USA, English, 1999	11	18-49	All women serving aboard navy ships were eligible; the study was part of the Women Aboard Navy ships Comprehensive Health and Readiness Research Project; mean age 26+/-6.1 years, 58% white, 32% black and 10% were other racial groups	Menstrual cramps requiring medication or time off work	Self administered Questionnaire (v)	63.1	N	1	2	704	2657	26.5 (24.8-28.2)	
Sultan, France, English, 1999	Not stated	14-18	High school students in the Herault district of France completed questionnaire, 39% with family history of dysmenorrhoea and 24% of the study subjects had a variety of psychological problems	Paroxysmal pain occurring before or during menstruation	Self administered Questionnaire (v)	Not stated	Y	1	3	902	4203	21 (20.3-22.8)	One third of the subjects with dysmenorrhoea reported absenteeism from school due to pain
Thongkrajai, Thailand, English, 1999	Not stated	15-55	Healthy 15-55 years old women from 4 villages in Nampong district, Khon Kaen Province were recruited	Dysmenorrhoea undefined over last 3 months	Interview (nv)	Not stated	Y	2	1	284	634	44.8 (40.9-48.8)	

			via a mobile health clinic to collect data, physical examination and specimen collection to screen for STD, 93.4% married, 85% farmers, 94.5% finished primary school and 20% subjects had abortion									
Golding, USA, English, 1998	Not stated	42.3; SE 0.5	Los Angeles Epidemiologic Catchment Area study- 44.4% latina, 44.2% European American and 11.4% other groups, mean education11.5 years; Latin residents were interviewed in English or Spanish according to their preference	Excessively painful menstrual periods	Diagnostic interview schedule (v)	86	Y	1	4	391	1428	27.4 (25.1-29.8)
Golding, USA, English, 1998	Not stated	Mean 43.9; SE 0.7	NC-ECA sample was selected to represent adults in 2 mental health catchment areas in North Carolina, one consisting of Durham County, which	Excessively painful menstrual periods	Diagnostic interview schedule (v)	79	Y	1	4	479	1703	28.1 (26-30.3)

			is primarily urban and the other consisting of 4 contiguous rural counties										
Golding, USA, English, 1998	Not stated	Mean 46.1; SE 0.8	In The national study of Health and Life Experiences of women; 84.3% were European American with mean education of 12.8 years	Excessively painful menstrual periods	Diagnostic interview schedule (v)	91	Y	1	4	430	963	44.6 (41.5-47.9)	
Pedron-Nuevo, Mexico, Spanish, 1998	Not stated	12 to 24	Healthy single females from a school in the south of Mexico city, were given anonymous questionnaire; menarcheal age 8-19 (average 12.3 years)	Dysmenorrhoea undefined (current)	Modified menstrual symptom questionnaire (v)	100	N	2	3	598	1066	56.1 (53.1-59.1)	Approximate rate
Campbell, USA, English, 1997	3	14-21	Mean age 16.26 years, a convenience sample that represented 96% of the female high school students attending a public high school in Halifax, Nova Scotia, were approached during class; 85% were English Canadian, 5% French Canadian; 0.7%	Any discomfort in association with the onset of menstruation that was not the result of an organic abnormality such PID in the last 3 cycles	Menstrual Distress Questionnaire (v)	80	N	1	2	269	289	93 (89.5-95.7)	

			of the participants were SE class I and 30% were class V									
Elahi, Pakistan, English, 1997	Not stated	12 to 18	Muslim girls from Multan city	Dysmenorrhoea defined by severity of signs and symptoms of pain during menses and the ability of the respondents to perform daily activity	Questionnaire (nv)	Not stated	N	2	2	529	696	76 (72.7-79.1)	
Harlow, USA, English, 1996	12	17-19	In 1985 nulliparous women not using OC pills or IUD and entering a local state university enrolled in a one year menstrual diary study, median age at menarche 13 years, 43% with long cycles, 20% smokers	Pain events associated with menstrual period in 12 months	Menstrual diary (v)	84	N	1	2	1000	1396	71.6 (69.2-74)	Value for observed bleeds, 13% reported having severe pain more than half the time
Hewison A, UK, English, 1996	Not stated	18-26	Nursing undergraduates were asked to participate in the study; 29% used oral contraceptive pills and 54 subjects had regular periods	Undefined	Questionnaire (nv)	56.5	N	1	0	47	70	67.2 (54.9-77.9)	93% used self treatment
Mathias, USA, English, 1996	6	18-50	In April-May 1994, the Gallup organization	Pelvic pain with periods including	Telephone interview (nv)	88.8	Y	1	2	90	5325	1.7 (1.4-2.1)	25% has seen some

	telephoned 17927 households by random digit dialing to identify women between 18-50 years; in women with more than one eligible woman, a computer generated algorithm identified the woman to be interviewed; demographic profile of the survey participants with CPP was similar to women with no CPP in terms of age, race, ethnicity, education (i.e. mean age 35.7+/-8.6 versus 36.7+/-8.6), 37% of women in both groups had less than a high school education, 10 vs. 11% had an advanced college degree, 86 vs. 82% were white, 7versus 9% were African American, 4 vs.	irregular bleeding on oral pills or HRT in the last 6 months		health care provider in the last 3 months; total indirect cost of CPP due to time lost from work $555.3 million and estimated direct medical costs for US population of 18-50 yr old women are $881.5 million per year.

			5% were latino										
Montero, Spain, English, 1996	12	14-20	Girls attending secondary schools in the municipality of Alcobendas, on the outskirts of Madrid were interviewed	Menstrual pain over the last 12 months	Questionnaire by interview (nv)	Not stated	Y	1	0	670	1146	58.5 (55.5-61.3)	Approximate rate
Skierska, Poland, Polish, 1996	Not stated	15-36	Mean age 22.04+/-4.6years, cohort from Warshaw, 5.3% with university education, 48.6% with secondary education, average height 165.5 cm, average BMI 20.9+/-2.5; mean age at menarche 12.9 years	Strong crampy pain in the suprapubic region or lower back sometimes associated with nausea or headache just before or with menses needing analgesia	Standard questionnaire - anonymous interview by trained interviewers (v)	95	Y	1	2	415	734	56.3 (52.9-60.2)	
Vicdan, Turkey, English, 1996	Not stated	11 to18	Between February-April 1992, 32 different schools with different socio-economic status in Ankara were chosen and 12 physicians administered the questionnaire to the school girls with average age 15.9 years; average menarcheal age was 13.28+/-1.09 yrs	Pain during menstruation	Questionnaire (nv)	Not stated	Y	2	3	10668	13665	78 (77.4-78.8)	25.6% of the girls with dysmenorrhoea missed school

Christiani, China, English, 1995	Not stated	20-40	Never smoking, textile workers, mean age 28.4 years, employed in 3 cotton mills in Anhui province China with varying levels of stress. All the women were middle or high school graduates, non-drinkers and married	Abdominal or pelvic pain during menstruation	Questionnaire (nv)	92	N	2	0	537	895	60 (56.7-63.2)	Among women with highest stress levels 74% experienced dysmenorrhoea, 64% and 53% for moderate and light levels of working stress
Jarrett, USA, English, 1995	2	21-44	Participants were screened to determine that they were currently menstruating regularly without using birth control pills or an IUD and had no history of gynaecological or gastrointestinal surgery/pathology or renal pathology; 83% were white and 64% had college degree.	Menstrual cramps for 3 days in 2 cycle	Health questionnaire menstrual diary (v)	78	N	1	1	27	61	44.3 (31.5-57.3)	
Onatra, Columbia, Spanish, 1994	3	10 to 19	Group A includes 481 adolescents of the urban area of Santafe de	Pain during menstruation divided into mild, moderate and severe by	WHO questionnaire (v)	95	Y	1	2	484	796	60.8 (57.3-64.2)	Dysmenorrhoea is less frequent and of

			Bogota, attending private school; Group B includes 285 adolescents attending state school and Group C includes 30 indigenous adolescents of the Tukano tribe from the rural area of Mitu, capital of Vaupes Adolescents filled up questionnaire; no other details provided	WHO typology								lesser intensity within the indigenous group than within the urban one
Messing, Canada, English, 1993	12	24-41	Women working in 17 poultry slaughterhouses and 6 canning factories in western France employed on 1/1/87 were randomly selected; 87 women eliminated due to menopause, 62 were pregnant or reported having been pregnant in the last 2 years and thus might not have resumed normal	Pain in the abdomen or lower back during menstrual periods or during the days preceding the period over last 12 months	Questionnaire (nv)	98.5	N	1	1	685	978	69 (66-71.9)	58% women had pain both preceding and during period

			menstruation, 2 had hysterectomies and in 4 the data was incomplete; data adjusted for age, contraceptive method and tobacco use, 249/720 women were on OC pills								
Ng, Singapore, English, 1992	12	15-24	From a sampling frame of all housing development board flats in Clementi town, a two stage cluster sampling was used to draw a random sample of 480 households; 30.3% Chinese, 28.8% Malay, 30.6% Indian; 36.8% married; 30.7% employed	One or more episodes of menstrual cramp or pain in the previous year not due to diagnosed gynaecological disease	Self administered questionnaire (nv)	79.6	Y	1	3	80	115	69.6 (60.3-77.8)
Ng, Singapore, English, 1992	12	25-51	From a sampling frame of all housing development board flats in Clementi town, a two stage cluster sampling was used to draw a random sample of 480 households; 30.3% Chinese,	One or more episodes of menstrual cramp or pain in the previous year not due to diagnosed gynaecological disease	Self administered questionnaire	79.6	Y	1	3	133	200	66.5 (59.5-73)

			28.8% Malay, 30.6% Indian; 36.8% married; 30.7% employed										
Cronje, South Africa, English, 1991	Not stated	19-21	Of the 10 boarding houses lodging female students on the campus of the university of the Orange Free state, Bloemfontein, 4 were randomly selected, all second year students were requested to complete a questionnaire; all were Caucasian and Afrikaans speaking who had attained menarche between 11 & 16 years	Dysmenorrhoea undefined	Questionnaire (nv)	78.5	N	2	3	92	102	90 (82.7-95.2)	37/102 (36%) experienced severe pain
Izzo, Italy, English, 1991	Not stated	16-23	Women from Campania belonging to the same race and socio-cultural background; one group practiced sport in their adolescent period and the other took part in sport occasionally	Pain which precedes by a few hours or accompanies menstrual flow	Self administered questionnaire (nv)	Not stated	Y	1	1	441	764	57.7 (54.1-61.3)	129/169 (76.3%) women did not practise sports regularly had dysmenorrhoea
Lee, USA, English, 1991	12	21-50	Data from a larger study of	Cramps just before or at the	Self administered	69	N	1	2	321	594	54 (49.9-58.1)	30.7% experienc

			women working as nurses in seven hospitals on the west coast. Excluded subjects were over 50 years of age, not menstruating, or had been pregnant or lactating during the six months prior to completing the questionnaire; each worked 32-55 hours per week, 86.1% Caucasian, 58.3% married or partnered, 53.5% had been pregnant and 65.8% had no living children at home	start of menstrual period over last 6 months	questionnaire (v)								ed cramps every month; 34.2% rarely
Odujinrin, Nigeria, English, 1991	Not stated	10 to 18	10-18 years old secondary school girls were randomly selected and surveyed, 889/950 had attained menarche, 35.8% had irregular cycles and 78.6% had flow between 3-5 days	Pain during menstruation graded on a multidimensional verbal scoring system	Self administered questionnaire (nv)	Not stated	N	2	2	638	889	71.7 (68.7-74.7)	350 (39.40%) had mild, 197 (22.2%) had moderate and 91(10.2%) had severe dysmenorrhoea
Robinson J, USA, English, 1991	6	10 to 18	The data are from a three wave panel	Cramps during menstrual period in 3-6	Telephone interview (v)	89	N	1	3	245	308	79.6 (74.6-83.9)	18.2% reported severe

			study of <18 unmarried females, non pregnant, adolescents wishing contraception who attended a Planned Parenthood clinic in Baltimore during 1988, 77% black inner city population, 58% had been pregnant and 12% had given birth	months									dysmenorrhoea on Andersch-Milsolm scale
Bukman, Holland, English, 1990	Not stated	21-42	Volunteers were obtained from a general practitioner, had no wish to become pregnant and were not using oral contraceptives or an intrauterine device	Painful menstrual flow or pelvic pain during menstruation	Questionnaire (v)	52.7	N	1	1	33	39	84.6 (69.5-94.1)	Healthy volunteers
Holmlund U, Sweden, English, 1990	Not stated	25-26	All girls attending a classroom session in 1973 in 8th grade in the city of Norrkoping, a medium size Swedish city	Severe dysmenorrhoea undefined	Attitude interest schedule, Cesarec Marke Personality Schedule (v)	73	Y	1	3	150	357	42 (36.8-47.3)	23/150 (15%) had dysmenorrhoea that limited their daily activity
Okonofua, Nigeria, English, 1990	Not stated	16-24	Women athletes participating in the bi-annual	Undefined	Questionnaire (v)	Not stated	N	2	1	47	133	35.3 (27.3-44.1)	

			interuniversity games held at university of Abadan, Nigeria in April 1986 were approached; subjects' age weight, height ranged between 16-28 years, 42 and 83 kg and 51 and 75 inches respectively; non-contact sports athletes were younger, lighter and leaner than contact sports athletes									
Sundell, Sweden, English, 1990	12	24	19 year old women resident in Gothemberg born in 1962 were studied in 1981; 596 women were surveyed in 1986, 1 woman had died and 6 emigrated with 453 women still resident in Gothenburg	Painful menstruation with severity defined by verbal multidimensional scoring system	Questionnaire (v)	83	Y	1	3	308	489	63 (58.5-67.3)	72% in the same women 5 years earlier
Thomas, Nigeria, English, 1990	Not stated	15-24	The female students of Obafemi Awolow University, Nigeria, with mean age 19.8+/-2.4,	Presence of pain during menstruation	Questionnaire (nv)	Not stated	Y	2	2	555	768	72.3 (69-75.4)	

			median age at menarche 13.5 years, 64.3% had 26-28 menstrual cycle and 26.8% participated in competitive sporting activities										
Bang RA, India, English, 1989	Not stated	Mean 32.1	Survey conducted in Gadchiroli district of Maharashtra, India in two villages; all females over age 13 years were invited to participate; 25% of the non participating sample surveyed and found to be similar to study sample	Undefined	Interview (nv)	59	Y	2	3	269	468	57.5 (52.9-62)	
Fisher, USA, English, 1989	8	16-18	The survey was administered between Sept.85-May 86, to female patients and friends (mean age 17.6 years) in the waiting room of the Five Towns Adolescent Health Service, a general health facility for teenagers located in a	Mild, moderate, severe dysmenorrhoea in the last cycle	Premenstrual Assessment form (v)	100	Y	1	3	180	207	87 (81.6-91.2)	25% mild, 39% moderate and 23% severe

			middle to upper-middle class suburb of New York City between Sep 1985-May 1986; predominantly white (86%), most were catholic (55%) or Jewish (32%), 59% were in high school									
Teperi, Finland, English, 1989	12	12 to 18	All (3370) girls born in consecutive days in July 1964, 66, 68 and 70 derived from National Population registry	Menstrual pain-mild, moderate or sever needing medication or leading to absenteeism from work or school	Questionnaire (v)	87	Y	1	3	1876	2932	64 (62.2-65.7)	
Busch, USA, English, 1988	Not stated	18-39	Nursing students were recruited from undergraduate and graduate classes at a university and a community college; women older than 39 years or those who did not list their age or had hysterectomy or had missing data were excluded; average age 25.1 years, 62% single, 26%	Severe cramps during menses	Questionnaire (v)	61.8	N	1	2	141	503	28 (24.1-32.2)	26.8% report seeking medical treatment

			married, 38% protestants, 39% catholic, 13% Jewish; 17% used oral contraceptives; 34% used other contraceptive methods										
Clarvit, USA, English, 1988	Not stated	21-46	Questionnaire was placed in the school mailboxes of every female medical student at Albert Einstein College of Medicine in Bronx, New York along with an introductory letter explaining the purpose of the study and that all responses would be anonymous	Painful menstrual cramps before and during medical school	Self administered questionnaire (nv)	63	N	1	1	116	159	73 (65.3-79.7)	71.1% prevalence before medical school
Johnson J, USA, English, 1988	Not stated	14-18	Students from two separate school settings in or near a metropolitan Midwestern community were surveyed; mean age 15.8 years, 6.6% social class I and mean age at menarche was 12.5 years	Painful menstruation (current)	Self administered questionnaire (nv)	100	Y	1	2	136	182	74.7 (67.8-80.9)	21/136 (15.5%) had used a prescription medication
Pullon, New Zealand, English, 1988	1	16-54	Of women surveyed from Wellington	Pain with periods	Self administered questionnaire	96	Y	1	2	772	1456	53 (50.4-55.6)	176 women (12%)

			region in 1 week in June 1985,80% of the women who were currently menstruating were included in the analysis; (30 GP surgeries randomly selected and 76% of the surgeries approached participated)		(nv)								severe enough to take time off work or school; 176/1546 (12%) reported pain lasting 3 days or more and 520/1456 (36%) reported pain lasting for 2 or more days
Gruber, USA, English, 1987	1	17-24	Women recruited from Introductory Psychology classes at a Midwestern university; mean age 18.5 years, average menstrual flow 5.2 days	Dysmenorrhoea according the MSQ-R scale in the last cycle	Menstrual symptom questionnaire -revised, menstrual activity questionnaire (v)	Not stated	N	1	1	207	293	70.6 (65.1-75.8)	
Silberg, Australia, English, 1987	16	18-53	Between November 1980-March 1982, 1233 pairs monozygotic and 751 pairs dizygotic twins were surveyed and repeatability was tested after 3 months; both twins were menstruating	Moderate or severe pain during period severe enough to limit normal activity or to require medical treatment	Questionnaire (v)	64	Y	1	2	1296	2492	52 (50-54)	

			regularly and neither was pregnant at the time of completing questionnaire; mean age 29+/-8 years									
Toriola, Nigeria, English, 1986	4	18-26	Nov. 1984-Feb.1985, mean age 24.1 years, athletes in various sports with at least 3 years experience of national level competitive sports; non-athletes between 19-28 years with a mean age of 24.6 years were selected from women attending secondary schools, colleges or universities in the same localities where the athletes trained; 2and 3% of athletes and non athletes were excluded because they were unwilling to provide information on menarcheal age and other menstrual characteristics,	Dysmenorrhoea undefined (current)	Questionnaire (nv)	Not stated	N	2	0	175	1081	16.2 (14-18.5)

			data on 8.79% of athletes and nonatheletes was excluded because in incompleteness, use of OCs, pregnancy or breastfeeding or medical treatment that interfered with normal endocrine function										
Whorwell, UK, English, 1986	Not stated	18-54	Age, social class matched controls for patients with IBS recruited from staff registers of local commerce and industry after completing a screening questionnaire to exclude subjects with IBS who were about 11% of the group	Dysmenorrhoea undefined	Interview-Questionnaire (nv)	Not stated	N	1	2	42	90	46.7 (36.1-51.5)	
Flug, Switzerland, English, 1985	72	12 to 21	This study is part of the first Zurich Longitudinal Study of growth and development; the girls were followed for the first six years after menarche	Recurrent abdominal cramping at the time of menstrual flow for 6 months	Interview (v)	Not stated	Y	1	4	95	140	67.9 (59.4-75.5)	
Lemasters, USA, English, 1985	Not stated	Not stated	Workers in Styrene	Dysmenorrhoea undefined	Questionnaire (nv)	Not stated	N	1	0	86	615	14 (11.3-17)	25/156 (16%)

			industry, 123 in low exposure job, 51 in high-exposure job; 449 unexposed women-117 in unexposed jobs in styrene industry, 176 had jobs outside the plastic industry and 156 were unemployed	(current									dysmenorrhoea in unemployed
Mergler, Canada, English, 1985	Not stated	15-35	Part of the health study undertaken at the request of the employees of 8 Quebec poultry slaughterhouses - women working in 8 poultry houses and controls were full time housewives married to male slaughterhouse workers who were not pregnant, not menopausal, not amenorrhoeic or not undergone hysterectomy; 75% of the workers and 53.5% of the housewives used OC pills, 83.8% and 61% respectively	Lower abdominal pain during last period	Questionnaire (nv)	100	Y	1	2	211	318	66.4 (60.9-71.5)	

			were nulliparous										
Scambler, UK, English, 1985	Not stated	15-44	Women registered with two health centres serving a new estate on the eastern fringes of London	Pain before or during a period in 6 weeks	Moos Menstrual Distress Questionnaire (v)	62.7	Y	1	3	24	79	30.4 (20.5-41.4)	
Wilson, USA, English, 1984	18	14-16	All new female students entering a large independent coeducational secondary school answered a questionnaire about their menstrual history as part of health record in 1980 and 1981, follow up questionnaires and menstrual calendars were obtained on 3 separate occasions, mean age 15.45+/-1.11 years, mean age at menarche 12.57+/-1.12 years, 72.5% with regular cycles, 250 boarders and 64 day students, 313 white and 14 black students	Dysmenorrhoea divided into mild, moderate and severe type (current)	Questionnaire (v)	Not stated	N	1	4	185	327	56.6 (51-62)	76//185 (41.1%) took prescription or non prescription medication for dysmenorrhoea95 (31.7%) had mild 45(15%) had moderate and 17 (5.7%)had severe dysmenorrhoea
Andersch B, Sweden, English,	Not stated	19	A sample of 1in 4 women born	Painful menstruation	Questionnaire (v)	90.9	Y	1	4	432	596	72.4 (68.7-76)	15% suffered

1982			in 1962 (out of 2621), residing in Gothenburg city was obtained from the population register and these women were invited to participate in 1981; 3.1% used IUD and 10.1% women had been pregnant once.	with severity defined by verbal multidimensional scoring system								from dysmenorrhoea that limited daily activity
Woods NF, USA,English, 1982	5	18-35	A population of non pregnant women residing in five neighbourhoods of a large south-eastern city with varied racial composition and SE status was chosen in 1979	Dysmenorrhoea undefined	Moos Menstrual Distress Questionnaire (v)	74	Y	1	3	30	179	16.8 (11.6-23.1)	
Klein J, USA, English, 1981	Not stated	12 to 17	Data from the national health examination survey cycle III collected between 1966-1970 by the National Centre for Health Statistics	Abdominal pain or discomfort in relation to menses	Questionnaire (v)	100%	Y	1	3	1611	2699	59.7 (57.8-61.5)	This includes occasional mild pain; 44.17% have pain sometimes or always
Svanberg L, Sweden, English, 1981	Not stated	10 to 19	The present study was carried out on 502 girls in primary and secondary schools in Malmo, Sweden	Dysmenorrhoea undefined	Questionnaire (nv)	100%	Y	1	2	216	502	43 (38.6-47.5)	Occasional or consistent dysmenorrhoea

			with mean age 15 years; 66% of the subjects reported that they had the menarche between 12 and 13 years of age, mean duration of menstrual flow was 4-5 days, 72% had dysmenorrhoea within the 1st year of menarche									
Iglesias, Mexico, English, 1980	Not stated	Not stated	Medical service of the company polled at random airline stewardesses at the time they applied for assistance of a variety of clinical problems, personnel using contraception or suffering from obvious general or gynaecological problems were excluded	Dysmenorrhoea undefined	Interview (nv)	Not stated	N	2	1	34	200	17 (12.1-22.9)	
Sogbamu, Nigeria, English, 1979	Not stated	12 to18	Survey sample included residential pupils from one of the secondary schools in Ondo, Nigeria	Dysmenorrhoea undefined	Questionnaire (nv)	100	N	2	0	38	119	31.9 (23.7-41)	38% of those with dysmenorrhoea had analgesics prescribed by the school

													nurse
Webster, USA, English, 1979	Not stated	<25	58 students and 217 young working women were instructed to answer each item of the questionnaire but not to spend too much time on any single item; 102 were taking Oral Contraceptives, 17 had Intrauterine devices	Spasmodic and congestive dysmenorrhoea	Menstrual distress questionnaire (v)	Not stated	Y	1	2	221	275	80.4 (75.2-84.9)	
Widholm, Finland, English, 1979	Not stated	13-20	Control series of case-control study with mean age 15.7 years from two school classes who underwent same examination; mean age at menarche 13 years-study done in 1967. In order to obtain a picture of the need for drugs for pain relief and absenteeism, this second similar study was done	Dysmenorrhoea undefined	Questionnaire (nv)	Not stated	N	1	1	35	97	36.1 (26.6-46.5)	% Calculated from responders; 3.2% consulted doctor; 9.3% absent from schools due to pain.
Wood, Australia, English, 1979	Not stated	15-53	Data from menstruating women attending Shepherd foundation for	Menstrual pain undefined	Menstrual distress questionnaire (v)	Not stated	N	1	2	1856	2343	79.2 (77.5-80.8)	Includes occasional mild pain; 44.17% have pain

			comprehensive health check										sometimes or always
Khatri, India, English, 1978	Not stated	20-40	Parous women residing in sector 10,11, 15 and 22, educated, married and not using IUD, OCs or tubal ligation for contraception were chosen if they had re-established menses after the last delivery. Women who gave history of recent dilatation and curettage were also excluded. Mean age of menarche 14.5 years, average cycle length 28-33 days with average of 5 days of bleeding	Dysmenorrhoea undefined	Interview (nv)	Not stated	N	2	0	291	1000	29.1 (29-29.4)	16.9% was mainly of congestive type; 9% severe and 60.1% mild dysmenorrhoea.19.6% of women with dysmenorrhoea took analgesics, 14.3% bed rest and 1% took hormones
Malina, USA,English, 1978	Not stated	<25	21subjects from university of Texas in Austin; college athletes, nonatheletes and Olympic basketball athletes; all except one white; 27 non-athletes were volunteers from physical	Dysmenorrhoea undefined	Interview (nv)	Not stated	N	1	1	7	27	25.9 (11.1-46.3)	Non athletes

			instruction classes who had not participated in interscholastic sports at any school level										
Sheldrake, UK, English1976	Not stated	14-18	Survey was carried out on the student population registered for study at Edinburgh university for the academic year 1974-75, 756/3298 were taking oral contraceptive pill, mean cycle length 29.1 days	Stomach ache during period	Questionnaire (nv)	88.4	N	1	1	1458	3298	44.2 (42.5-45.9)	40.8% for women taking Oral Contraceptives and 32% for women on Oral Contraceptives for over 2 years
Bergsjo P, Norway, English, 1975	Not stated	19-50	Subjects examined were employed in an electrical/technical company in Oslo and in textile industry in Bergen	Pain shortly before or during menstruation during the last 3 months	Questionnaire (v)	Not stated	N	1	1	28	54	52 (37.8-65.7.)	23% of the whole sample had contacted Dr for dysmenorrhoea; 31% absent from work; 28% had to stay in bed
Timonen, Finland, English1973	Not stated	18-27	Sample was drawn by sending a questionnaire to one-tenth of the female students at the university	Menstrual pelvic pain	Questionnaire (nv)	Not stated	Y	1	0	116	234	49.6 (43-56.2)	

			of Helsinki and to female students at the Institute of Physical Education, Jyvaskyla; 65% were 21-24 years old										
Widholm and Kantero, Finland, English, 1971	Not stated	10 to 20	No information available	Dysmenorrhoea undefined	Questionnaire (nv)	Not stated	N	1	1	5155	5485	94 (93.3-94.6)	
Sehgal, India, English, 1971	Not stated	16-25	College girls of Banaras Hindu university residing in 3 hostels inside the university campus were interviewed; 82.3% were from urban areas and 91% were Hindus; 79.5% were below 21 years of age and 5.2% were married	Dysmenorrhoea - mild if girls attended to daily work without analgesics, moderate if girls could attend classes with analgesics and severe if they had to miss classes due to discomfort	Proforma (nv)	83.8	N	2	3	172	358	48 (42.8-53.4)	
Theano, Spain, English, 1968	Not stated	17-32	Unmarried girls at college, mean age 22 years, resident in college, average age of the menarche was 13.3 years	Mild, moderate, severe dysmenorrhoea	Questionnaire (v)	Not stated	N	1	2	56	60	93.3 (83.8-98.1)	28.3% mild, 36.7% moderate and 28.3% severe
Hirt,USA, English, 1967	Not stated	<25	Freshman student nurses at a large metropolitan hospital, relatively homogenous in age and socio-	Mild moderate or severe pain before or during menstruation	Semi-objective criteria for teenage dysmenorrhoea and 16 personality factor	100	N	1	2	81	105	77 (67.9-84.7)	

			economic status were surveyed; all received physical examination		questionnaire (v)								
Widholm, Finland, English, 1967	Not stated	11 to 21	Series of secondary school pupils who visited Folkhalsan teenagers' clinic with various symptoms including leucorrhoea, premenstrual tension, fatigue, headache etc. were included; mean menarcheal age 13.2 yearsControl series mean age 15.7 years from two school classes who underwent same examination; mean age at menarche 13 years	Dysmenorrhoea undefined	Not specified	Not stated	Y	1	2	190	514	37 (32.8-41.3)	38.1% for hospital and 24.4% for community
Kessel, UK, English, 1963	Not stated	17-32	Details not available	Mild, moderate, severe dysmenorrhoea	Questionnaire (v)	Not stated	N	1	2	424	500	84.8 (81.3-87.8)	32.4% mild, 36.5% moderate and 15.9% severe
Golub, USA English, 1958	Not stated	12 to 18	16183 girls in 16 Philadelphia public high schools which represents over	Lower abdominal cramping pain at the time of menstrual flow	Interview (nv)	Not stated	Y	1	2	10938	16183	67.6 (66.9-68.3)	Any dysmenorrhoea

			90% of the girls attending these schools, percentage of Negro students varied from school to school, ranging from 0 to 80.5%										
Clow, UK, English, 1924	60	12 to 22	Interview of healthy girls was taken by the author	Slight, sub acute and disabling dysmenorrhoea	Interview (v)	Not stated	N	1	1	451	2050	22 (20.2-23.9)	4% required bed rest during pain
Hirata, Japan, Japanese, 2002	1	18 to 21	Of the college students, 34.8% of them belonged to the underweight group (BMI < 19.8), 53.8% to the normal group (19.8 < or = BMI < 24.2) and 11.4% were overweight (BMI > or = 24.2)	Menstrual pain regularly, sometimes or seldom	Questionnaire (nv)	84	Y	1	2	1876	2282	82.2 (80.6-83.8)	
Mijanovic, Macedonia, Roman, 1990	Not stated	10 to 19	Randomly chosen adolescent females, aged 10 to 19 years, were questioned about their (painful or painless) menstruation	Painful menstruation	Examination (v)	Not stated	Y	1	2	565	1068	52.9 (49.9-55.9)	
Shye, Israel, English, 1991	Not stated	16 to 21	Cohort of adolescents were studied for premenstrual symptoms and menstrual pain;	Painful menses in the past	Questionnaire by interview (nv)	Not stated	Y	2	1	381	545	70 (65.9-73.7)	25% experienced pain severe enough to interfere

			Girls of Asian or African ethnic origin reported consistently higher perimenstrual distress than those of Israeli or Western origin										with daily activities in the past 3 cycles
Barros, Brazil, Spanish, 1987	Not stated	18-24	Organização Santamarense de Educação e Cultura University students were interviewed on voluntary participation	Not stated	Light, moderate and severe dysmenorrhoea	Questionnaire-interview (nv)	N	2	0	768	1006	76.3	40,4% light form; 27,8% form moderate and 8,2% severe form
Rojas, Colombia, Spanish, 1997	Not stated	12 to 23	Cross sectional study of adolescents in a school; 7% incapicitated for 2/3 days and 12% for a day by pain during menses	Not stated	Pain during menses mild, moderate or intense	Visual analogue scale	N	2	1			83.2	
Nunez, Venezuela, Spanish, 1991	3 months	16-30	20,20% of the total of the female population of 3787 students during the period between January and March of 1988 were surveyed	Not stated	Pain during menses	Not specified	N	2	0	536	765	70	
Gonzalez, Chile, Spanish, 1999	1 month	16-25	Cross sectional study of students of the Faculty of Education of the	95	Dysmenorrhoea unspecified	Self administered questionnaire	Y	2	2	207	242	85.5	

			Pontificia Catholic University of Chile			(nv)								
Pena Nina, Dominican Republic, Spanish, 1993	Not stated	Not stated	laborers of business of zone franca and banking institution of the city of Holy Sunday were surveyed.	Not stated	Dysmenorrhoea unspecified	Not clear	N		2	0			55.3	
Hospital/community clinic based studies														
El-Defrawi, Egypt, English, 2001	Not stated	Not stated	Patients of maternal and childhood centre, Islamia were gynecologically examined and psychosexual interview was taken by interviewers who were blind to the woman's circumcision status, 200 circumcised and 50 were uncircumcised	Dysmenorrhoea undefined	Semistructured psychiatric interview based on Arabic version of the sexual behavior Assessment Schedule-adult (SEBAS-A)(v)	87		N	2	1	161	200	80.5 (74.3-85.8)	Circumcised women
Gurel, Turkey, English, 1998	Not stated	18-56	Women with various gynaecological complaints admitted in the dept. were included in the study. All were married and 14 were nulliparous. Those having previous pelvic	Primary dysmenorrhoea influencing daily life or requiring analgesia	Questionnaire (nv)	Not stated		N	2	1	134	235	57 (50.4-63.4)	

			surgery including caesarean section, those with pelvic mass, uterine anomaly, pregnancy or intrauterine device were excluded										
Jamieson DJ, USA, English, 1996	3	18-45	Two O&G and three family medicine practices in North Carolina were surveyed between February-April 1993, on 5 consecutive days, all nonpregnant women were asked to participate including women who were accompanying patients but were nonpatients themselves (31%), 14 (4%) refused to fill in the survey, 35 questionnaires were excluded for incompleteness, 14 were excluded for race other than	Pain with menstrual periods currently	Questionnaire (nv)	96	N	1	1	482	533	90 (87.6-92.8)	75% of those with pain take medication; 8% miss one day of work on average per month

			African-American or white, 14 widowed women and 42 women were excluded for missing marital status data. 74.2% white, 32% had finished college, 7% had less than high school education, 21% single, 67% married and mean age 31.9+/-7.2 years										
Taner, Turkey, English, 1995	3	26-40	Multiparous women due to undergo sterilization filled a questionnaire, none of them had had any pelvic operation before sterilization, OC and IUDs were discontinued 2 months prior to sterilization	Mild moderate or severe pain during menstruation	Questionnaire (nv)	Not stated	N	1	0	31	43	72.1 (56.3-84.7)	35/43 (81.4%) had dysmenorrhoea after sterilization; 11, 11 and 9 had mild, moderate and severe dysmenorrhoea respectively
Shah, UK, English, 1994	8	21.8-46.2	Control group of a case control study done between Dec. 1991-August 1992 matched for age, parity and smoking	Painful menstruation divided into mild-not affecting daily activity and analgesics rarely required,	Interview (nv)	Not stated	N	1	1	34	55	61.8 (47.7-74.6)	14/34 had mild, 14/34 had moderate and 6/35 and severe dysmenor

			recruited from the genitourinary and family planning clinics (8 HIV seronegative and rest unknown)	moderate- daily activity occasionally affected but absence from work rare, simple analgesics effective; severe-daily activity clearly affected and poor response to analgesics								rhoea
Rulin M, USA, English, 1993	36	mean 28	Low income, ethnically and regionally diverse women from three participating institutions; women taking OC (147) in the control group were excluded from analysis; modified Pomeroy technique used for puerperal sterilisation; interval sterilisation was done by falope bands or bipolar electrocautery, control group - women who had never been sterilised and a subset of this group not using OCS with mean age of 27 years	Bad menstrual cramps over 3-4.5 years	Questionnaire+ interview (v)	78	N	1	3	131	819	16 (13.5-18.7)	Values for women undergoing sterilization- 16% (80/500) 95% CI- 12.9-19.511.6 % preoperatively, 15.9% 8-11 months later

Mahmood, UK, English, 1991	Not stated	Not stated	Questionnaires were sent to patients attending Aberdeen Royal Infirmary who were to have laparoscopy for sterilization, infertility, chronic abdominal or pelvic pain and abdominal hysterectomy for dysfunctional uterine bleeding- data given here is on women having laparoscopy for infertility or sterilization	Dysmenorrhoea undefined (current)	Self administered questionnaire (nv)	98.7	N	1	0	402	910	44.2 (40.9-47.5)	61% with endometriosis, 40% with pelvic adhesions and 41% with normal pelvis had dysmenorrhoea
Walker, USA, English, 1991	Not stated	>/=18	Attenders at Women's clinic (operated by dept. of O&G) and Family medical centre (university based primary care clinic) were approached; patients are racially and ethnically diverse and approximately 20-30% are assisted by public assistance programmes;	Excessive menstrual pain (current or lifetime)	Questionnaire (nv)	95	N	1	1	246	631	39 (35.2-42.9)	

			mean age of patients at Family medical centre more at 37.4+/-16.1yrs vs. 32.1+/-11.2 years, no other significant differences of clinical relevance										
Stambolov, Bulgaria, Bulgarian, 1988	60	19-41	Women hospitalised in medical institute, Pleven, Bulgaria with a diagnosis of adnexitis between 1979-1984 and 1985-86; controls were healthy fertile women	Painful menstruation (current)	Interview (nv)	100	N	1	1	8	100	8 (3.5-15.1)	24% in women with history of adnexitis
Cavanagh, USA, English, 1986	Not stated	12 to 18	Girls with mean age 14.9 years were surveyed during their visit to the Adolescent Clinic at the Upstate Medical Centre; 15 black, 1 Hispanic and 34 white girls; 24 middle and 18 lower income families; 26 lived in the city and 5 in rural areas with 19 from suburbs; 46/50 were postmenarcheal	Dysmenorrhoea undefined (current)	Self administered confidential questionnaire (nv)	92	N	1	1	22	46	47.8 (32.9-63.1)	4/46 sought medical attention

			and 24 were menstruating regularly									
Liu, UK, English, 1986	Not stated	26-48	Study included 75 patients who were admitted for laparoscopic sterilization during menstruation; they all gave informed consent, the social status was biased towards semi-skilled workers; 7% nulliparous, 14 Para 1, 36 Para 2	Dysmenorrhoea undefined (current)	Questionnaire (nv)	Not stated	N	1	0	41	75	54.5 (42.7-66.2)
Sobczyk, USA, English, 1978	Not stated	Not stated	Two age matched study groups were selected from patient records at the Family practice centre of MUSC using the clinic's PDP-15 system from those without a coded diagnosis of dysmenorrhoea; half of these were taking Propoxyphene containing medications; 45 and 52% respectively in the two groups were in the 20-29 year age	Dysmenorrhoea in the preceding 2 months	Interview (nv)	57	N	1	0	56	85	65.9 (54.8-75.8)

			group								
Gray, UK, English, 1960	Not stated	13-17	Based on a study of 200 private. Patients who presented themselves to the gynecologist for examination; 4 had primary amenorrhea	Dysmenorrhoea undefined	Not specified	Not stated	N	1	0	55	196	28.1 (21.9-34.9)

*Country resource- 1: developed; 2-less developed; 3-least developed

[+] v-validated; nv-not validated

Appendix 2.4: Table of included studies on dyspareunia

Author, country, language, year	Time period (mo)	Age (years)	Population characteristics	Definition	Measurement tool[+]	Response rate %	Representative (Y-yes, N-no)	Country resource *	Quality score (out of 5)	Cases	Denominator	Prevalence (95% CI)	Notes
Community based studies													
Abdo CHN, Brazil, English, 2004	3	23.3-37.9	The Brazilian Study of Sexual Behaviour used a sample of 2835 subjects (53% women and 47% men) in 10 cities of seven Brazilian states. The group studied comprised convenience sample of women with an educational level (high school and college degree) higher than that of the average Brazilian woman; the sample was comparable in terms of race and religion. Subjects were weekend visitors of beaches, parks and shopping malls. Data on women who declined to answer were not recorded and hence comparisons of the answering sample were not taken into account. For statistical analysis, only women who had had sexual intercourse with at least one partner in the past 12 month period were selected	Pain during sexual intercourse (current)	Self administered anonymous questionnaire (nv)	Not stated	N	2	0	280	1212	23.1 (20.8-25.6)	

Johnson, USA, English, 2004	24	18-96	Epidemiological Catchment area project, a multistage probability study of incidence and prevalence of psychiatric disorder; random sample of adult community residents in the St.Louis was queried on DSM III sexual dysfunction, largely Caucasian population, 43% respondents 45 years or older; 22% were currently single an had never married, 7% of the sample reported being in poor health	Physically painful sexual relations ever	Interview (v)	Not stated	Y	1	3	19	1801	3.7 (2.6-5)	
Oberg, Sweden, English, 2004	Not stated	18-65	Nationally representative population of sexually active Swedish women included in a epidemiological investigation; able to communicate in Swedish language, living in Sweden at the time of investigation and mentally and physically capable of participation; 19% did not menstruate of which 95% were over 50 years old	Genital pain in the last 12 months during intercourse	Face to face interview with questionnaire (v)	Not stated	Y	1	3	39	1056	1.1 (0.6-1.6)	
Cain, USA, English, 2003	Not stated	42-52	SWAN is a national study of mid-life women conducted in two phases at 7 US sites. Women age 42-52 either Caucasian or site-designated other ethnicity; having menses within the previous 3 months; having an intact uterus and at least one ovary; no use of medications affecting reproductive hormones within the previous 3 months were recruited in 1996-97. 5 women who responded that they never had sex but	Pain or discomfort during intercourse sometimes or always in the last 6 months	Questionnaire (v)	99	Y	1	5	508	2406	21.1 (19.5-22.8)	Sample size estimation done

			reported having intercourse in the last 6 months were excluded from the analyses. Analyses was limited to women who had sex in the last 6 months								
Danielsson, Sweden, English, 2003	4	20-60	Between Dec.1998-April 1999, all women who participated in the screening programme for cervical cancer in a mixed but chiefly urban region in Sweden were asked to answer a short questionnaire after oral consent was obtained; 7 women who never had intercourse were omitted as were women who did not understand the written language	Dyspareunia that had lasted at least 6 months (ever)	Questionnaire (nv)	96	Y	1	2	281	3017	9.3 (8.3-10.4)
Desai, India, English, 2003	6	16-50	This cross sectional study done between Feb-Sept. 2000, included sex workers from a red light area of Surat, India to measure prevalence of STI and HIV; mean age of participants was 28.5 yrs	Dyspareunia causing problems with intercourse	Interview (v)	95.2	N	2	2	15	118	12.7 (7.3-20.1)
Nazareth, UK, English, 2003	Not stated	18-75	13/37 approached London GP practices situated in areas of high, medium and low socio-economic deprivation participated. People who consented to take part completed questionnaire, by pen and paper or computer assisted interview; no significant differences in Jarman scores (which indicate socio-economic deprivation) between participating and nonparticipating practices; 71% of those who agreed to	Pain in genitals during or after sexual intercourse	Modified brief sexual function questionnaire (v)	71	Y	1	3	31	1065	3 (2-4.1)

			participate also agreed for scrutiny of their records; one quarter of the participants were non-white; 11% of the women were bi or homosexual								
Kadri, Morocco, English, 2002	Not stated	20-80	Mean age of the sample (n=728) was 36.76+/-12.6 years, 29% had no education, 78% pursued no professional activity and 58% were married; 491/728 women satisfied the criteria "sexually active or having a regular sexual relationship"; 464 responded to this question	Genital pain associated with sexual intercourse (it may also occur before or after intercourse) often or always in the last 6 months	Questionnaire (v)	94.5	Y	2	3	35	464	7.5 (5.3-10.3)
Avis N, USA, English, 2000	60	51-61	Study sample derived from a substudy of the Massachusetts Women's Health study that began with a large random population based cross sectional survey of 8050 middle-aged women. From this study, a cohort of 543 women aged 45-55 years as of 1.1.82 who had menstruated in the preceding 3 months and not had hysterectomy/ oophorectomy were screened as eligible to participate in this phase	Pain in the pelvic area during or after sexual intercourse during the last 6 months seldom to always	Sexual Activity Questionnaire (v)	78.6	Y	1	5	46	202	22.8 (17.2-29.2)
Zhao G, China, English, 2000	Not stated	41-60	402 professional urban women and 404 farmers from rural area out of whom 29.2% were illiterate; mean age at menopause 47.3+/-4.6 years; 1.1% of the women used HRT and they all lived in the city	Painful intercourse undefined	Structured interview (v)	Not stated	Y	2	2	158	773	20.4 (17.6-23.5)

Bhurt, Pakistan, English, 1999	6	37+/-12.3	Trained females conducted interviews using a pretested sindhi questionnaire in 8 villages of rural Jamshoro, Sindh. They were ever-married; 74% were illiterate; 83.6% were housewives; 7.5% were nulliparous and 15% had menstrual irregularities	Pain during intercourse during the 6 months prior to interview	Interview (v)	98	Y	2	3	36	738	4.9 (3.4-6.7)
Dunn K, UK, English, 1999	Not stated	18-75	Sample was 4000 people between 18-75 years registered with four general practices diverse in geographical location and level of urbanization; reminders sent to nonresponders, 58% of women were on medications and 24% had anxiety while 6% women suffered from depression	Dyspareunia undefined	Questionnaire with reply paid envelope (v)	44	Y	1	3	115	650	17.5 (14.7-20.7)
Laumann. USA, English, 1999	12	18-59	The national health and social life survey conducted in 1992 is national probability sample of 1410 men and 1749 women between the ages of 18 and 59 years living in households throughout the USA; only those respondents who had a partner in the last 12 months were analysed. Excluded women tended to be older and single.	Painful intercourse over past 12 months	Questionnaire (v)	79	Y	1	4	230	1479	15.5 (13.7-17.5)
Thongkrajai, Thailand, English, 1999	3	15-55	Healthy women from 4 villages in Nampong district, Khon Kaen Province were recruited via a mobile health clinic to collect data, physical examination and specimen collection to screen for STD, 93.4% married, 85% farmers,	Painful intercourse in the previous 3 months	Interview (nv)	Not stated	Y	2	2	124	634	19.6 (16.5-22.9)

			94.5% finished primary school and 20% subjects had abortion								
Golding, USA, English, 1998	Not stated	Mean 42.3; SE 0.5	Los Angeles Epidemiologic Catchment Area study- 44.4% latina, 44.2% European American and 11.4% other groups, mean education11.5 years; latino residents were interviewed in English or Spanish according to their preference	Physical pain during sexual relation or not pleasurable sexual relations for many months	Diagnostic interview schedule (v)	86	Y	1	4	394	1428	27.6 (25.3-30)
Golding, USA, English, 1999	Not stated	Mean 43.9; SE 0.7	NC-ECA sample was selected to represent adults in 2 mental health catchment areas in North Carolina, one consisting of Durham County, which is primarily urban and the other consisting of 4 contiguous rural counties	Physical pain during sexual relation or not pleasurable sexual relations for many months	Diagnostic interview schedule (v)	79	Y	1	4	305	1703	17.9 (16.1-19.8)
Golding, USA, English, 2000	Not stated	Mean 46.1; SE 0.8	In The national study of Health and Life Experiences of women 84.3% were European American with mean education of 12.8 years	Physical pain during sexual relation or not pleasurable sexual relations for many months	Diagnostic interview schedule (v)	91	Y	1	4	538	963	56 (55.8-62.1)
Ventegodt, Denmark, English, 1998	12	18-88	In 1992, a representative sample was taken from the Danish population from the CPR register by selecting a particular date in the year and then selecting all persons born on that date from 1904 and every fifth year thereafter until 1974 including the year 1961; unclear whether value given is for currently sexually active women or all women	Pain or discomfort during intercourse	Questionnaire (v)	60.7	Y	1	3	23	753	3.1 (1.9-4.5)

Barlow D, UK, English, 1997	1	55-75	A six country pan-European study of urogenital ageing, 55.6% married and 3.1% living with partner; 35.9% city dwellers; median age at menopause 50 years for the whole study; 18.5% hysterectomy rate with bilateral oophorectomy in 48.8% of them; 1503/3062 women had been in sexual relationship over the past year. It is unclear whether the results given are for sexually active population or whole age range	Painful sex/sexual relations in the month prior to study	Interview (v)	65	Y	1	3	64	1503	4.3 (3.3-5.4)
Jamieson DJ, USA, English, 1996	3	18-45	Between Feb-April 1993, two O&G and three family medicine practices were surveyed on 5 consecutive days, all nonpregnant women were asked to participate including women who were accompanying patients but were nonpatients themselves (31%), 14 (4%) refused to fill in the survey, 35 questionnaires were excluded for incompleteness, 14 were excluded for race other than African-American or white, 14 widowed women and 42 women were excluded for missing marital status data. 74.2% white, 32% had finished college, 7% had less than high school education, 21% single, 67% married and mean age 31.9+/-7.2 years	Pain during and / or after intercourse over 1 year	Questionnaire (nv)	96	Y	1	2	193	423	45.7 (40.8-50.5)

Stenberg A Sweden, English, 1996	1	61	Study was done in June 1993, all women in the county born during the 14 months Dec 1931 through to Jan 1933 were included; the majority of nonresponders (n=170) did not return the questionnaire. 19% of the non responders were immigrants as compared to 13% of the responders; 632/1076 who responded were sexually active	Dyspareunia undefined	Questionnaire (v)	84	Y	1	3	259	632	41 (37.1-44.9)	
Ramoso-Jalbuena, Philippines, English, 1994	12	40-55	90% residing in Metro Manila and10% of the sample was obtained from the private clinic; varied professions, 62% college graduates; 61% in full time employment; age at menarche 13 years and 75% lived with husband; typical respondent of Malay race, 47 years old, 154 cm tall and weighing 54 kg	Painful intercourse undefined	Interview using IHF questionnaire (v)	Not stated	N	2	2	58	500	11.6 (8.9-14.7)	21/58 (36.2%) consulted doctor18/21 were prescribed medications and 10/18 followed the prescription; 10% subjects recruited from clinic
Ernst Zurich, Switzerland, English, 1993	120	20-30	Sample of the Zurich study was selected in 1978 from a survey of 2201 females reaching age 20 years; randomly selected women were followed up with four interviews in 10 years	Dyspareunia over the previous 1 year	Interview (v)	72.9	Y	1	3	13	216	6 (3.2-10.1)	
Lindal, Iceland, English, 1993	12	55-57	Between March 1988-89, subjects who were born in 1931 and still living in Iceland on Dec.1, 1986, evenly distributed throughout the country were recruited. Of the 1195 randomly chosen subjects, 90 did not meet criteria for inclusion because they had	Functional dyspareunia undefined duration	Diagnostic Interview schedule (v)	79.3	Y	1	3	13	417	3.1 (1.7-5.3)	

			moved to Iceland in early adulthood or were living abroad and 19 were dead										
Rekers H, Netherlands, English, 1992	Not stated	35-80	Study was conducted in the city of Zoetermeer with a population mix that reflects composition of Dutch population at large, in conjunction with the Bureau for Population Registration, a stratified sample was drawn from the city register; no consistent differences in the response rate by age, women living in residential homes for the elderly or who were receiving institutional care for other reasons were excluded	Dyspareunia undefined	Mailed questionnaire (nv)	67.7	Y	1	2	81	1299	6.2 (5.0-7.7)	
Glatt, USA, English, 1990	Not stated	Early 30s	Participants for this survey were sought from a group of 500 women who had taken part in a study of sexually transmitted micro-organisms in 1974-75; at the time of study the subjects were students at a large urban university	Discomfort or pain in labial, vaginal or pelvic area during or after intercourse from sexual debut	Questionnaire (nv)	73.4	N	1	1	105	313	33.5 (28.3-39.1)	51 had primary and 54 secondary dyspareunia which developed 10.2 years on average after sexual debut Of 105 women, 22 had dyspareunia rarely, 58 occasionally 17 frequently and 8 always

Bang RA, India, English, 1989	Not stated	Mean 32.1	Survey conducted in Gadchiroli district of Maharashtra, India in two villages; all females over age 13 years were invited to participate; 25% of the non participating sample surveyed and found to be similar to study sample	Undefined	Interview + examination (	59	Y	2	2	43	654	6.6 (4.8-8.8)	
Berg G, Sweden, English, 1988	12	60-62	All women aged 60, 61 and 62 living in the community of Linkoping sent questionnaires, response rate was equally distributed among the three age groups but no further information available on nonresponders; 881/1469 women were sexually active; all women were postmenopausal; 12% nulliparous; 15% had undergone major gynaecological surgery; 7% were receiving estrogens at the time of the study; 60% sexually active, the rate being higher in HRT users.	Local vaginal discomfort resulting in sexual difficulties	Questionnaire (nv)	72	Y	1	2	287	881	32.6 (29.5-35.8)	
Osborn, UK, English, 1988	Not stated	35-59	Study was based on two Oxford group practices with computerised age and sex registers which was used to select sample of 600, consisting of 100-150 women in each of five age bands; of the respondents 436 women with male sexual partner were interviewed	Pain or discomfort causing difficulties during sexual intercourse more than half of the time during the previous 3 months	Semistructured interview (v)	87	Y	1	3	30	379	8 (5.4-11.1)	0/86 in 35-39, 1/87 in 40-44, 6/69 in 45-49, 11/65 in 50-54 & 12/72 in 55-59 years age groups
Whorwell, UK, English, 1986	Not stated	18-64	Age, social class matched controls for patients with IBS recruited from staff registers of local commerce and industry after completing a screening	Dyspareunia undefined	Interview-Questionnaire (nv)	Not stated	N	1	1	5	90	5.55 (1.8-12.5)	

			questionnaire to exclude subjects with IBS who were about 11% of the group									
Iosif C, Sweden, English, 1984	Not stated	61	In 1982, out of approximately 3000 women born in 1921, in a defined geographical area in south Sweden, the administrative district of Malmohus county, 1200 were randomly selected from the community register for the present investigation. 21% had undergone gynaecological operations; 4% were currently on HRT and 29.2% had urinary incontinence	Vaginal dryness with difficulty in intercourse	Mailed questionnaire (nv)	99.2	N	1	1	343	902	38 (34.8-41.3)	
Garde, Denmark, English, 1980	15	40	In 1976-1977, subjects were participants in a health examination intended to illuminate risk factors for illness in a 40 yr old population group (all were born in 1936) selected from the health service registers in particular municipalities in Copenhagen	Pains during intercourse	Interview (nv)	94	Y	1	2	1	79	1.3 (0.03-6.8)	
Hospital/community clinic based studies												
Castelo-Branco, Chile, English, 2003	5	40-64	Between May-October 2001, consecutive healthy women with mean age 52.4+/-5.7 years attending southern metropolitan health service in Santiago, Chile were included. 82.8% were peri or postmenopausal, 23% had received HRT and 79.2% were sexually active. The	Dyspareunia-DSM	Questionnaire (v)	Not stated	N	2	3	147	423	30.2 (25.7-34.6)	Sample size estimation done; 3/27, 35/145, 59/136, 31/68 dyspareunia in 40-44, 45-49, 50-54 &55-59

			inclusion criteria were: healthy women accompanying patients at health centres whose ages were between 40-64 years. Women with mental disorders or who had difficulty in understanding the survey were excluded. An expert committee translated the instrument into Spanish.									years age groups respectively
Danaci, Turkey, English, 2003			Women who attended the GOPD of Celal Bayar university hospital were recruited, exclusion criteria were: having a gynecologic disorder, chronic medical disorder, surgical menopause, psychiatric disorder, using HRT and being illiterate. Women were divided into 3 groups according to their menopausal status: those with regular menses were premenopausal, those with irregular menses in the last year were perimenopausal and those with no menses in the last year were postmenopausal.	Painful intercourse in the last 6 months	Interview on sexual desire, behavior, Beck's Depression Inventory and STAI (v)	90	N	2	1	148	324	45.7 (40.2-51.3)	Postmenopausal- 34/116; Perimenopausal- 24/84; Premenopausal-54/124
Nappi, Italy, English, 2002	Not stated	46-60	Women coming to ten menopause clinics located in different areas of Italy who satisfied the following criteria were consecutively enrolled: being married, having at least 1 child, having a spontaneous menopausal status of at least 6 months with FSH>30 mIU/l, coming for first consultation and being	Painful intercourse undefined	Visual scale for sexual symptoms questionnaire (v)	Not stated	N	1	1	106	355	29.8 (25.1-34.9)	

			negative for gynaecological diseases Exclusion criteria were: HRT, pelvic surgery, chronic diseases, intake of neuroactive drugs, smoking > 10 cigarettes a day and regular alcohol consumption										
El-Defrawi, Egypt, English, 2001	Not stated	Not stated	Patients of maternal and childhood centre, Islamia were gynaecologically examined and psychosexual interview was taken by interviewers who were blind to the woman's circumcision status, 200 circumcised and 50 were uncircumcised	Dyspareunia undefined	Semistructured psychiatric interview based on Arabic version of the sexual behavior Assessment Schedule-adult (SEBAS-A) (v)	Not stated	N	2	1	108	250	43.2 (37-49.6)	
Versi, UK, English, 2001	Not stated	Postmenopausal age group	Women consecutively seen at Dulwich Menopause Clinic in London for non urogenital complaints related to climacteric and had never been on HRT were included; 70 (25%) women reported no sexual activity	Painful intercourse since menopause	Questionnaire (nv)	93.2	N	1	1	23	215	10.7 (6.9-15.6)	
Shokrollahi, Iran, English, 1999	Not stated	16-53	Women were selected randomly from all those applying for services at the family planning department of 3 health and treatment canters in Tehran. The participants met 4 criteria: their husbands had only one wife; no recent life crisis; no disorder or illness or drug use that would affect sexual function and they were of reproductive age, not pregnant and had not recently given birth; all participants were Muslim and relatively well educated, 72% had a diploma or university degree	Dyspareunia on most or all occasions	Brief index of sexual functioning for women and sex knowledge and attitude test (v)	Not stated	N	2	2	30	300	10 (6.8-14)	6% had dyspareunia 50% of the times and 4% always

Gurel, Turkey, English, 1998	Not stated		In Jan-June 1995, women with various gynaecological complaints admitted in the dept. were included in the study. All were married and 14 were nulliparous. Those having previous pelvic surgery including caesarean section, those with pelvic mass, uterine anomaly, pregnancy or intrauterine device were excluded	Painful sex/sexual relations in the month prior to study	Questionnaire (nv)	Not stated	N	2	2	72	235	30.6 (24.8-37)
Ismael, Malaysia, English, 1994	Not stated	40-60	Study population consisted of 70% Malays, 13% Chinese and 17% Indians; 10% were either patients who came to gynaecology clinic or nursing staff; 76% of these women were married and living with husbands; 23% had ceased sexual activity, 15% were perimenopausal and 34% were postmenopausal	Dyspareunia undefined	Interview/questionnaire (nv)	Not stated	N	2	0	32	400	8 (5.5-11.1)
Shah, UK, English, 1994	8	21-46	Control group of a case control study done between Dec. 1991-August 1992 matched for age, parity and smoking recruited from the genitourinary and family planning clinics (8 HIV seronegative and rest unknown)	Dyspareunia undefined	Interview (nv)	Not stated	N	1	1	9	51	17.6 (8.4-30.8)
Rosen, USA, English, 1993	Not stated	18-73	Healthy women mean age 43.6+/-11.9 years, enrolled in a Women's Wellness Centre; two thirds were married or living with partner and most women were employed outside home 28.4% were not sexually active at the time of study, 28% were postmenopausal and 2.4% were pregnant	Dyspareunia undefined	Brief Index of Sexual Satisfaction and Health Background Questionnaire (v)	Not stated	N	1	2	65	236	27.6 (21.9-33.7)

Pepe F, Italy, English, 1991		6	15-58	In 1987, healthy women who attended a private gynecologist for routine cervical smear and breast examination and who reported a steady heterosexual relationship with only one partner for more than 1 year were approached; no woman had been drug abuser or treated for sexual dysfunction, all were born in Catania or its province, all were roman catholic, most had attended primary school upto different levels, none was postmenopausal, 56.1% were married and 20.5% used Oral contraceptives	Painful coitus	Interview (nv)	100	N	1	1	40	360	11.1 (8.1-14.8)
Mahmood, UK, English, 1991	Not stated	Not stated		Subjects were patients attending Aberdeen Royal Infirmary who were to have laparoscopy for sterilization, infertility, chronic abdominal or pelvic pain and abdominal hysterectomy for dysfunctional uterine bleeding- data given here is on women having laparoscopy for infertility or sterilization	Dyspareunia (current) of undefined duration	Questionnaire (nv)	98.7	N	1	1	180	910	19.8 (17.2-22.5)
Robinson J, USA, English, 1991		3	>/=18	The data are from a three wave panel study of <18 unmarried females, not pregnant, adolescents wishing contraception who attended a Planned Parenthood clinic in Baltimore during 1988, 77% black inner city population, 58% had been pregnant and 12% had given birth	Intercourse is sometimes or always painful	Telephone interview (v)	89.9	N	1	2	82	308	26.6 (21.8-31.9)

Walker, USA, English, 1991	Not stated	>18	In March 1989, attenders at Women's clinic (operated by dept. of O&G) and Family medical centre (university based primary care clinic) were approached; patients were racially and ethnically diverse and approximately 20-30% are assisted by public assistance programmes; mean age of patients at Family medical centre more at 37.4+/-16.1yrs vs. 32.1+/-11.2 years, no other significant differences of clinical relevance	Coital pain (lifetime or current)	Questionnaire (nv)	95	N	1	1	271	631	43 (39-46.9)
Bachmann, USA, English, 1989	15	18-87	White, middle class and high school educated women seeking gynecologic evaluation were interviewed over 15 months	Undefined	Interview (nv)	100	N	1	1	142	887	16 (13.7-18.6)
Chapman Dudley J, USA, English, 1989	20	Not stated	Between 1986 march to November1987; 30 women were recruited from rape crisis centre and control group from private gynecologic medical practice; 80% white, 13% Hispanic and 7% black. In the geographic area in this study, people in distress can telephone the personal help line or sexual assault line for assistance. After the acute situation was attended to, the women were asked whether they would participate in a sexual and gynecologic evaluation to be repeated every 6 months over 4 year period as were the controls	Pain during arousal or orgasm	Questionnaire (nv)	Not stated	N	1	0	3	35	9 (1.8-2.3)

Schein, USA, English, 1988	Not stated	18-78	People attending family practice centre participated in the study on sexual identity and function; mean age 35 years; 70% females; 54% black; 63% married and 37% belonged to social class I and II	Undefined	Questionnaire (v)	Not stated	N	1	1	31	148	21 (14.7-28.4)	
Warner, UK, English, 1987	36	<21->56	3 years' work of a co-ordinated clinical service or sexual problems was surveyed; this involved 5 clinical settings and equal distribution between male and female presenters	Undefined	Case records (v)	100	N	1	1	64	577	11 (8.6-13.9)	
Heisterberg, Denmark, English, 1986	12	Reproductive age group	The patients included in the present study comprised of women who had participated in a clinical controlled trial in 1978-79 on prophylactic antibiotics and development of postabortal PID. Before the abortion, information about previous births, spontaneous and induced abortions, episodes of PID, and the occurrence of CPP were obtained	Dyspareunia of undefined duration	Questionnaire (nv)	77	N	1	1	21	338	6.2 (3.9-9.3)	
Plouffe, Canada, English, 1985	Not stated	22-79	Sexually active women admitted on a elective basis to general gynaecology wards with mean age 37.6+/-1.5 years were studied; 38 were Anglo-American; 39 French; 68 roman catholic; 75 married; 63 not using contraception	Deep dyspareunia of undefined duration	Questionnaire (nv)	Not stated	N	1	0	20	98	20.4 (12.9-29.7)	
Buddeberg, Germany, German, 1984	12	17-63	Between 1981-1982, women attending a family practice with a mean age 31.2 years with different problems were approached, majority were employed and 18 were housewives; 67% were lower	Painful intercourse of undefined duration	Questionnaire (nv)	45.2	N	1	0	13	83	15.7 (8.6-25.3)	3/83 had dyspareunia for < 1 month

			or middle rank workers									
Levine, USA, English, 1976	Not stated	30-39	Every third Black woman attending a gynecology clinic at University Hospital of Cleveland for nonsexual complaints were invited to participate, most of whom were born and raised in the South; had completed 10-12 year of formal education; were Protestant; all but 3 were mothers and most were currently not married; most belonged to the lowest socio-economic class	Undefined	Interview (nv)	78.7	N	1	1	2	59	3.4 (4.1-11.7)

Appendix 2.5: Table of studies included in the systematic review on prevalence of noncyclical pelvic pain

Author, country, language, year	Time period (mo)	Age (years)	Population characteristics	Definition	Measurement +	Response rate %	Representative ness (Y-yes/ N-no)	Country resource*	Quality score (out of 5)	Cases	Denominator	Prevalence (95% CI)	Notes
Community based studies													
Desai, India, English, 2003	7	16 to 50	This cross sectional study of volunteers done between Feb.-Sept. 2003 included sex workers from a red light area of Surat, India to measure prevalence of STI and -HIV; mean age of participants was 28.5 yrs	Pain in lower abdomen of undefined duration	Interview (v)	95	N	2	1	23	118	19.5 (12.8-27.8)	Sex workers community
Bhurt, Pakistan, English, 1999	3	37+/-12.3	Trained females conducted interviews using a pretested sindhi questionnaire in 8 villages of rural Jamshoro, Sindh, using convenience sampling. They were ever-married; 74% were illiterate, 83.6% were housewives, 7.5% were nulliparous and 15% had menstrual irregularities	Lower abdominal pain with or without vaginal discharge or fever during the 6 months prior to interview	Interview (v)	98	N	2	2	65	738	8.8 (8.76-9.28)	Sample size estimation done
Thongkrajai, Thailand, English, 1999	12	15-55	Healthy women from 4 villages in Nampong district, Khon Kaen Province were randomly recruited via a mobile health clinic to collect data, physical examination and specimen collection to screen for STD, 93.4% married, 85% farmers, 94.5% finished primary school and 20% subjects had abortion	Lower abdominal pain in the previous 3 months	Interview (nv)	Not stated	Y	2	2	275	634	43.4 (39.5-47.3)	
Zondervan, UK, English, 1999	60	12 to 70	One hundred and thirty-six general practices in the UK. One practice objected and hence their patients were excluded. Other exclusions were: mental	Recurrent or constant pain in the area from navel down	Semistructured questionnaire (v)	74	Y	1	4	24040	284162	8.46 (8.4-8.6)	Monthly prevalence of CPP 21.5/100

			illness (6), participation in the pilot study (5), 810 undelivered questionnaires. Cases were identified randomly on the basis of contact with their general practice pain due to malignancy, chronic inflammatory bowel diseases or pregnancy, or which occurred only during menstruation or sexual intercourse, was excluded	in the lower belly of at least 6 months duration unrelated to periods or intercourse.									0 and incidence 1.58/1000 with an annual prevalence of 38.3/1000Monthly prevalence rates in 15-20 year old 18.2/1000 and >60 27.6/1000. Monthly prevalence in Scotland and Wales were 16/1000 and 29.4/1000 respectively. Sample size estimation done
Filippi, Turkey, English, 1997	3	Average 32	Women randomly sampled from a clinic based community register on current and past contraceptive uptake, reproductive health problems and symptoms of ill-health,	Abnormal vaginal discharge and lower abdominal pain in the	Questionnaire (v)	80	N	2	2	139	694	20 (17.1-23.2)	

			pregnant women excluded; all were invited to the health centre for follow-up medical assessment for reproductive morbidities. Those who refuse the medical phase were younger, better educated and less likely to report ill-health	previous three months									
Jamieson DJ, USA, English, 1996	3	18 to 47	In February-April 1993, two O&G and three family medicine practices were surveyed on 5 consecutive days, all nonpregnant women were asked to participate including women who were accompanying patients but were nonpatients themselves (31%), 14 (4%) refused to fill in the survey, 35 questionnaires were excluded for incompleteness, 14 were excluded for race other than African-American or white, 14 widowed women and 42 women were excluded for missing marital status data. 74.2% white, 32% had finished college, 7% had less than high school education, 21% single, 67% married and mean age 31.9+/-7.2 years	Pain in lower abdomen not counting menstrual pain over 1 year	Questionnaire (nv)	96	Y	1	2	227	581	39 (35.1-43.2)	16% of overall sample (45.3% of the sufferers) took medicati on for nonmens trual, noncoita l pain
Mathias, USA, English, 1996	2	18 to 50	In April-May 1994, the Gallup organisation telephoned 17927 households by random digit dialling to identify women between 18-50 years; in women with more than one eligible woman, a computer generated algorithm identified the woman to be interviewed; demographic profile of the survey participants with cpp was similar to women with no cpp in terms of age, race, ethnicity, education (i.e. mean age 35.7+/-8.6 versus	Chronic pelvic pain for at least 6 months experienced off and on or constantly in the last 3 months	Telephone interview (nv)	89	Y	1	2	773	5325	14.7 (13.6-15.8)	25% has seen some health care provider in the last 3 months; total indirect cost of cpp due to time

			36.7+/-8.6, 37% of women in both groups had less than a high school education, 10 vs. 11% had an advanced college degree, 86 vs. 82% were white, 7versus 9% were African American, 4 vs. 5% were latino. Responses from pregnant and postmenopausal women were excluded										lost from work $555.3 million and estimate d direct medical costs for US populati on of 18-50 yr old women are $881.5 million per year.
Bhatia, India, English 1995	Not stated	16 to 35	Study conducted in 1991 in the subdistrict of Karnataka state, 70 km from Bangalore on women who had at least one child younger than five.2400 from rural areas; all eligible women living in the town and in the 48 villages having population of at least 500 persons were included	Lower abdominal pain or vaginal discharge with fever between 3 to 13+ months	Interview (nv)	95	Y	2	2	187	3600	5.2 (7.1-8.9)	
Kirkengen, Norway, English, 1993	Not stated	20 to 49	Women recruited from a single general practice in Oslo in 1989-1990, they were consecutive attenders for gynaecological problem other than pregnant or after abortion or delivery; 9 women with poor knowledge of Norwegian were excluded	Pelvic pain undefined for 12 months	Interview (v)	57	N	2	2	22	85	25.9 (17-36.5)	
Rulin M, USA, English, 1993	18	Mean 28	These group of surveyed women formed the control group for sterilised women and were nonsterilised women in natural cycles; mean parity 2.56, 57.7% black, 23.5% Hispanic, 18.2% white	Non cyclical pelvic pain over 3 years excluding dysmenorrh oea and dyspareunia	Questionnaire (v)	78	Y	1	3	13	319	4.1 (2.2-6.9)	Prospect ive. 16% one year post sterilizat ion versus

													11.6% pre-operatively
Bang RA, India, English, 1989	Not stated	Over 13, mean 32.1	Survey conducted in Gadchiroli district of Maharashtra, India in two villages; all females over age 13 years were invited to participate; 25% of the non participating sample surveyed and found to be similar to study sample	Lower abdominal pain of undefined duration	Interview + examination (v)	59	Y	2	2	86	650	13.2 (10.7-16)	
Iglesias, Mexico, English, 1980	Not stated	Not stated	Medical service of the company polled at random airline stewardesses at the time they applied for assistance of a variety of clinical problems, personnel using contraception or suffering from obvious general or gynaecological problems were excluded	Current pelvic pain or congestion after long flights	Questionnaire (nv)	100	N	2	1	76	200	38 (31.2-41.1)	
Gurel, Turkey, English, 1998	6	18 to 56	In Jan-June 1995, women with various gynaecological complaints admitted in the dept. were included in the study. All were married and 14 were nulliparous. Those having previous pelvic surgery including caesarean section, those with pelvic mass, uterine anomaly, pregnancy or intrauterine device were excluded	Noncyclic pelvic pain for 6 months or longer influencing daily life or requiring analgesia	Questionnaire (nv)	Not stated	N	2	1	189	235	80 (74.8-85.3)	
Frljak, Bosnia, English, 1997	12	20 to 40	Information from of gynaecological consultations in 4 different periods during 1993/94 on women attending women's Therapy Centre, Zenica, Bosnia in the war period	Pelvic pain undefined	Hospital records (v)	Not stated	N	1	2	55	486	11.3 (8.6-14.5)	
Mahmood, UK, English, 1991	Not stated	Reproductive age	Subjects were patients consecutively attending Aberdeen Royal Infirmary who were to have laparoscopy for sterilisation, infertility, chronic	Noncyclical pelvic pain (current) of undefined duration	Questionnaire (nv)	99	N	1	1	391	910	43 (39.6-46.1)	

			abdominal or pelvic pain and abdominal hysterectomy for dysfunctional uterine bleeding- data given here is on women having laparoscopy for infertility or sterilisation										
Walker, USA, English, 1991	1	18 or over	In March 1989, attenders at Women's clinic (operated by dept. of O&G) and Family medical centre (university based primary care clinic) were consecutively approached; patients were racially and ethnically diverse and approximately 20-30% are assisted by public assistance programmes; mean age of patients at Family medical centre more at 37.4+/-16.1yrs vs. 32.1+/-11.2 years, no other significant differences of clinical relevance	Chronic or intermittent pelvic pain undefined- lower abdominal pain, that is, pain in any part of belly from navel down to private parts (lifetime or current)	Questionnaire (nv)	95	N	1	1	247	651	38 (35.8-43.6)	
Heisterberg, Denmark, English, 1986	Not stated	Reproductive age	The patients included in the present study comprised of consecutive women who had participated in a clinical controlled trial in 1978-79 on prophylactic antibiotics and development of postabortal PID. Before the abortion, information about previous births, spontaneous and induced abortions, episodes of PID, and the occurrence of CPP were obtained	Chronic pelvic pain (CPP) excluding dysmenorrhoea and dyspareunia of undefined duration	Questionnaire (nv)	77	N	1	1	22	352	6.2 (3.9-9.3)	CPP rate for those with postabortal PID was 4/29 (13.8%)

*Country resource-1: developed; 2-less developed; 3-least developed

+ v-validated; nv- not validated

Appendix 2.6: Metaregression to explore heterogeneity in the systematic review on prevalence of chronic pelvic pain

Reasons for heterogeneity	Dysmenorrhea (n=101) Coefficient (P value)	Dyspareunia (n=54) Coefficient (P value)	Noncyclical pain (n=17) Coefficient (P value)
Univariate analysis			
Development status of country	-0.184 (0.187)	0.203 (0.462)	0.127 (0.767)
Age group*	-0.133 (0.154)	-0.210 (0.285)	-
Representative sample	-0.181 (0.893)	*-0.559 (0.016)*	-0.144 (0.362)
Quality items			
Prospective design	-0.116 (0.594)	0.125 (0.766)	-1.571 (0.07)
Validated measurement tool	*0.305 (0.013)*	-0.245 (0.312)	-0.526 (0.209)
Adequate sampling method	-0.414 (0.758)	-0.173 (0.558)	-0.101 (0.858)
Sample size estimation	0.255 (0.480)	0.177 (0.584)	-0.573 (0.292)
Response rate > 80%	0.105 (0.424)	0.435 (0.076)	0.471 (0.309)
Quality score out of 5	0.090 (0.159)	0.041 (0.720)	-0.213 (0.329)
Quality score > 2/5	0.282 (0.099)	0.135 (0.632)	-0.345 (0.194)
Multivariate analysis			
Development status of country	-0.213 (0.160)	0.235 (0.422)	0.101 (0.816)
Age group*	-0.075 (0.499)	-0.214 (0.289)	-

Representative sample	-0.115 (0.429)	*-0.756 (0.007)*	-0.394 (0.376)
Quality items			
Prospective design	-0.117 (0.622)	0.212 (0.611)	-0.696 (0.549)
Validated measurement tool	0.267 (0.062)	-0.245 (0.312)	-0.589 (0.355)
Adequate sampling method	-0.058 (0.712)	0.140 (0.681)	-0.140 (0.868)
Sample size estimation	0.169 (0.662)	0.548 (0.113)	-0.453 (0.623)
Response rate > 80%	0.123 (0.422)	0.343 (0.166)	0.069 (0.886)
Quality score out of 5	0.108 (0.164)	0.204 (0.09)	-0.469 (0.050)
Quality score > 2/5+	0.244 (0.200)	0.503 (0.081)	*-0.901 (0.023)*

Appendix 2.7: Compliance of systematic review on the worldwide prevalence of chronic pelvic pain with The MOOSE Checklist

- A Proposed Reporting Checklist for Authors, Editors, and Reviewers of Meta-analyses of Observational Studies

Item	Complied	Section
Reporting of background should include		
Problem definition	Yes	Context
Hypothesis statement	Yes	Section 3, 4
Description of study outcome(s)	Yes	Study selection
Type of exposure or intervention used	No	N/A
Type of study designs used	Yes	Study selection
Study population	Yes	Study selection
Reporting of search strategy should include		
Qualifications of searchers (e.g. librarians and investigators)	Yes	Acknowledgements
Search strategy, including time period included in the synthesis and keywords	Yes	Data sources
Effort to include all available studies, including contact with authors	Yes	Data sources
Databases and registries searched	Yes	Data sources
Search software used, name and version, including special features used (e.g. explosion)	Yes	Appendix 2
Use of hand searching (e.g. reference lists of obtained articles)	Yes	Data sources
List of citations located and those excluded, including justification	Yes	Figure 1, Appendix 4
Method of addressing articles published in languages other than English	Yes	Data extraction
Method of handling abstracts and unpublished studies	No	Not encountered
Description of any contact with authors	Yes	Data sources
Reporting of methods should include		

Description of relevance or appropriateness of studies assembled for assessing the hypothesis to be tested	Yes	
Rationale for the selection and coding of data (e.g. sound clinical principles or convenience)	Yes	Data extraction
Documentation of how data were classified and coded (e.g. multiple raters, blinding, and interrater reliability)	Yes	Data extraction
Assessment of confounding (e.g. comparability of cases and controls in studies where appropriate)	Yes	Data synthesis
Assessment of study quality, including blinding of quality assessors; stratification or regression on possible predictors of study results	Yes	Results
Assessment of heterogeneity	Yes	Results on dysmenorrhoea, dyspareunia and noncyclical pain, table 2
Description of statistical methods (e.g. complete description of fixed or random effects models, justification of whether the chosen models account for predictors of study results, dose-response models, or cumulative meta-analysis) in sufficient detail to be replicated	Yes	Data synthesis
Provision of appropriate tables and graphics	No	
Reporting of results should include		
Graphic summarising individual study estimates and overall estimate	Yes	Figure 3-6, Results
Table giving descriptive information for each study included	Yes	Table 1
Results of sensitivity testing (e.g. subgroup analysis)	Yes	Results
Indication of statistical uncertainty of findings	Yes	Results
Reporting of discussion should include		
Quantitative assessment of bias (e.g. publication bias)	Yes	Results
Justification for exclusion (e.g. exclusion of non–English-language citations)	Yes	Figure 1
Assessment of quality of included studies	Yes	Figure 2, Conclusion

Reporting of conclusions should include		
Consideration of alternative explanations for observed results	Yes	Conclusion
Generalisation of the conclusions (i.e. appropriate for the data presented and within the domain of the literature review)	Yes	Conclusion
Guidelines for future research	Yes	Conclusion
Disclosure of funding source	Yes	Funding source

Appendix 3: Supplementary data for Chapter 3: Systematic review of risk factors in chronic pelvic pain

Appendix 3.1: Embase search strategy for systematic review on risk factors in chronic pelvic pain

1. exp dysmenorrhea/ or exp dyspareunia/ or exp pelvis pain syndrome/
2. (dysmenorrhea or dysmenorrhoea).mp. [mp=title, abstract, subject headings, drug trade name, original title, device manufacturer, drug manufacturer name]
3. (pain$ adj3 menstruation).mp. [mp=title, abstract, subject headings, drug trade name, original title, device manufacturer, drug manufacturer name]
4. (pain$ adj3 menses).mp. [mp=title, abstract, subject headings, drug trade name, original title, device manufacturer, drug manufacturer name]
5. (pain$ adj3 menstrual).mp. [mp=title, abstract, subject headings, drug trade name, original title, device manufacturer, drug manufacturer name]
6. exp PAIN/
7. (menstrua$ or menses).mp. and 6 [mp=title, abstract, subject headings, drug trade name, original title, device manufacturer, drug manufacturer name]
8. period pain.mp. [mp=title, abstract, subject headings, drug trade name, original title, device manufacturer, drug manufacturer name]
9. painful periods.mp. [mp=title, abstract, subject headings, drug trade name, original title, device manufacturer, drug manufacturer name]
10. dyspareunia.mp. [mp=title, abstract, subject headings, drug trade name, original title, device manufacturer, drug manufacturer name]
11. (pain$ adj3 (intercourse or coitus or coital)).mp. [mp=title, abstract, subject headings, drug trade name, original title, device manufacturer, drug manufacturer name]
12. exp COITUS/

13. (12 or sexual intercourse.mp.) and 6 [mp=title, abstract, subject headings, drug trade name, original title, device manufacturer, drug manufacturer name]
14. pelvic pain.mp. [mp=title, abstract, subject headings, drug trade name, original title, device manufacturer, drug manufacturer name]
15. (pelvic or pelvis).mp. and 6 [mp=title, abstract, subject headings, drug trade name, original title, device manufacturer, drug manufacturer name]
16. 1 or 2 or 3 or 4 or 5 or 7 or 8 or 9 or 10 or 11 or 13 or 14 or 15
17. limit 16 to male
18. exp *Neoplasm/
19. 16 not (17 or 18)
20. exp COHORT ANALYSIS/ or cohort.mp. or Epidemiology/
21. exp RISK/ or risk.mp.
22. risks.mp.
23. (odds adj3 ratio$).mp. [mp=title, abstract, subject headings, drug trade name, original title, device manufacturer, drug manufacturer name]
24. (relative adj risk$).mp. [mp=title, abstract, subject headings, drug trade name, original title, device manufacturer, drug manufacturer name]
25. case control$.mp. [mp=title, abstract, subject headings, drug trade name, original title, device manufacturer, drug manufacturer name]
26. (causality or causation or causal).mp. [mp=title, abstract, subject headings, drug trade name, original title, device manufacturer, drug manufacturer name]
27. exp Case Control Study/ or exp Risk Factor/
28. 20 or 21 or 22 or 23 or 24 or 25 or 26 or 27
29. 19 and 28
30. exp Pelvis Pain Syndrome/ep, et [Epidemiology, Etiology]
31. 30 not (17 or 18)
32. 29 or 31

Appendix 3.2: Medline search strategy

1. exp Pelvic Pain/ or pelvic pain.mp.

2. ((low$ adj3 abdom$) and pain$).mp. [mp=title, abstract, cas registry/ec number word, mesh subject heading]

3. exp Abdominal Pain/

4. exp PAIN/

5. (pelvic or pelvis).mp. [mp=title, abstract, cas registry/ec number word, mesh subject heading]

6. 4 and 5

7. limit 6 to female

8. limit 3 to female

9. dysmenorrhoea.mp.

10. dysmenorrhea.mp. [mp=title, abstract, cas registry/ec number word, mesh subject heading]

11. (pain$ adj3 menstruation).mp. [mp=title, abstract, cas registry/ec number word, mesh subject heading]

12. (pain$ adj3 menses).mp. [mp=title, abstract, cas registry/ec number word, mesh subject heading]

13. (pain$ adj3 menstrual).mp. [mp=title, abstract, cas registry/ec number word, mesh subject heading]

14. (menstrua$ or menses).mp. and 4 [mp=title, abstract, cas registry/ec number word, mesh subject heading]

15. period pain.mp. [mp=title, abstract, cas registry/ec number word, mesh subject heading]

16. limit 15 to female

17. painful periods.mp. [mp=title, abstract, cas registry/ec number word, mesh subject heading]

18. exp Dyspareunia/

19. dyspareunia.mp. [mp=title, abstract, cas registry/ec number word, mesh subject heading]

20. (pain$ adj3 intercourse).mp. [mp=title, abstract, cas registry/ec number word, mesh subject heading]

21. (pain adj3 coitus).mp. [mp=title, abstract, cas registry/ec number word, mesh subject heading]

22. (pain$ adj3 (coitus or coital)).mp. [mp=title, abstract, cas registry/ec number word, mesh subject heading]

23. exp Coitus/ or sexual intercourse.mp.

24. 23 and 4

25. exp Cohort Studies/

26. cohort.mp. [mp=title, abstract, cas registry/ec number word, mesh subject heading]

27. exp RISK/

28. (risk or risks).mp. [mp=title, abstract, cas registry/ec number word, mesh subject heading]

29. (odds and ratio$).mp. [mp=title, abstract, cas registry/ec number word, mesh subject heading]

30. (relative and risk$).mp. [mp=title, abstract, cas registry/ec number word, mesh subject heading]

31. (case adj3 control$).mp. [mp=title, abstract, cas registry/ec number word, mesh subject heading]

32. exp Causality/

33. (causation or causal).mp. [mp=title, abstract, cas registry/ec number word, mesh subject heading]

34. exp Case-Control Studies/ or exp Risk Factors/ or exp Odds Ratio/

35. 1 or 2 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 16 or 17 or 18 or 19 or 20 or 21 or 22 or 24

36. 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 34

37. 35 and 36

38. exp *Neoplasms/

39. 37 not 38

40. limit 39 to male

41. 39 not 40

42. from 41 keep 1-1607

43. from 42 keep 1-1607

44. exp Pelvic Pain/ep, et [Epidemiology, Etiology]

45. 44 not 38

46. limit 45 to female

47. 46 not 43

Appendix 3.3: CPP aetiology systematic review data extraction form

Reviewer

Study number

Authors

Year

Country

Language

Does this paper have any patients with pelvic pain (exclude if acute pelvic pain)
Yes/ no
If no, then exclude the paper from the review

If yes, then- is there a comparative group without chronic pelvic pain- yes/ no
If no, then exclude the paper from the review

Definition of case
Definition of control
Location/setting
Year

Duration
Age range
Population characteristics- e.g. age, ethnicity, parity, education, acceptance rate etc.

Validity Assessment

Prospective / Retrospective

Study design- Cohort/ before after/cross-sectional/ case-control.

Recruitment of cases - consecutive/random/other/not defined

Recruitment of controls- consecutive/random/other/not defined

Control for confounding (e.g. Logistic regression model/ adjusted analysis):
Yes / no

For case/control study: Matching done: Yes / no

List of factors adjusted for:

In your judgement, was the method of ascertainment of risk factor(s) validated- yes/ no / undefined

Did the risk factor precede outcome- yes/ no / undefined

Follow up (months) after exposure of the factor - 3/ 6 / undefined / not applicable

Method for ascertainment of outcome -yes/ no/ not defined / not applicable
If yes, details-

Exposure assessment similar- was exposure to the aetiological factor assessed in the same way for cases and controls? Yes/no

Follow up- >95% 90-95% 85-90% 80-85% <80%

Data extraction

Total sample

Age
Risk factor studied
1
2
3
4
5
6

Follow up (no. of months)

No. with CPP vs. nos. without CPP

Type of cases: Dysmenorrhoea Dyspareunia Acyclical CPP

Type of controls:

Women without pain
Women with other pain e.g. headache/backache
Others-

Risk factor studied:

1

	CPP positive	**CPP negative**	**Total**
No. exposed			
No. not exposed			
Total			

2

	CPP positive	**CPP negative**	**Total**
No. exposed			
No. not exposed			
Total			

3

	CPP positive	**CPP negative**	**Total**
No. exposed			
No. not exposed			
Total			

4

	CPP positive	**CPP negative**	**Total**
No. exposed			

No. not exposed			
Total			

5

	CPP positive	**CPP negative**	**Total**
No. exposed			
No. not exposed			
Total			

6

	Mean	**Std.deviation**	**Total**
CPP+			
CPP-			
Total			

If 2X2 table not possible:

Reported OR/RR (unadjusted)

Association (adjusted)/ p value

Comments

Appendix 3.4: List of included studies for the systematic review of risk factors in Chronic Pelvic Pain

Dysmenorrhoea: [1-63]
Dyspareunia: [3;21;38;41;64-78]
Noncyclical CPP: [21;22;35;41;66;68;70;79-111]

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Appendix 3.5: Table of characteristics of studies included in systematic review of risk factors in dysmenorrhoea

No.	Author(s), country, language and year	Number of women analysed (Cases versus controls)	Population characteristics and response rate where stated	Risk factors studied	Definition of case	Definition of control	Follow-up (mo) After exposure
1.	Pawloski, Mexico, English, 2004	177 (50 vs.127)	Data was collected between Dec. 1999-Feb.2000 on entire community of one Mayan village, women over age 45 and those who had delivered in the last 9 months were excluded, 79 women were of Mayan ancestry, 67 were half Mayan and 31 women had no Mayan ancestry, general prevalence of dysmenorrhoea was 28%, 61% response rate	Number of pregnancies Age at menarche Age at birth of first child BMI	Pain during menses sometimes or often	No pain during menses	Undefined
2.	Harlow BL, USA, English, 2002	976	36-44 year old study population derived from a population based cross sectional sample from seven Boston metropolitan area communities, 72% follow up	Tubal sterilisation	Menstrual pain-mild (seldom requiring medication), moderate (usually require medication) and severe (both medication and bed rest required)	No menstrual pain	Not reported

3.	Hirata, Japan, Japanese, 2002	2703	18-22 years old college students studying at Osaka international university were invited to participate, >95% response rate	Low Body mass index (BMI) High BMI	Dysmenorrhoea always, undefined	No dysmenorrhoea or rarely	Undefined
4.	Runtz, Canada, English, 2002	770	17-56 (median age 18 years) years old women enrolled in psychology at a medium size western Canadian university who volunteered for a study of women's health concerns were eligible to participate, 93% single, 89% in the first or second year of university, of European descent (85%), 51% identified social sciences or education as their field of study, 77% raised by both biological parents in intact families	Childhood abuse	Undefined	Pain free	No details of laparoscopy available
5.	Walraven Gambia, English, 2002	607(85vs. 522)	20 villages were randomly selected for inclusion in the study, no specific exclusion criteria, 72% response rate 15-54 year old women	Nulliparity Age <25 years	Pain with menstrual periods that prevents normal activities in the last 3 months	None or mild pain during menses	Undefined
6.	Yang JM, China, English, 2002	690 (91 vs. 599)	A epidemiological study was conducted on18-44 years old non hysterectomised, 296 non pregnant female workers exposed to mercury vapour and 394 female workers from food processing plants working for at least 1 year and experiencing regular menstrual cycles, women	Exposure to metallic mercury vapour	Serious menstrual pain that affected work or required medication to relieve symptom before or during menstrual cycle	No dysmenorrhoea	Undefined

			using OC, IUD or steroid hormones were excluded				
7.	Alonso C, USA, English, 2001	184	Participants represented 19% of the total college students who were enrolled in the Introduction to Psychology classes at the university of Wisconsin-Madison and 52 (28.2%) took OCs, informed consent was taken and all procedures were approved by the Institutional Review committee, >95% response rate	Social support Anxiety or depression	Dysmenorrhoea undefined	No pain during menses	Undefined
8.	Dusek, Croatia, English, 2001	168	15-21 years old females, average age of athletes was 17.9+/-2.1 years vs. 17.0+/-1.1 years, female athletes from three Zagreb sports clubs as well as ballet dancers from the School of Classical Ballet in Zagreb, the group comprised of 34 runners, 10 volleyball players, 18 basketball players and 10 ballet dancers, control group comprised of 96 high school girls from the school of Textile Design in Zagreb none of who took part in any physical recreation or sports activity, none of the study subjects used oral contraception	Athletic activity	Painful menstruation undefined	No pain during menses	Not stated
9.	El-Defrawi, Egypt, English, 2001	250 (189 vs. 61)	Age not defined, patients of maternal and childhood centre, Islamia, 87% acceptance and >95% follow up	Circumcision	Undefined	No pain	Not stated

10.	Balbi C, Italy, English, 2000	347 (293 vs. 54)	14-21 years old students from a professional institute in Naples were included	Early menarche (<12 years) Duration of menses> 5 days Diet	Intensity, location, duration of period pain	No period pain	Not stated
11.	Chen C, China, English, 2000	165	25.9+/-2.3 vs. 26.1+/-2.6 years, Chinese newly wed non smoking women without dysmenorrhoea, average height 1.61m, weight 54 kg, BMI 20.8 and age at menarche14 years, from Shenyang province in China, not using contraception and intending to get pregnant, 90-95% follow up	Environmental tobacco exposure (ETS) at home	Diary recording of abdominal or low back pain for at least 2 days during menstrual period	No pain during menstruation	4 months
12.	Gordley, USA, English, 2000	170	Women employees aged 18-41 (mean 29.4) years, both military and civilian from 10 air force bases were recruited, 60.3% acceptance rate, mean BMI 25.2, 56.8% married or with permanent partner, 8.2% smokers, 82.4% were in military service and 71% worked exclusively during the day	Job strain Life events Caucasian race Fuel exposure/handling Passive smoking	Pain during or just before periods requiring lying down or medications or missing work	No disabling pain during periods	Not stated
13.	Visvanathan, USA, English, 2000	516	Part of detailed baseline study of the health status of college alumnae, half of whom were college athletes and half non-athletic classmates, 516 of these were eligible for inclusion in this	Tubal ligation	Painful periods undefined	No pain during periods	Not stated

			study as they were aged 15-44 years and had had at least one pregnancy at the time of reporting				
14.	Mishra, 2000, English, Australia	14779	Study population were women aged 18-23 years who participated in the baseline survey of the Australian Longitudinal Study on Women's Health conducted in 1996, registered on the national Medicare database, oversampling from rural and remote areas	Smoking OCP use more than 1 year Parity>2 High alcohol consumption 11-13 years of education Married/de facto Low BMI (<17) High exercise	Severe period pain sometimes or often	Period pains never or rarely	Not stated
15.	Wu D et al, China, English, 2000	435 (129 vs. 306)	Age not stated, women who were non smokers, non drinkers, no physician diagnosed organic diseases were included	CYP2D6 polymorphism Glutathione S transferase mutation	Women with pelvic or lower abdominal pain associated with menses	Women without period pains	Not stated
16.	Holmlund, Sweden, English, 1999	66 (33 vs. 33)	Age 25 years, the subjects belonged to a cohort of 349 schoolgirls who participated in a longitudinal study of personality traits, no intergroup differences in civil status, length of education and experience of upbringing were found	Somatization Depression Anxiety Gravidity Abortion or miscarriage	Severe dysmenorrhoea, undefined	Pain free	Not reported
17.	Kritz S, USA, English, 1999	2912	Mean age 26 years, all women serving aboard navy ships were eligible, the study was part of the Women Aboard Navy ships Comprehensive Health and Readiness Research Project, 58%	Smoking Alcohol use	Pain during periods requiring medication or time off work	Pain free	Not reported

			white, 32% black and 10% were other racial groups, overall mean response 52.2%				
18.	Golding, USA, English, 1998	4094	3 cross-sectional surveys: North Carolina Epidemiologic Catchment Area study –Mean age 43.9 +/- 0.7 years, 38.2% African American, 60.3% European American, 1.4% other groups, 11.8 years mean education, sample selected to represent adults in 2 mental catchment areas in North Carolina, Durham county and 4 other rural counties, 79% acceptance and 94% follow up rate Los Angeles Epidemiological Catchment Area study- 44.4% Latin, 44.2% European American and 11.4% other groups, mean education11.5 years, Latino residents were interviewed in English or Spanish according to their preference, National Study of Health and Life Experiences of Women (NSHLEW) participants- Mean age 46.1 +/- 0.8 years, gave informed consent, 9.7% African American, 84.3% European American and 6% other groups with mean education 12.8 years and age>/=21 years, 76% acceptance and 91% follow up	Sexual assault	Excessively painful menstrual periods	No menstrual pain	Not stated, numbers who had laparoscopy not stated

			rate				
19.	Di Cintio, Italy, English, 1997	251(106 vs. 145)	Median age 26 vs. 27 years, southern European, normal gynaecological examination, ultrasound and CA 125, all subjects recruited from the same outpatient service, 97% acceptance rate	Sport activities Smoking, Age at menarche Irregular menstrual cycles Duration and heaviness of menstrual flow Parity >/=2 Induced abortion>/=1 Missed miscarriages>/=1 Dietary intake of 1 or >/=2 egg per week	Dysmenorrhoea grade 2-3 on Andersh-Milsom scale	Women without dysmenorrhoea	
20.	Elahi N, Pakistan, English, 1997	696 (529 vs. 167)	12-18 year old Muslim girls from schools/college of Multan city	Age Hobbies	Dysmenorrhoea categorised by severity	No dysmenorrhoea on this scale	
21.	Hornsby, USA, English, 1997	358	37-39 years old participants were part of larger study of health effects of prenatal exposure to DES, women whose mothers had participated, while pregnant with them, in RCT of DES from 1950-52 were traced and interviewed in 1990, 83% acceptance rate	Smoking	Pain with menses	No menstrual pain	6 months
22.	Jamieson DJ, USA, English, 1997	581	18-45 year old women in waiting areas of five primary practices in North Carolina were approached, 83% response rate	Sexual abuse Low income	Pain often/always during menses	No pain in lower abdomen during menses	Undefined, number of women who were investigated undefined

23.	Harlow S, USA, English, 1996	165	17-19 years, nulliparous women starting college, not on oral contraceptive pills or intrauterine device, 31.8% acceptance rate	Menstrual cycle length Prolonged menstrual bleed (>7 days) Age at menarche Alcohol Smoker Living away from home Overweight	Pain episodes occurring 5 days prior to or during the bleed episode (data compared for no vs. severe or grade 3 dysmenorrhoea)	Women with no pain during periods	12
24.	Hewison A, UK, English, 1996	70 (47 vs. 23)	18-26 years old nursing undergraduates were asked to participate in the study, 29% used oral contraceptive pills and 54 subjects had regular periods, 56.5% response rate	Oral contraceptives Smoking Length of menstrual cycle Duration of menses	Dysmenorrhoea undefined	No dysmenorrhoea	Undefined
25.	Montero, Spain, English, 1996	1146	14-20 years old girls attending secondary schools in the municipality of Alcobendas, on the outskirts of Madrid were interviewed	Chronological age Menarche age <10 years Slimming with strong or medium BMI Diet	Dysmenorrhoea divided into mild, moderate and severe type but undefined	No dysmenorrhoea	Undefined
26.	Skierska, Poland, Polish, 1996	734 (415 vs. 319)	15-36 years, mean age 22.04+/-4.6years, cohort from Warsaw, 5.3% with university education, 48.6% with secondary education, average height 165.5 cm, average BMI 20.9+/-2.5, mean age at menarche 12.9 years	Nulligravidity Gynaecological age <5.25 years Premenstrual syndrome High physical activity	Strong cramp in suprapubic region or lower back just before or with menses needing analgesia	No dysmenorrhoea	Undefined
27.	Christiani, USA, English, 1995	895	20-40 years old (mean age 28.4 years), non alcohol, never smoking female textile workers employed in three cotton mills in Anhui province, China, 92% acceptance rate	Occupational stress	Abdominal/pelvic pain during menses	No dysmenorrhoea	

28.	Deutch B, Denmark, English, 1995	181(44 vs. 137)	20-45 years old healthy, nonpregnant women, not using contraceptive or other hormone pills, 65% married, 45% parous, 27% students, 67% with completed professional training and 6% unskilled	Daily average intake of various nutrients	Menstrual pain undefined	No menstrual pain	4 days
29.	Jarrett, USA, English, 1995	61 (27 vs.34)	21-44 years old participants were screened to determine that they were currently menstruating regularly without using birth control pills or an IUD and had no history of gynaecological or GI surgery/pathology or renal pathology, 83% were white and 64% had college degree, 78% response rate	Ever smoker PMS Alcohol 3 times/week	Severity rating for uterine cramping pain during the first 3 days of menstrual flow	No/mild uterine cramps	Undefined
30.	Waller, UK, English, 1995	117 (48 vs. 69)	Mean 35+/-4.9, 31+/-4.1, 30.9+/-7.5, 30.6+/-7.6 in the 4 groups: women admitted for laparoscopy for pelvic pain, infertility or sterilisation at Royal Free hospital, London or University college hospital, Cardiff were recruited, similar as regards age at coitarche, lifetime number of sexual partners and total Golombok Rust Inventory of sexual satisfaction (GRISS), divided into 4 groups: Group 1(n=38) control group of sterilisation patients with normal pelvis, Group 2 (n=31) c/o	Depression Anxiety Nonsensuality Vaginismus	Dysmenorrhoea, dyspareunia or pelvic pain with normal pelvis or minimal-mild endometriosis	No pain, C/O infertility with minimal-mild endometriosis on laparoscopy	Undefined

			infertility with minimal to mild endometriosis on laparoscopy, Group 3 (n=18) c/o dysmenorrhoea, dyspareunia or pelvic pain with minimal-mild endometriosis on laparoscopy and Group 4 (n=30) pelvic pain with normal pelvis at laparoscopy				
31.	Parazzini F, Italy, English 1994	251(106 vs. 145)	15-40 years old women with median age 27 years, attending gynaecology outpatient clinic in Milan, women who reported no gynaecological pathology were included as controls, 95% acceptance rate and >95% follow up rate	Smoking Alcohol	Women with moderate or severe primary dysmenorrhoea (Andersch Milsolm scale) with normal examination, negative TVS and normal CA 125	Women with no dysmenorrhoea	
32.	Freeman, USA, English, 1993	165 (26 and 39 vs. 100)	15-19 year old 165 nulliparous adolescents who completed a 2 year longitudinal study of teenage pregnancy were used in this analysis with their consent	Premenstrual symptoms Ongoing symptoms	Moderate to severe dysmenorrhoea (score 3-6)	No dysmenorrhoea	24 months
33.	Gomibuchi, Japan, English, 1993,	58 (51vs. 7)	All women with endometriosis verified by laparoscopy or laparotomy, normal menstrual cycles	Extraggression trait	Undefined	No dysmenorrhoea	Undefined
34.	Heisterberg, Denmark, English, 1993	1229	14-45 years old pregnant women referred to the O&G department, university of Copenhagen for delivery or induced first trimester abortion, >95% follow up	Previous pelvic inflammatory disease (PID) Age	Undefined	No dysmenorrhoea	Undefined

35.	Messing K, France, English, 1993	726	Women aged <25->40 years, working in 17 poultry slaughterhouses and 6 canning factories in western France employed on 1/1/87	Feeling very cold Uncomfortably drafty or humid Effort exerted, either arm Unable to leave position freely at work Cannery worker Age<25 years^ Smoking Oral contraceptives (OC) Nulliparity 3 or fewer breaks/day Irregular beginning of work day Work always needs full attention	Lower abdominal pain just before and/or during period	Women with no pain just before or during periods	
36.	Rulin MC, USA, English, 1993,	966 (121 vs. 698)	Mean 28 vs. 27 years, low income, ethnically and regionally diverse 500women from three participating institutions who underwent sterilisation 3-4.5 years earlier answered the questionnaire, modified Pomeroy technique used for puerperal sterilisation, interval sterilisation was done by Falope bands or bipolar electrocautery, women taking OC (147) in the control group were excluded from analysis leaving 319 women as third and purer control group, 78% follow up,	Sterilisation	Bad menstrual cramps	No menstrual pain	3-4.5 yrs
37.	Ng, Singapore, English, 1992	415	From a sampling frame of all housing development board flats	Age<30 Menarche <12 years	One or more episodes of menstrual cramp or pain	No episode of menstrual pain	Undefined

			in Clementi town, a two stage cluster sampling was used to draw a random sample of 480 households with 15-54 years old women, 30.3% Chinese, 28.8% Malay, 30.6% Indian, 36.8% married, 30.7% employed, 72% individual response rate	Nulliparity Physical activity Smoking Oral contraceptives	in the previous year not due to diagnosed gynaecological disease		
38.	Izzo A, Italy, English, 1991	483 (357 vs.126)	16-23 years old women from various schools in Campania belonging to the same race and socio-cultural background	Sport activities before menarche Habitual smoking	Pain which precedes by a few hours or accompanies menstrual flow	Women with no pain during periods	Not stated
39.	Lee, USA, English, 1991	594 (321 vs. 273)	Data from a larger study of 21-50 years old women working as nurses in seven hospitals on the west coast. Excluded subjects were over 50 years of age, not menstruating, or had been pregnant or lactating during the six months prior to completing the questionnaire between October 87-june 1988, each worked 32-55 hours per week, 86.1% Caucasian, 58.3% married or partnered, 53.5% had been pregnant and 65.8% had no living children at home, 69% response rate	Nulliparity Duration of menses Heavy menstrual blood loss Caucasian race OC use	Cramps just before or at the start of menstrual period	No menstrual pain	Undefined
40.	Robinson J, USA, English, 1991	308	</=18yrs, unmarried, not pregnant, wishing contraception, 77% black inner city population, 72% acceptance rate and 87% follow up rate	Consistent OC pill use Smoking Alcohol	Dysmenorrhoea on Andersh-Milsom scale	No severe dysmenorrhoea on this scale	6

41.	Bukman, Netherlands, English, 1990	76 (37 vs.39)	30.1+/- 4.2 vs. 34.2+/- 5.1 years, 50 women with infertility of 1 year, having regular menstrual cycles and ovulation and visiting infertility clinic. Control group from general practice not wishing to get pregnant and not using oral contraceptives or intrauterine devices, acceptance rate 72.5 vs. 50%	Involuntary infertility	Low abdominal pain some hours prior to and during menstruation	No dysmenorrhoea	Undefined
42.	Holmlund U, Sweden, English, 1990	349	All girls attending a classroom session in 1973 in 8th grade in the city of Norrkoping, a medium size Swedish city were interviewed initially. They were born in 1958-59. In 1983, after exclusion of incomplete questionnaires and impossibility of tracing current addresses, the subjects were contacted and asked to fill in and return the questionnaires, 73% follow up rate	Neurotic self-assertiveness Feminity	Dysmenorrhoea undefined	No dysmenorrhoea	Undefined
43.	Okonfua, Nigeria English, 1990	133	20.23+/-2.5 vs. 21.86+/-2.79 years old women athletes participating in the bi-annual interuniversity games held at university of Abadan, Nigeria in April 1986 were approached, subjects' age weight, height ranged between 16-28 years, 42 and 83 kg and 51 and 75 inches respectively, noncontact sports	Contact sports activity	Undefined	No dysmenorrhoea	Undefined

			athletes were younger, lighter and leaner than contact sports athletes				
44.	Sundell G, Sweden, English, 1990	489	1 in 4 women from population register who were residents in city of Gothemberg who had participated in epidemiological study of dysmenorrhoea at the age of 19 years were invited, 91% acceptance rate and 83% follow up rate	Parity Oral Contraceptives Intrauterine device Menarcheal age BMI Duration of menstrual flow Length of the cycle Smoking Physical exercise Parity Abortion or miscarriage	Mild, moderate or severe dysmenorrhoea on verbal multidimensional scoring system	No pain during periods	Undefined
45.	Fisher, USA, English, 1989	207	The survey was administered to 16-18 years old female patients and friends (mean age 17.6 years) in the waiting room of the Five Towns Adolescent Health Service, a general health facility for teenagers located in a middle to upper-middle class suburb of New York City between Sep 1985-May 1986, predominantly white (86%), most were catholic (55%) or Jewish (32%), 59% were in high school	Premenstrual symptoms	Mild, moderate or severe dysmenorrhoea	No pain during periods	Undefined
46.	Stambolov, Bulgaria, Bulgarian, 1989	324	18-39 yrs vs. 19-41 yrs, women hospitalised in medical institute, Pleven, Bulgaria with a diagnosis of adnexitis between 1979-1984 and 1985-86, controls were	PID	Undefined	No dysmenorrhoea	1-6 years

			healthy fertile women				
47.	Teperi J, Finland, English, 1989	3370	12-18 years, all girls born on consecutive days in July 1964, 66,68,70 derived from national population registry, 87% acceptance rate and 80-90% follow up rate	Gynaecological age Duration of menses Physical condition Alcohol Briskness in the morning	Menstrual pain needing medication or absenteeism from work	No menstrual pain	Not stated
48.	Brown S, UK, English, 1988	2092	18-49 years old women experiencing menstruation and registered with two GP practices in Milton Keynes were included, 22.5% < 24 years, 35.2% between 25-34 years, 33.8% 35-44 years, 8.5% 45-49 years, 30.1% nulliparous, 52.5% Para 1, 16.2% Para 2 and 1.2% Para 5 or more, 48.1% never smokers, 35.4% social class I-II, 13.7% social class IV-V, 74% acceptance rate	Smoking Oral Contraceptives Intrauterine device Tubal sterilisation	Painful periods in most months	Periods not painful	Not stated
49.	Pullon, New Zealand, English, 1988	1456 (772 vs. 684)	20-45 years old women surveyed, 80% of the women who were currently menstruating were included in the analysis, GP surgeries randomly selected in June 1985 and 76% of the surgeries approached participated	Length of the cycle, Smoking, Premenstrual syndrome, Occupation, Parity, Contraception	Pain with periods	No pain with periods	Undefined
50.	Shaver, USA, English, 1987	153 (55 vs. 98)	18-32 years old dysmenorrhoeic women were selected from those women who responded by phone to a university community advertisement, age matched non	Heavy menstrual flow Duration of menstrual flow Premenstrual symptoms	Dysmenorrhoea undefined	No dysmenorrhoea	Undefined

			dysmenorrhoeic women were randomly selected from a census listing for 5 neighbourhoods in a large south-eastern city, mean age 25.8+/-3.1 vs. 27.3+/-3.8 years, 90.9% Caucasian vs. 65% in non dysmenorrhoeic group, 60% vs. 80% were employed, 34.5 vs. 76.5% were protestant, 93% response rate				
51.	Whittle GC, UK, English, 1987	50 (25 vs. 25)	29.7+/-7.5 vs. 28.1+/-7.5 years old women attending a health centre in Manchester were asked to participate if they fulfilled following criteria: had regular menstrual cycles, were not on Oral Contraceptives, Caucasian origin, not on psychotropic medication and were not in premenstrual phase of their cycle when interviewed, the two groups were not significantly different in social class, marital status or parity	Nulliparity Somatisation Depression Overall support Negative support Positive support	Abdominal pain during menstruation occurring in the absence of pelvic pathology	No dysmenorrhoea	Not stated
52.	Toriola AL, Nigeria, English, 1986	1081	18-25 year old women between years 1984-85, athletes in various sports with at least 3 years experience of national level competitive sports, non-athletes selected from women attending secondary schools, colleges or universities in the same localities where the athletes trained	Athletic sports	Undefined	No dysmenorrhoea	Not stated

53.	Mergler D, Canada, English, 1985	318 (211vs. 107)	15-35 years old women working in 8 poultry houses and controls were full time housewives married to male slaughterhouse workers who were not pregnant, not menopausal, not amenorrhoeic or not undergone hysterectomy	Slaughterhouse worker Very cold working atmosphere	Lower abdominal pain during period	Women without lower abdominal pain during period	Undefined
54.	Wilson, USA, English, 1984	327	All new female students entering a large independent coeducational secondary school answered a questionnaire about their menstrual history as part of health record in 1980 and 1981, follow up questionnaires and menstrual calendars were obtained on 3 separate occasions, mean age 15.45+/- 1.11 years, mean age at menarche 12.57+/- 1.12 years, 72.5% with regular cycles, 250 boarders and 64 day students, 313 white and 14 black students, 52.5% had dysmenorrhoea, 87 girls responded to the follow up, no significant differences in place of residence, menstrual characteristics or hours of exercise per day between responders and non responders	Type and hours of exercise BMI Chronological age Gynaecologic age	Dysmenorrhoea divided into mild, moderate and severe type	No dysmenorrhoea	Not stated
55.	Andersch B, Sweden, English, 1982	596(431vs. 165)	All women born in 1962 aged 19 years at the time of the study, residing in Gothemberg city, 73% acceptance and follow up	OCs Early menarche Duration of menses Height, weight	Painful menstruation-mild, moderate or severe (Data compared for severe vs. no	Painless menstruation	Undefined

			rate	Parity Smoking Heredity	dysmenorrhoea)		
56.	Klein J, USA, English, 1981	2699 (1611 vs. 1088)	12-17 years, data from the national health examination survey cycle III collected between 1966-1970 by the National Centre for Health Statistics, >95% follow up rate	Chronological & gynaecological age Socio-economic status	Crampy lower abdominal pain occurring during menses	No dysmenorrhoea	Undefined
57.	Wood, Australia, English, 1979	2343	Data from 15-59 year old women attending Shepherd foundation for comprehensive health check	Country of birth Marriage Nulliparity Education Occupation Smoking Alcohol OCs Emotional difficulties Suicidal tendency	Undefined	No pain with periods	Undefined
58.	Malina R, USA, English, 1978	48	Subjects from university, college athletes, nonatheletes and Olympic basketball athletes, all except one white, >95% follow up	College athletics Olympic athletics	Undefined	No dysmenorrhoea	Not stated
59.	Wood, Australia, English, 1978	1180	Melbourne Metropolitan health and social survey, Victoria in 1971	Smoking Neuroticism Psychiatric diagnoses	Sufficient discomfort to disrupt life for one day during periods or to see a doctor or have medications prescribed	No discomfort enough to disrupt life during periods	Undefined
60.	Timonen, Finland, English, 1973	748	Sample was drawn by sending a questionnaire to one-tenth of the female students at the university of Helsinki and to female	Premenstrual symptoms	Menstrual pelvic pain	No pain during periods	Undefined

			students at the Institute of Physical Education, Jyvaskyla, 65% were 21-24 years old range: 18-28 years				
61.	Sehgal, India, English, 1971	384 (172 vs.212)	16-25 years old college girls of Banaras Hindu university residing in 3 hostels inside the university campus were interviewed, 82.3% were from urban areas and 91% were Hindus, 79.5% were below 21 years of age and 5.2% were married, 83% response rate	Exercise Heavy menstrual flow Premenstrual symptoms Psychological symptoms	Pain during menses categorised as mild, moderate or severe	No pain during menses	Undefined
62.	Widholm O, Finland, English, 1971	5399	10-20years old girls who had started menstruating and their mothers were included in the study	Physical constitution Gynaecological age Maternal dysmenorrhoea Social group	Pain with menstrual periods	No pain during periods	Undefined
63.	Hirt, USA, English, 1967	105	Subjects used in this study were freshman student nurses at a large metropolitan hospital, relatively homogenous in age and socio-economic status, all received physical examination	Anxiety Neuroticism	Cramps before or during menstruation	No pain during or before periods	Undefined

64.	Pawloski, Mexico, English, 2004	177 (50 vs.127)	Data was collected between Dec. 1999-Feb.2000 on entire community of one Mayan village, women over age 45 and those who had delivered in the last 9 months were excluded, 79 women were of Mayan ancestry, 67 were half Mayan and 31 women had no Mayan ancestry, general prevalence of dysmenorrhoea was 28%, 61% response rate	Number of pregnancies Age at menarche Age at birth of first child BMI	Pain during menses sometimes or often	No pain during menses	Undefined
65.	Harlow BL, USA, English, 2002	976	36-44 year old study population derived from a population based cross sectional sample from seven Boston metropolitan area communities, 72% follow up	Tubal sterilisation	Menstrual pain-mild (seldom requiring medication), moderate (usually require medication) and severe (both medication and bed rest required)	No menstrual pain	Not reported
66.	Hirata, Japan, Japanese, 2002	2703	18-22 years old college students studying at Osaka international university were invited to participate, >95% response rate	Low Body mass index (BMI) High BMI	Dysmenorrhoea always, undefined	No dysmenorrhoea or rarely	Undefined
67.	Runtz, Canada, English, 2002	770	17-56 (median age 18 years) years old women enrolled in psychology at a medium size western Canadian university who volunteered for a study of women's health concerns were eligible to participate, 93% single, 89% in the first or second year of university, of European descent (85%), 51% identified social sciences or education as	Childhood abuse	Undefined	Pain free	No details of laparoscopy available

			their field of study, 77% raised by both biological parents in intact families				
68.	Walraven, Gambia, English, 2002	607(85vs. 522)	20 villages were randomly selected for inclusion in the study, no specific exclusion criteria, 72% response rate 15-54 year old women	Nulliparity Age <25 years	Pain with menstrual periods that prevents normal activities in the last 3 months	None or mild pain during menses	Undefined
69.	Yang JM, China, English, 2002	690 (91 vs. 599)	A epidemiological study was conducted on18-44 years old non hysterectomised, 296 non pregnant female workers exposed to mercury vapour and 394 female workers from food processing plants working for at least 1 year and experiencing regular menstrual cycles, women using OC, IUD or steroid hormones were excluded	Exposure to metallic mercury vapour	Serious menstrual pain that affected work or required medication to relieve symptom before or during menstrual cycle	No dysmenorrhoea	Undefined
70.	Alonso C, USA, English, 2001	184	Participants represented 19% of the total college students who were enrolled in the Introduction to Psychology classes at the university of Wisconsin-Madison and 52 (28.2%) took OCs, informed consent was taken and all procedures were approved by the Institutional Review committee, >95% response rate	Social support Anxiety or depression	Dysmenorrhoea undefined	No pain during menses	Undefined
71.	Dusek, Croatia, English, 2001	168	15-21years old females, average age of athletes was 17.9+/-2.1 years vs. 17.0+/-1.1 years, female athletes from three	Athletic activity	Painful menstruation undefined	No pain during menses	Not stated

			Zagreb sports clubs as well as ballet dancers from the School of Classical Ballet in Zagreb, the group comprised of 34 runners, 10 volleyball players, 18 basketball players and 10 ballet dancers, control group comprised of 96 high school girls from the school of Textile Design in Zagreb none of who took part in any physical recreation or sports activity, none of the study subjects used oral contraception				
72.	El-Defrawi, Egypt, English, 2001	250 (189 vs. 61)	Age not defined, patients of maternal and childhood centre, Islamia, 87% acceptance and >95% follow up	Circumcision	Undefined	No pain	Not stated
73.	Balbi C, Italy, English, 2000	347 (293 vs. 54)	14-21 years old students from a professional institute in Naples were included	Early menarche (<12 years) Duration of menses> 5 days Diet	Intensity, location, duration of period pain	No period pain	Not stated
74.	Chen C, China, English, 2000	165	25.9+/-2.3 vs. 26.1+/-2.6 years, Chinese newly wed non smoking women without dysmenorrhoea, average height 1.61m, weight 54 kg, BMI 20.8 and age at menarche14 years, from Shenyang province in China, not using contraception and intending to get pregnant, 90-95% follow up	Environmental tobacco exposure (ETS) at home	Diary recording of abdominal or low back pain for at least 2 days during menstrual period	No pain during menstruation	4 months

75.	Gordley, USA, English, 2000	170	Women employees aged 18-41 (mean 29.4) years, both military and civilian from 10 air force bases were recruited, 60.3% acceptance rate, mean BMI 25.2, 56.8% married or with permanent partner, 8.2% smokers, 82.4% were in military service and 71% worked exclusively during the day	Job strain Life events Caucasian race Fuel exposure/handling Passive smoking	Pain during or just before periods requiring lying down or medications or missing work	No disabling pain during periods	Not stated
76.	Visvanathan, USA, English, 2000	516	Part of detailed baseline study of the health status of college alumnae, half of whom were college athletes and half non-athletic classmates, 516 of these were eligible for inclusion in this study as they were aged 15-44 years and had had at least one pregnancy at the time of reporting	Tubal ligation	Painful periods undefined	No pain during periods	Not stated
77.	Mishra, 2000, English, Australia	14779	Study population were women aged 18-23 years who participated in the baseline survey of the Australian Longitudinal Study on Women's Health conducted in 1996, registered on the national Medicare database, oversampling from rural and remote areas	Smoking OCP use more than 1 year Parity>2 High alcohol consumption 11-13 years of education Married/de facto Low BMI (<17) High exercise	Severe period pain sometimes or often	Period pains never or rarely	Not stated
78.	Wu D et al, China, English,	435 (129 vs. 306)	Age not stated, women who were non smokers, non drinkers, no physician diagnosed organic	CYP2D6 polymorphism Glutathione S transferase mutation	Women with pelvic or lower abdominal pain associated with menses	Women without period pains	Not stated

	2000		diseases were included				
79.	Holmlund, Sweden, English, 11999	66 (33 vs. 33)	Age 25 years, the subjects belonged to a cohort of 349 schoolgirls who participated in a longitudinal study of personality traits, no intergroup differences in civil status, length of education and experience of upbringing were found	Somatization Depression Anxiety Gravidity Abortion or miscarriage	Severe dysmenorrhoea, undefined	Pain free	Not reported
80.	Kritz S, USA, English, 1999	2912	Mean age 26 years, all women serving aboard navy ships were eligible, the study was part of the Women Aboard Navy ships Comprehensive Health and Readiness Research Project, 58% white, 32% black and 10% were other racial groups, overall mean response 52.2%	Smoking Alcohol use	Pain during periods requiring medication or time off work	Pain free	Not reported
81.	Golding, USA, English, 1998	4094	3 cross-sectional surveys: North Carolina Epidemiologic Catchment Area study –Mean age 43.9 +/- 0.7 years, 38.2% African American, 60.3% European American, 1.4% other groups, 11.8 years mean education, sample selected to represent adults in 2 mental catchment areas in North Carolina, Durham county and 4 other rural counties, 79% acceptance and 94% follow up rate Los Angeles Epidemiological	Sexual assault	Excessively painful menstrual periods	No menstrual pain	Not stated, numbers who had laparoscopy not stated

			Catchment Area study- 44.4% Latin, 44.2% European American and 11.4% other groups, mean education11.5 years, Latino residents were interviewed in English or Spanish according to their preference, National Study of Health and Life Experiences of Women (NSHLEW) participants- Mean age 46.1 +/- 0.8 years, gave informed consent, 9.7% African American, 84.3% European American and 6% other groups with mean education 12.8 years and age>/=21 years, 76% acceptance and 91% follow up rate			
82.	Di Cintio, Italy, English, 1997	251(106 vs. 145)	Median age 26 vs. 27 years, southern European, normal gynaecological examination, ultrasound and CA 125, all subjects recruited from the same outpatient service, 97% acceptance rate	Sport activities Smoking, Age at menarche Irregular menstrual cycles Duration and heaviness of menstrual flow Parity >/=2 Induced abortion>/=1 Missed miscarriages>/=1 Dietary intake of 1 or >/=2 egg per week	Dysmenorrhoea grade 2-3 on Andersh-Milsom scale	Women without dysmenorrhoea
83.	Elahi N, Pakistan, English, 1997	696 (529 vs. 167)	12-18 year old Muslim girls from schools/college of Multan city	Age Hobbies	Dysmenorrhoea categorised by severity	No dysmenorrhoea on this scale

84.	Hornsby, USA, English, 1997	358	37-39 years old participants were part of larger study of health effects of prenatal exposure to DES, women whose mothers had participated, while pregnant with them, in RCT of DES from 1950-52 were traced and interviewed in 1990, 83% acceptance rate	Smoking	Pain with menses	No menstrual pain	6 months
85.	Jamieson DJ, USA, English, 1997	581	18-45 year old women in waiting areas of five primary practices in North Carolina were approached, 83% response rate	Sexual abuse Low income	Pain often/always during menses	No pain in lower abdomen during menses	Undefined, number of women investigated undefined
86.	Harlow S, USA, English, 1996	165	17-19 years, nulliparous women starting college, not on oral contraceptive pills or intrauterine device, 31.8% acceptance rate	Menstrual cycle length Prolonged menstrual bleed (>7 days) Age at menarche Alcohol Smoker Living away from home Overweight	Pain episodes occurring 5 days prior to or during the bleed episode (data compared for no vs. severe or grade 3 dysmenorrhoea)	Women with no pain during periods	12
87.	Hewison A, UK, English, 1996	70 (47 vs. 23)	18-26 years old nursing undergraduates were asked to participate in the study, 29% used oral contraceptive pills and 54 subjects had regular periods, 56.5% response rate	Oral contraceptives Smoking Length of menstrual cycle Duration of menses	Dysmenorrhoea undefined	No dysmenorrhoea	Undefined
88.	Montero, Spain, English, 1996	1146	14-20 years old girls attending secondary schools in the municipality of Alcobendas, on the outskirts of Madrid were interviewed	Chronological age Menarche age <10 years Slimming with strong or medium BMI Diet	Dysmenorrhoea divided into mild, moderate and severe type but undefined	No dysmenorrhoea	Undefined

89.	Skierska, Poland, Polish, 1996	734 (415 vs. 319)	15-36 years, mean age 22.04+/-4.6years, cohort from Warshaw, 5.3% with university education, 48.6% with secondary education, average height 165.5 cm, average BMI 20.9+/-2.5, mean age at menarche 12.9 years	Nulligravidity Gynaecological age <5.25 years Premenstrual syndrome High physical activity	Strong cramp in suprapubic region or lower back just before or with menses needing analgesia	No dysmenorrhoea	Undefined
90.	Christiani, USA, English, 1995	895	20-40 years old (mean age 28.4 years), non alcohol, never smoking female textile workers employed in three cotton mills in Anhui province, China, 92% acceptance rate	Occupational stress	Abdominal/pelvic pain during menses	No dysmenorrhoea	
91.	Deutch B, Denmark, English, 1995	181(44 vs. 137)	20-45 years old healthy, nonpregnant women, not using contraceptive or other hormone pills, 65% married, 45% parous, 27% students, 67% with completed professional training and 6% unskilled	Daily average intake of various nutrients	Menstrual pain undefined	No menstrual pain	4 days
92.	Jarrett, USA, English, 1995	61 (27 vs.34)	21-44 years old participants were screened to determine that they were currently menstruating regularly without using birth control pills or an IUD and had no history of gynaecological or GI surgery/pathology or renal pathology, 83% were white and 64% had college degree, 78% response rate	Ever smoker PMS Alcohol 3 times/week	Severity rating for uterine cramping pain during the first 3 days of menstrual flow	No/mild uterine cramps	Undefined
93.	Waller, UK,	117 (48 vs.	Mean 35+/-4.9, 31+/-4.1, 30.9+/-	Depression	Dysmenorrhoea, dyspareunia	No pain, C/O	Undefined

	English, 1995	69)	7.5, 30.6+/-7.6 in the 4 groups: women admitted for laparoscopy for pelvic pain, infertility or sterilisation at Royal Free hospital, London or University college hospital, Cardiff were recruited, similar as regards age at coitarche, lifetime number of sexual partners and total Golombok Rust Inventory of sexual satisfaction (GRISS), divided into 4 groups: Group 1(n=38) control group of sterilisation patients with normal pelvis, Group 2 (n=31) c/o infertility with minimal to mild endometriosis on laparoscopy, Group 3 (n=18) c/o dysmenorrhoea, dyspareunia or pelvic pain with minimal-mild endometriosis on laparoscopy and Group 4 (n=30) pelvic pain with normal pelvis at laparoscopy	Anxiety Nonsensuality Vaginismus	or pelvic pain with normal pelvis or minimal-mild endometriosis	infertility with minimal-mild endometriosis on laparoscopy	
94.	Parazzini F, Italy, English 1994	251(106 vs. 145)	15-40 years old women with median age 27 years, attending gynaecology outpatient clinic in Milan, women who reported no gynaecological pathology were included as controls, 95% acceptance rate and >95% follow up rate	Smoking Alcohol	Women with moderate or severe primary dysmenorrhoea (Andersch Milsolm scale) with normal examination, negative TVS and normal CA 125	Women with no dysmenorrhoea	
95.	Freeman, USA,	165 (26 and 39 vs.	15-19 year old 165 nulliparous adolescents who completed a 2	Premenstrual symptoms Ongoing symptoms	Moderate to severe dysmenorrhoea (score 3-6)	No dysmenorrhoea	24 months

	English, 1993	100)	year longitudinal study of teenage pregnancy were used in this analysis with their consent				
96.	Gomibuchi, Japan, English, 1993,	58 (51vs. 7)	All women with endometriosis verified by laparoscopy or laparotomy, normal menstrual cycles	Extraggression trait	Undefined	No dysmenorrhoea	Undefined
97.	Heisterberg, Denmark, English, 1993	1229	14-45 years old pregnant women referred to the O&G department, university of Copenhagen for delivery or induced first trimester abortion, >95% follow up	Previous pelvic inflammatory disease (PID) Age	Undefined	No dysmenorrhoea	Undefined
98.	Messing K, France, English, 1993	726	Women aged <25->40 years, working in 17 poultry slaughterhouses and 6 canning factories in western France employed on 1/1/87	Feeling very cold Uncomfortably drafty or humid Effort exerted, either arm Unable to leave position freely at work Cannery worker Age<25 years^ Smoking Oral contraceptives (OC) Nulliparity 3 or fewer breaks/day Irregular beginning of work day Work always needs full attention	Lower abdominal pain just before and/or during period	Women with no pain just before or during periods	
99.	Rulin MC, USA, English, 1993,	966 (121 vs. 698)	Mean 28 vs. 27 years, low income, ethnically and regionally diverse 500women from three participating institutions who underwent sterilisation 3-4.5	Sterilisation	Bad menstrual cramps	No menstrual pain	3-4.5 yrs

			years earlier answered the questionnaire, modified Pomeroy technique used for puerperal sterilisation, interval sterilisation was done by falope bands or bipolar electrocautery, women taking OC (147) in the control group were excluded from analysis leaving 319 women as third and purer control group, 78% follow up,				
100	Ng, Singapore, English, 1992	415	From a sampling frame of all housing development board flats in Clementi town, a two stage cluster sampling was used to draw a random sample of 480 households with 15-54 years old women, 30.3% Chinese, 28.8% Malay, 30.6% Indian, 36.8% married, 30.7% employed, 72% individual response rate	Age<30 Menarche <12 years Nulliparity Physical activity Smoking Oral contraceptives	One or more episodes of menstrual cramp or pain in the previous year not due to diagnosed gynaecological disease	No episode of menstrual pain	Undefined
101	Izzo A, Italy, English, 1991	483 (357 vs.126)	16-23 years old women from various schools in Campania belonging to the same race and socio-cultural background	Sport activities before menarche Habitual smoking	Pain which precedes by a few hours or accompanies menstrual flow	Women with no pain during periods	Not stated
102	Lee, USA, English, 1991	594 (321 vs. 273)	Data from a larger study of 21-50 years old women working as nurses in seven hospitals on the west coast. Excluded subjects were over 50 years of age, not menstruating, or had been pregnant or lactating during the six months prior to completing	Nulliparity Duration of menses Heavy menstrual blood loss Caucasian race OC use	Cramps just before or at the start of menstrual period	No menstrual pain	Undefined

			the questionnaire between October 87-june 1988, each worked 32-55 hours per week, 86.1% Caucasian, 58.3% married or partnered, 53.5% had been pregnant and 65.8% had no living children at home, 69% response rate				
103	Robinson J, USA, English, 1991	308	</=18yrs, unmarried, not pregnant, wishing contraception, 77% black inner city population, 72% acceptance rate and 87% follow up rate	Consistent OC pill use Smoking Alcohol	Dysmenorrhoea on Andersh-Milsom scale	No severe dysmenorrhoea on this scale	6
104	Bukman, Netherlands, English, 1990	76 (37 vs.39)	30.1+/- 4.2 vs. 34.2+/- 5.1 years, 50 women with infertility of 1 year, having regular menstrual cycles and ovulation and visiting infertility clinic. Control group from general practice not wishing to get pregnant and not using oral contraceptives or intrauterine devices, acceptance rate 72.5 vs. 50%	Involuntary infertility	Low abdominal pain some hours prior to and during menstruation	No dysmenorrhoea	Undefined
105	Holmlund U, Sweden, English, 1990	349	All girls attending a classroom session in 1973 in 8th grade in the city of Norrkoping, a medium size Swedish city were interviewed initially. They were born in 1958-59. In 1983, after exclusion of incomplete questionnaires and impossibility of tracing current addresses, the subjects were contacted and asked to fill in and return the	Neurotic self-assertiveness Feminity	Dysmenorrhoea undefined	No dysmenorrhoea	Undefined

			questionnaires, 73% follow up rate				
106	Okonfua, Nigeria English, 1990	133	20.23+/-2.5 vs. 21.86+/-2.79 years old women athletes participating in the bi-annual interuniversity games held at university of Abadan, Nigeria in April 1986 were approached, subjects' age weight, height ranged between 16-28 years, 42 and 83 kg and 51 and 75 inches respectively, noncontact sports athletes were younger, lighter and leaner than contact sports athletes	Contact sports activity	Undefined	No dysmenorrhoea	Undefined
107	Sundell G, Sweden, English, 1990	489	1 in 4 women from population register who were residents in city of Gothemberg who had participated in epidemiological study of dysmenorrhoea at the age of 19 years were invited, 91% acceptance rate and 83% follow up rate	Parity Oral Contraceptives Intrauterine device Menarcheal age BMI Duration of menstrual flow Length of the cycle Smoking Physical exercise Parity Abortion or miscarriage	Mild, moderate or severe dysmenorrhoea on verbal multidimensional scoring system	No pain during periods	Undefined
108	Fisher, USA, English, 1989	207	The survey was administered to 16-18 years old female patients and friends (mean age 17.6 years) in the waiting room of the Five Towns Adolescent Health Service, a general health facility	Premenstrual symptoms	Mild, moderate or severe dysmenorrhoea	No pain during periods	Undefined

			for teenagers located in a middle to upper-middle class suburb of New York City between Sep 1985-May 1986, predominantly white (86%), most were catholic (55%) or Jewish (32%), 59% were in high school				
109	Stambolov, Bulgaria, Bulgarian, 1989	324	18-39 yrs vs. 19-41 yrs, women hospitalised in medical institute, Pleven, Bulgaria with a diagnosis of adnexitis between 1979-1984 and 1985-86, controls were healthy fertile women	PID	Undefined	No dysmenorrhoea	1-6 years
110	Teperi J, Finland, English, 1989	3370	12-18 years, all girls born on consecutive days in July 1964, 66,68,70 derived from national population registry, 87% acceptance rate and 80-90% follow up rate	Gynaecological age Duration of menses Physical condition Alcohol Briskness in the morning	Menstrual pain needing medication or absenteeism from work	No menstrual pain	Not stated
111	Brown S, UK, English, 1988	2092	18-49 years old women experiencing menstruation and registered with two GP practices in Milton Keynes were included, 22.5% < 24 years, 35.2% between 25-34 years, 33.8% 35-44 years, 8.5% 45-49 years, 30.1% nulliparous, 52.5% Para 1, 16.2% Para 2 and 1.2% Para 5 or more, 48.1% never smokers, 35.4% social class I-II, 13.7% social class IV-V, 74% acceptance rate	Smoking Oral Contraceptives Intrauterine device Tubal sterilisation	Painful periods in most months	Periods not painful	Not stated

112	Pullon, New Zealand, English, 1988	1456 (772 vs. 684)	20-45 years old women surveyed, 80% of the women who were currently menstruating were included in the analysis, GP surgeries randomly selected in June 1985 and 76% of the surgeries approached participated	Length of the cycle, Smoking, Premenstrual syndrome, Occupation, Parity, Contraception	Pain with periods	No pain with periods	Undefined
113	Shaver, USA, English, 1987	153 (55 vs. 98)	18-32 years old dysmenorrhoeic women were selected from those women who responded by phone to a university community advertisement, age matched non dysmenorrhoeic women were randomly selected from a census listing for 5 neighbourhoods in a large south-eastern city, mean age 25.8+/-3.1 vs. 27.3+/-3.8 years, 90.9% Caucasian vs. 65% in non dysmenorrhoeic group, 60% vs. 80% were employed, 34.5 vs. 76.5% were protestant, 93% response rate	Heavy menstrual flow Duration of menstrual flow Premenstrual symptoms	Dysmenorrhoea undefined	No dysmenorrhoea	Undefined
114	Whittle GC, UK, English, 1987	50 (25 vs. 25)	29.7+/-7.5 vs. 28.1+/-7.5 years old women attending a health centre in Manchester were asked to participate if they fulfilled following criteria: had regular menstrual cycles, were not on Oral Contraceptives, Caucasian origin, not on psychotropic medication and were not in premenstrual phase of their cycle when interviewed, the two groups were not significantly	Nulliparity Somatisation Depression Overall support Negative support Positive support	Abdominal pain during menstruation occurring in the absence of pelvic pathology	No dysmenorrhoea	Not stated

			different in social class, marital status or parity				
115	Toriola AL, Nigeria, English, 1986	1081	18-25 year old women between years 1984-85, athletes in various sports with at least 3 years experience of national level competitive sports, non-athletes selected from women attending secondary schools, colleges or universities in the same localities where the athletes trained	Athletic sports	Undefined	No dysmenorrhoea	Not stated
116	Mergler D, Canada, English, 1985	318 (211vs. 107)	15-35 years old women working in 8 poultry houses and controls were full time housewives married to male slaughterhouse workers who were not pregnant, not menopausal, not amenorrhoeic or not undergone hysterectomy	Slaughterhouse worker Very cold working atmosphere	Lower abdominal pain during period	Women without lower abdominal pain during period	Undefined
117	Wilson, USA, English, 1984	327	All new female students entering a large independent coeducational secondary school answered a questionnaire about their menstrual history as part of health record in 1980 and 1981, follow up questionnaires and menstrual calendars were obtained on 3 separate occasions, mean age 15.45+/- 1.11 years, mean age at menarche 12.57+/- 1.12 years, 72.5% with regular cycles, 250 boarders and 64 day students, 313 white and 14 black	Type and hours of exercise BMI Chronological age Gynaecologic age	Dysmenorrhoea divided into mild, moderate and severe type	No dysmenorrhoea	Not stated

			students, 52.5% had dysmenorrhoea, 87 girls responded to the follow up, no significant differences in place of residence, menstrual characteristics or hours of exercise per day between responders and non responders				
118	Andersch B, Sweden, English, 1982	596(431vs. 165)	All women born in 1962 aged 19 years at the time of the study, residing in Gothemberg city, 73% acceptance and follow up rate	OCs Early menarche Duration of menses Height, weight Parity Smoking Heredity	Painful menstruation- mild, moderate or severe (Data compared for severe vs. no dysmenorrhoea)	Painless menstruation	Undefined
119	Klein J, USA, English, 1981	2699 (1611 vs. 1088)	12-17 years, data from the national health examination survey cycle III collected between 1966-1970 by the National Centre for Health Statistics, >95% follow up rate	Chronological & gynaecological age Socio-economic status	Crampy lower abdominal pain occurring during menses	No dysmenorrhoea	Undefined
120	Wood, Australia, English, 1979	2343	Data from 15-59 year old women attending Shepherd foundation for comprehensive health check	Country of birth Marriage Nulliparity Education Occupation Smoking Alcohol OCs Emotional difficulties Suicidal tendency	Undefined	No pain with periods	Undefined

121	Malina R, USA, English, 1978	48	Subjects from university, college athletes, nonatheletes and Olympic basketball athletes, all except one white, >95% follow up	College athletics Olympic athletics	Undefined	No dysmenorrhoea	Not stated
122	Wood, Australia, English, 1978	1180	Melbourne Metropolitan health and social survey, Victoria in 1971	Smoking Neuroticism Psychiatric diagnoses	Sufficient discomfort to disrupt life for one day during periods or to see a doctor or have medications prescribed	No discomfort enough to disrupt life during periods	Undefined
123	Timonen, Finland, English, 1973	748	Sample was drawn by sending a questionnaire to one-tenth of the female students at the university of Helsinki and to female students at the Institute of Physical Education, Jyvaskyla, 65% were 21-24 years old range: 18-28 years	Premenstrual symptoms	Menstrual pelvic pain	No pain during periods	Undefined
124	Sehgal, India, English, 1971	384 (172 vs.212)	16-25 years old college girls of Banaras Hindu university residing in 3 hostels inside the university campus were interviewed, 82.3% were from urban areas and 91% were Hindus, 79.5% were below 21 years of age and 5.2% were married, 83% response rate	Exercise Heavy menstrual flow Premenstrual symptoms Psychological symptoms	Pain during menses categorised as mild, moderate or severe	No pain during menses	Undefined
125	Widholm O, Finland, English, 1971	5399	10-20years old girls who had started menstruating and their mothers were included in the study	Physical constitution Gynaecological age Maternal dysmenorrhoea Social group	Pain with menstrual periods	No pain during periods	Undefined
126	Hirt, USA, English,	105	Subjects used in this study were freshman student nurses at a	Anxiety Neuroticism	Cramps before or during menstruation	No pain during or before	Undefined

1967	large metropolitan hospital, relatively homogenous in age and socio-economic status, all received physical examination	periods

Appendix 3.6: Table of quality assessment of studies on risk factors in dysmenorrhoea

No.	Authors, year	Study design	Recruitment of study subjects	Method of ascertainment of risk factor	Method of Ascertainment of outcome	Temporality	Control for confounding	List of confounding factors	Quality criteria satisfied*
1.	Pawlowski, 2004	Cross-sectional	Not defined	Interview-not validated	Interview	Not studied	Yes	Age, age at birth of first child, BMI, age at menarche	1
2.	Harlow BL, 2002	Cross-sectional	Not defined	Questionnaire- not validated	Questionnaire	Yes	Yes	Age, race, educational status, body mass index, parity, years of OC use	2
3.	Hirata, 2002	Cross-sectional	Not defined	Questionnaire-validity not stated	Questionnaire	No	No	None	0
4.	Walvaren, 2002	Retrospective, cross sectional	Random	Semi-structured interviews- validity not stated	Examination	No	Yes	Age, parity	3
5.	Yang, 2002	Retrospective, cross sectional	Volunteers	Questionnaire-not validated	Questionnaire	Not studied	Yes	Parity, work duration	2
6.	Alonso C, 2001	Retrospective, cross sectional	Consecutive	Norbeck social support questionnaire,	Questionnaire	No	Yes	OC use	3

				menstrual cycle questionnaire, BDI and STAI-validated					
7.	Runtz, 2002	Retrospective, cross sectional survey	Undefined	Validated questionnaire	Questionnaire	Yes	Yes	Age, stage of menstrual cycle	3
8.	Dusek, 2001	Retrospective, cross-sectional survey	Undefined	Questionnaire-validity not stated	Questionnaire	Not studied	No	None	0
9.	Balbi C, 2000	Retrospective, cross sectional survey	Undefined	Interview and questionnaire-valid	Pelvic USS and hormonal tests	Not studied	Yes	Not stated	3
10.	El-Defrawi, 2001	Blinded, cross-sectional survey	Random	Gynaecological examination followed by a semi structured psychiatric interview, based on Arabic version of the sexual behaviour assessment schedule-adult (SEBAS-A) (validated)	Questionnaire	Yes	No	None	4
11.	Chen C, 2000	Prospective, cohort	Not defined	Baseline questionnaire and daily diary	Daily diary	Yes	Yes	Age, education, BMI, season, area of residence, occupation, shift work, stress,	3

								passive smoking at work, occupational exposure to chemical hazards, dust and noise	
12.	Gordley, 2000	Cross sectional study	Not defined	Validated Questionnaire	Questionnaire	Not stated	Yes	Marital status, age, educational level, smoking status, race, military versus civil employment status, occupational jet fuel exposure	2
13.	Visvanathan, 2000	Cross sectional study	Consecutive	Questionnaire-validity not stated	Questionnaire	Not stated	Yes	Age, athletic status	2
14.	Mishra, 2000	Cross sectional study	Random	Mailed Questionnaire-validity not stated	Questionnaire	Not stated	Yes	Age, marital status, education, parity, area of residence, OCP use	2
15.	Wu D et al, 2000	Cross sectional study	Random	Questionnaire and blood test	Questionnaire interview	Yes	Yes	Age, parity, education, use of oral contraceptives or intrauterine device, occupation, age	4

								at menarche, height and BMI	
16.	Holmlund, 1999	Retrospective, case-control	Not defined	SCL-90 checklist and questionnaire by interview	Questionnaire	No	No	None	1
17.	Kritz S, 1999	Cross sectional survey	Consecutive	Validated questionnaire	Questionnaire	No	Yes	Age, race, pay grade, each behavioural and lifestyle variable	3
18.	Golding, 1998	Retrospective, cross sectional survey	Multistage area probability sampling from household residents >18 years old	Validated Somatisation section of Diagnostic Interview schedule+ series of questions on lifetime sexual assault	Interview	Not stated	Yes	Age, ethnicity, education	3
19.	Di Cintio, 1997	Retrospective, case-control	Not defined	Standard questionnaire	Visual analogue scale and questionnaire (based on Andersch-Milsolm classification)- multidimensional score	Not studied	Yes	Age, smoking, parity, education, selected menstrual characteristics	2
20.	Elahi N, 1997	Cross-sectional survey	Random	Questionnaire, outcome-categorised as- 1. No effect 2. Mild-no effect on daily activity 3.	Questionnaire	Not studied	Yes	Age, income of parents	3

				Moderate- daily activity restricted, 4 severe- unable to perform daily activity					
21.	Hornsby, 1997	Prospective, cohort	Other (participants part of another larger study)	Telephone interviews by trained interviewers- valid method	Menstrual diary	Not studied	Yes	Analgesic use, duration of bleeding, exercise, stress	4
22.	Jamieson DJ, 1997	Retrospective, cross-sectional survey	Consecutive	Validated questionnaire developed for the National Population Survey of Canada	Questionnaire	Yes for childhood sexual abuse	Yes	Age, parity, education, income, marital status, race	5
23.	Harlow S, 1996	Prospective, cohort	Not defined	Questionnaire	Menstrual diary	Not studied	Yes	Smoking, alcohol, stress, Benn's index (weight corrected for height)	3
24.	Hewison A, 1996	Cross sectional	Not defined	Questionnaire- validity not stated	Questionnaire	Not studied	No	None	0
25.	Montero, 1996	Cross-sectional	Voluntary	Interview- validity not stated	Interview	Not studied	Yes	Age	1
26.	Skierska, 1996	Cross sectional	Random	Standard questionnaire- anonymous interview by	Interview	Not studied	Yes	Not stated	3

				trained interviewers					
27.	Christiani, 1995	Cross sectional	Not defined	Questionnaire-validity not stated	Questionnaire	Not studied	Yes	Abortion, age, job title and mill of employment	1
28.	Deutch B, 1995	Prospective, cohort study	Volunteers	2 X4 day dietary records to calculate average daily nutrients	Self reported questionnaires	Not studied	No	None	2
29.	Jarrett, 1995	Prospective, cohort study	Not defined	Questionnaire + menstrual diary-valid	Questionnaire	Not studied	Yes	Number of stressful daily events etc	2
30.	Waller, 1995	Retrospective, case-control	Not defined	Psychometric tests - Beck's Depression Inventory (BDI)	Laparoscopy	Not studied	No	None	2
31.	Parazzini F, 1994	Retrospective, case-control	Not defined	Validated Questionnaire by interview	Validated questionnaire: Milsolm-Andersch scale	Not studied	Yes	Age, education, parity, oral contraceptive use, smoking, alcohol consumption	2
32.	Freeman, 1993	Cross-sectional	Not defined	Validated questionnaire	Questionnaire	Not studied	Yes	Age	2
33.	Gomibuchi, 1993	Retrospective, case-control	Not defined	Questionnaire-Rosenzweig picture frustration study	Interview	Not studied	No	None	1

34.	Heisterberg, 1993	Retrospective cohort	Not defined	Questionnaire	Questionnaire	Not studied	Yes	Previous spontaneous abortions, number of induced abortions, previous PID, parity and age	2
35.	Messing K, 1993	Cross-sectional survey	Consecutive	Questionnaire-valid	Data collection at annual consultation with the occupational health physician	Not studied	Yes	Age, parity, contraceptive and tobacco use	3
36.	Rulin MC, 1993	Prospective, cohort	Not defined	Record of interval or laparoscopic sterilisation	Interview by questionnaire	Yes	Yes	Oral contraceptive use	5
37.	Ng, 1992	Cross-sectional	Random	Structured and validated questionnaire	Questionnaire	Not studied	Yes	Unclear	3
38.	Izzo A, 1991	Retrospective, case-control	Not defined	Not defined	Not defined	Not studied	Yes	Age, race, socio-cultural background	2
39.	Lee, 1991	Cross-sectional	Consecutive	Questionnaire-validated	Questionnaire	Not studied	No	None	2
40.	Robinson J, 1991	Prospective, cohort	Consecutive	Validated dysmenorrhoea score	Questionnaire	Yes	Yes	Age, race, mother's education	5
41.	Bukman, 1990,	Retrospective, case-control	Not defined	Validated questionnaire	Physical examination and/or laparoscopy	Not studied	Yes	Age	3
42.	Holmlund U, 1990	Prospective, cohort	Consecutive	Attitude interest schedule, Cesarec	Questionnaire	Yes	No	None	4

				Marke Personality Schedule and menstrual questionnaire-validated					
43.	Okonfua, 1990	Cross sectional survey	Random	Questionnaire-nonvalidated	Questionnaire	Not studied	No	None	1
44.	Sundell G, 1990	Prospective, cohort	Systematic random sampling	Questionnaire-validated	Questionnaire	Not studied	No	None	3
45.	Fisher, 1989	Cross sectional survey	Consecutive	Premenstrual Assessment Form-validated	Examination	Not studied	No	None	3
46.	Stambolov, 1989	Retrospective, case-control	Not defined	Hospital record	Interview	Not studied	Yes	Age, socio-economic status, employment	2
47.	Teperi J, 1989	Cross sectional survey	Consecutive	Questionnaire, validity undefined	Questionnaire	Yes for gynaecological age and duration of menses, not studied for others	Yes	Age, physical activity, alcohol consumption, number of unhealthy practices, region of residence, occupation of father or single mother, type of school	3
48.	Brown S, 1988	Cross-sectional	Not defined	Validated questionnaire	Validated questionnaire	Not studied	Yes	Age, parity, social class and contraceptive use	2

49.	Pullon, 1988	Cross sectional study	Random	Interview-validation undefined	Interview	Not studied	Yes	Age, parity and smoking	3
50.	Shaver, 1987	Case-control study	Volunteers for cases and random for controls	MSQ, Recollections of menarche scale, menstrual attitudes questionnaire, health perception questionnaire	Questionnaire	Not studied	Yes	Age	3
51.	Whittle GC, 1987	Case-control study	Not defined	Modified Zung Questionnaire for depression, Modified Somatic Perception Questionnaire-validated	Interview	Not studied	Yes	Oral contraceptives, regularity of menstrual cycles and Caucasian origin	2
52.	Toriola AL, 1986	Retrospective, case-control	Not defined for cases and random for controls	Validated questionnaire	Validated questionnaire	Not studied	Yes	Body size, fat, weight	2
53.	Mergler D, 1985	Cross sectional	Not defined	Multiple choice questionnaire	Questionnaire	Not studied	No	None	1
54.	Wilson, 1984	Prospective, cohort	Consecutive	Questionnaire + syntax menstrual calendar	Questionnaire	Not studied	No	None	3
55.	Andersch B, 1982	Cross-sectional survey	Random 1 in 4	Validated questionnaire	Validated questionnaire	Not studied	No	None	2

56.	Klein J, 1981	Cross-sectional survey	Not defined	Questionnaire (validated), psychometric development not reported	Questionnaire	Yes	Yes	Socio-economic status, race and preparation for menarche	3
57.	Wood, 1979	Cross-sectional survey	Not defined	Not defined	Not defined	Not studied	No	None	0
58.	Malina R, 1978	Cross-sectional survey	Not defined	Interview by 1 investigator	Questionnaire	Not studied	No	None	2
59.	Wood, 1978	Cross-sectional survey	Stratified sampling for each social stratum	Interview by 5th year medical student- validated	Interview by medical student	Not studied	Unclear	Unclear	2
60.	Timonen, 1973	Cross-sectional survey	Not defined	Questionnaire- not validated	Questionnaire	Not studied	No	None	0
61.	Sehgal, 1971	Cross-sectional survey	Not defined	Questionnaire-validated	Questionnaire	Not studied	No	None	1
62.	Widholm O, 1971	Cross-sectional	Not defined	Questionnaire	Questionnaire	Yes	No	None	2
63.	Hirt, 1967	Cross-sectional	Volunteers	Semi-objective criteria for teenage dysmenorrhoea and 16 personality factor questionnaire	Examination	Not studied	No	None	3

Appendix 3.7: Table of results from studies on risk factors in dysmenorrhoea

Author, year	Risk factor/ Exposure	Exposed with dysmenorrhoea (%) / mean score in those with dysmenorrhoea	Exposed without dysmenorrhoea (%) / Mean score in those without dysmenorrhoea	Measure of association- Odds ratio or mean difference	99% Confidence interval	P value	Comments
Mishra, 2000	Oral contraceptive use > 1 year	2234/4699 (47.54)	4317/7553(57.16)%	0.68	0.62-0.75		
Hewison, 1996	Oral contraceptives	9/47 (19.2%)	11/23 (47.82)	0.25	0.06-1.06		
Messing K, 1993	Oral contraceptives	108/290 (37.24%)	141/285 (49.47%)	0.61	0.39-0.94		Compared with all other methods/no method used
Ng, 1992	Oral contraceptives	12/213 (5.63)	7/202 (3.47)	1.64	0.49-5.5		
Lee, 1991	Oral contraceptives	80/321(24.92)	76/273 (27.84)	0.86	0.53-1.39		
Robinson J, 1991	Consistent Combined oral contraceptive pill use	94/245 (38.37)	24/63 (38.1)	1.01	0.57-1.79	1	95% CI Consistent COC use was defined as missing less than 3 pills per cycle
Brown S, 1988	Oral contraceptives	127/564 (22.52)	403/1133 (35.57)	0.54	0.41-0.73		Compared to no contraception, barrier methods or whose partners had vasectomy

Wood, 1979	Oral contraceptives	56/170 (32.94)	253/496 (51)	0.48	0.31-0.77		Pain much less in women on the pill than women using other or no contraceptives
Sundell G, 1990	Oral contraceptives	102/162 (62.96) (Mild dysmenorrhoea)	99/153 (64.71)	0.93	0.51-1.70		
Sundell G, 1990	Oral contraceptives	33/100 (33) (Moderate dysmenorrhoea)	99/153 (64.71)	0.28	0.15-0.55		
Sundell G, 1990	Oral contraceptives	13/45 (28.89) (Severe dysmenorrhoea)	99/153 (64.71)	0.23	0.1-0.56		
Di Cintio, 1997	Oral contraceptives	56/106 (53)	76/145 (52)	1.02	0.53-1.96	1	Control group includes current and ex-users
Pullon, 1988	Hormonal Contraception	48%	58% Barrier or no contraception				Dysmenorrhoea lowest in group which used hormonal contraception and highest with no contraception or barrier methods
Andersch B, 1982	Oral contraceptives	28/86 (32.56)	88/160 (55)	0.41	0.20-0.81	<0.01*	Compared to those using IUD or no contraception
Messing K, 1993	Intrauterine device	59/241(24.5%)	43/234 (18.38%)	1.44	0.81-2.55		Compared to those using other/no methods but not OC
Sundell G, 1990	Intrauterine device	39/145 (29.9)	13/50 (26)	1.05	0.40-2.71		

Brown S, 1988	Intrauterine device	46/132 (34.85)	403/1133 (35.57)	0.97	0.59-1.59	Compared to no contraception, barrier methods or whose partners had vasectomy
Harlow BL, 2002	Sterilisation	25/97 (25.8%)	191/869 (22%)	1.24	0.64-2.41	
Visvanathan, 2000	Sterilisation	24/122 (19.7%)	32/394(8.12%)	3.29	1.40-7.76	
Rulin MC, 1993	Sterilisation	80/121 (66.12)	420/698 (60.17)	1.28	0.76-2.16	Preoperative prevalence in both groups 11.6%, control group not sterilised and not on OCs
Brown S, 1988	Tubal sterilisation	91/227 (40.09)	140/387 (36.18)	1.18	0.76-1.84	Compared to no contraception, barrier methods or whose partners had vasectomy
Mishra, 2000	Smoking< 10/day			1.2*	1.1-1.4*	95% CI 2X2 data not extractable, crude OR as given by the authors
Mishra, 2000	Smoking 10-20/d			1.5*	1.3-1.7*	
Mishra, 2000	Smoking>/=20/d			1.4*	1.3-1.6*	
Kritz S, 1999	Smoking	284/752 (37.77)	690/2070 (33.33)	1.22	0.97-1.53	
Di Cintio, 1997	Smoking	38/106 (36)	39/145 (27)	1.52	0.75-3.1	
Hornsby,	Smoking	Mean days 2.5	Mean days 2.1	MD 0.4	0.0-0.9	Adjusted menstrual

1997							characteristics by smoking status*/smokers experience more pain, with the effect being greatest in the heaviest smokers
Hornsby, 1997	Smoking	Mean days 2.7	Mean days 2.0	MD 0.7	0.3-1.2	-	Unadjusted by smoking status
Hornsby, 1997	Smoking </= 1/2 pack/day	Mean days 2.1	Mean days 2.0	MD 0.1			
Hornsby, 1997	Smoking>/=1/2 pack/day	Mean days 2.9	Mean days 2.1	MD 0.8		0.003*	* For exposure trend test
Harlow S, 1996	Smoking	15/64 (23.44%)	7/45 (15.56%)	1.52	0.64-3.58		
Hewison, 1996	Smoking	11/47 (23.4)	7/23 (30.4)	0.7	0.16-3.08		
Jarrett, 1995	Smoking	8/27(29.63) Ever smoker	3/34 (8.82)	3.99	0.72-22.14		
Ng, 1992	Smoking	8/213 (3.76)	8/202 (3.96)	0.95	0.25-3.52		
Izzo A, 1991	Habitual smoking (>10 cigarettes/ day)	88.88%	11.12%				2 x 2 table cannot be constructed
Messing K, 1993	Smoking	110/347 (31.7%)	79/373 (21.18%)	1.72	1.11-2.66	0.001*	Compared with non or ex smoker
Robinson J, 1991	Smoking					<0.08*	
Sundell G, 1990	Smoking	141/313 (45.05)	57/144 (39.58)	1.25	0.74-2.11		95% CI Severity of dysmenorrhoea

							was increased in smokers compared with non-smokers and increased significantly (P<0.01) with the no. of cigarettes smoked/day
Brown S, 1988	Smoking	221/517 (42.75)	394/1070 (36.82)	1.28	0.97-1.7		Compared to never smokers
Brown S, 1988	Smoking	221/366 (60.38)	394/702 (56.13)	1.19	0.85-1.67		Compared to ex-smokers
Brown S, 1988	Smoking	148/441 (33.56)	308/984 (31.3)	0.96	0.7-1.32		Ex-smokers compared to never smokers
Brown S, 1988	Smoking	221/662 (33.38)	394/1378 (28.59)	1.26	0.96-1.64		Compared to never and ex smokers, chi square linear trend p<0.05*
Andersch B, 1982	Smoking					<0.01*	Smokers as compared to non-smokers had significantly less dysmenorrhoea
Wood, 1979	Smoking	136/220 (68)	91/213 (42.72)	2.15	1.31-3.52		Menstrual pain tended to increase with increase in cigarettes smoked per day (10 or less-56%, 10-20-60%, >20-62%)
Wood, 1978	Smoking	39%	29%			0.03*	Lack of dose-response relationship
Chen C, 2000	Environmental tobacco exposure			1.3*	1.0-1.8*	0.03*	Risk of dysmenorrhoea increases by 30% for each

	(ETS) at home						2 cigarettes smoked by others at home
Chen C, 2000	Low ETS exposure	15/29 (51.72)	145/276 (52.54)	0.97, 1.1*	0.35- 2.65, 0.5-2.6*	1, 0.8*	Low ETS-<0.8 cigarettes per day, data reported on number of cycles
Chen C, 2000	Middle ETS exposure	22/36 (61.11)	138/269 (51.30)	1.48, 2.5*	0.59-3.69, 0.9-6.7*	0.35, 0.08*	Middle ETS- 0.8-2.5 cigarettes/day
Chen C, 2000	High ETS exposure	27/41 (65.85)	133/264 (50.38)	1.86, 3.1*	0.78-4.41, 1.2-8.3*	0.02*	High ETS- >2.6 cigs/day, significant dose-response relationship between ETS exposure and risk of dysmenorrhoea * are adjusted values given by authors
Gordley, 2000	Passive smoking	21/53 (39.6%)	29/117 (24.8%)	2.03, 2.03*	0.8 –5.17 0.98-4.18*	<0.1	2X2 table estimated from given data
Hornsby, 1997	Passive smoking	Mean days 2.6	Mean days 2.0	MD 0.6			
Mishra, 2000	High alcohol consumption (> 2 drinks/day)	2055/4612 (44.56)	3211/6999 (45.88)	0.95	0.86-1.05		
Kritz S, 1999	Alcohol	351/712 (49.3)	1015/2070 (49.03)	1.01	0.81-1.26		
Harlow S, 1996	Alcohol >once/week	13/76 (17.1)	14/64 (21.88)	0.74, 0.76*	0.24-2.22 0.53-1.09*		In women who had pain, alcohol consumption increased the severity and duration of pain
Jarrett, 1995	Alcohol 3 times/week	4/27 (15%)	7/34 (19%)	0.68	0.12-3.78		

Parazzini F, 1994	Alcohol (1-7 drinks/week)	26/106 (24.53)	39/145 (26.9)	0.88	0.42-1.87		Computed assuming a comparable pure alcohol content in wine (125ml) and beer (333 ml) drinks, RR 1.3 (0.6-2.5)*
Parazzini F, 1994	Alcohol (8-28 drinks/week)	18/106 (16.98)	30/145 (20.68)	0.79	0.34-1.82		Heavy alcohol consumption appeared to reduce the risk of dysmenorrhoea but these findings are not estimated with great precision, RR 0.8 (0.4-1.7)*
Teperi J, 1989	Alcohol					<0.001*	
Wood, 1979	Alcohol (> 4 drinks at a time)	27/44 (61.36)	165/379(43.54)	2.05	0.9-4.67	0.03	Menstrual pain was not related to the frequency of drinking but to the number of drinks taken at each drinking session: 41% in women taking 1-2 drinks at a time to 56% in women taking more than 4 drinks at a time, P= 0.02*
Dusek, 2001	Athletic activity	18/67 (26.87%)	55/96 (57.29%)	0.29	0.13-0.67		
Mishra, 2000	High exercise	3143/4103 (76.6)	5055/6327 (79.9)	0.82	0.7-0.9	<0.0001	
Skierska, 1996	High physical activity	149/415 (35.90)	92/319 (28.84)	1.38, 1.15*	0.72-0.93, 0.82-1.62*		Hard physical work or regular recreational activities
Ng, 1992	High physical	48/213 (22.54)	42/202 (20.79)	1.11	0.6-2.05		

	activity						
Izzo A, 1991	Athletic sports	56/112 (50)	129/169 (76.33)	0.31	0.16-0.60		
Okonfua, 1990	Contact sports activity	27/77 (35.1)	20/56 (35.7)	0.97	0.38-2.5		Contact sport is an athletic/recreational event in which the players can have physical collision with each other, control group are those who play non contact sports
Teperi J, 1989	Briskness in the morning					<0.001*	No dose-response relationship with feeling active in the morning
Toriola, 1986	Athletic sports	80/175 (45.71)	395/906 (43.6)	1.09	0.71-1.67		Swimmers and sprinters had more dysmenorrhoea than the athletes in other sports
Wilson, 1984	Exercise					0.34	
Malina R, 1978	Athletics	19/39 (48.72)	7/27 (25.9)	2.56	0.69-9.49		
Sehgal, 1971	Exercise	101/172 (58.72)	71/212(33.5)	2.77	1.63-4.7		
Izzo A, 1991	Sport activities before menarche	178 / 357 (49.86)	83/126 (65.87)	0.31	0.16-0.6		64.86% regression or improvement in pain after the beginning of athletic activity
Elahi N, 1997	Presence of hobbies					<0.001*	Respondents with hobbies have significantly lower dysmenorrhoea

Elahi N, 1997	Age					<0.01*	Significant relationship between the age and severity of dysmenorrhoea
Montero, 1996	Chronological age <14 years	13/157 (8.28)	7/93 (7.52)	1.11	0.32-3.83		
Heisterberg, 1993	Age			0.94*	0.91-0.97*		Increasing age reduced the rate of dysmenorrhoea
Walvaren, 2002	Age<25 years	44/85 (51.76)	228/522 (43.68)	1.39	0.76-2.54		
Messing K, 1993	Age<25 years	44/337 (13.1%)	35/387 (9.04%)	1.51	0.82-2.79		Compared with age>25
Ng, 1992	Age<30 years	115/213 (54)	59/202 (29.2)	2.76	1.65-4.61		
Klein J, 1981	Chronological age	436/690 (63.19) Age 17 years	170/567 (29.98) Age 12 years	4	3.16-5.08	<0.0001	
Wilson, 1984	Chronological age					0.001	Those with dysmenorrhoea had significantly higher chronological and gynaecological age
Wilson, 1984	Gynaecological age					0.0001	
Klein J, 1981	Tanner’s stage 5	115/201 (57.21)	59/199 (29.65) Tanner’s stage 3	3.78	2.82-5.06		
Di Cintio, 1997	Age at menarche 12-13 years	54 /106(50.94)	74 /145(51.03)	1	0.52-1.92		*RR1.2 (0.6-2.4) (* authors' quoted figures as estimates from multiple logistic equations

							including terms for age, education, smoking, parity and other variables
Di Cintio, 1997	Age at menarche > 13 years	21/106(19.81)	20/145 (13.79)	1.55	0.64-3.77		*RR 2.1(0.8-5.5)
Balbi, 2000	Age at menarche < 12 years	88%	81%			<0.05*	
Di Cintio, 1997	Age at menarche < 12 years	31/106 (29.25)	51/145(35.17)	0.76	0.38-1.54		*RR 1
Robinson J, 1991	Age at menarche < 12 years	86/245 (35.1)	16/63 (24.6)	1.55	0.72-3.35		
Harlow S, 1996	Age at menarche-11 years			1.43*	0.95-2.15*		
Harlow S, 1996	Age at menarche-15 years			0.71*	0.46-1.06*		
Montero, 1996	Menarcheal age <10 years	32/720 (4.44)	7/417 (0.98)	2.30	0.96-5.5	0.02	
Pawlowski, 2004	Age at menarche	12.9+/-1.5(n=50)	12.8 +/-1.3 (n=127)			0.59	
Skierska, 1996	Gynaecological age <5.25 years	282/415 (67.92)	178/319 (55.8)	1.68, 1.35*	1.24-2.27, 0.92-2.00*	0.001	
Sundell G, 1990	Menarcheal age	Mean 12.7, SD 1.25	Mean 13.1, SD 1.4			0.002, <0.01*	Early menarche was related to an increase in the severity of dysmenorrhoea
Teperi J, 1989	Gynaecological age					<0.001*	

Andersch B, 1982	Early menarche					<0.01*	
Andersch, 1982	Menarche (years)	M 13.2, sd 1.3	M12.5, sd 1.3	0.7	-1.04 to -0.36	<0.0001	
Di Cintio, 1997	Duration of menstrual flow </= 4 days	26/106 (24.53)	71/145 (48.97)	0.36	0.18-0.7		*RR1
Di Cintio, 1997	Duration of menstrual flow 5 days	40/106 (37.74)	42/145 (28.97)	1.49	0.74-3		*RR2.2 (1.1-4.4)
Balbi, 2000	Duration of menses> 5 days	58%	17%			<0.05*	
Di Cintio, 1997	Duration of menstrual flow >/=6 days	40/106 (37.74)	32/145 (22.07)	1.38	0.65-2.91		*RR 1.9(0.9-4.1)
Di Cintio, 1997	Heavy menstrual blood loss	44/106 (41.51)	7/145 (4.83)	13.99	4.57-42.87		*RR 12.6 (5.0-32.1)
Sehgal, 1971	Heavy menstrual blood loss	40/172 (23.26)	20/212(9.43)	2.85	1.38-5.89		
Harlow S, 1996	Prolonged menstrual bleed (>7 days)			1.9*	1.29-2.80*		
Lee, 1991	Heavy menstrual					<0.001*	

	blood loss						
Hewison, 1996	Duration of menses	5.51+/-1.25	4.78+/-0.85	0.70	0.02-1.37		
Lee, 1991	Duration of menses					<0.005*	
Sundell G, 1990	Duration of menstrual flow	M5, sd 1.1 Mild dysmenorrhoea	M 5.0, sd 1.2	0.00	-0.29 to 0.29		Severity of dysmenorrhoea increased with increasing duration of menstruation, P<0.001*
Sundell G, 1990	Duration of menstrual flow	M 5.5, sd 1.1 Moderate dysmenorrhoea	M 5.0, sd 1.2	0.43	0.1 to 0.76		
Sundell G, 1990	Duration of menstrual flow	M 5.8, sd 1.8 Severe dysmenorrhoea	M 5.0, sd 1.2	0.59	0.14, 1.04		
Teperi J, 1989	Duration of menses					<0.001*	
Shaver, 1987	Duration of	4.92+/-1.22(N=55)	4.56+/-1.07 (N=98)	0.32	-0.12, 0.75		
Andersch, 1982	Duration of menstruation (days)	M 5.8, sd 1.4	M 5.0, sd 1.1	0.66	0.31, 1.00		
Di Cintio, 1997	Short menstrual cycles<25 days	10/106 (9.43)	22/145 (15.17)	0.58	0.26-1.29	0.25	*RR1
Di Cintio, 1997	Menstrual cycle 26-30 days	63/106 (59.43)	91/145 (62.76)	0.87	0.52-1.45	0.69	*RR2.0 (0.7-5.4)
Di Cintio, 1997	Menstrual cycle >31 days	14/106 (13.21)	19/145 (13.1)	1.01	0.48-2.12	1	*RR 2.6(0.8-8.6)

Di Cintio, 1997	Irregular menstrual cycles	19/106 (17.92)	10/145 (6.90)	2.95	1.31-6.6	0.01	*RR3.6 (1.0-13.4)
Sehgal, 1971	Irregular menstrual cycles	50/172 (29.07)	40/212 (18.87)	1.76	0.95-3.29		
Harlow S, 1996	Menstrual cycle length-21 days			0.73*	0.56-0.95*		
Harlow S, 1996	Menstrual cycle length-42 days			1.67*	1.09-2.55*		
Hewison, 1996	Length of menstrual cycle	29.26+/-5.39	27.48+/-6.32	1.45	-1.1 to 4.7	0.22	
Sundell G, 1990	Length of the cycle	M27.0, sd 4.0 Mild dysmenorrhoea	M 27.0, sd 3.6		-0.87 to 0.87	1	
Sundell G, 1990	Length of the cycle	M 27.7, sd 3.8 Moderate dysmenorrhoea	M 27.0, sd 3.6		-0.24 to 1.64	0.15	
Sundell G, 1990	Length of the cycle	M 27.6, sd 4.8 Severe dysmenorrhoea	M 27.0, sd 3.6		-0.76 to 1.96	0.4	
Pullon, 1988	Length of the cycle <25 days	57%	49%				2X2 table data not extractable
Shaver, 1987	Length of the cycle	28.7+/-3.1 (N=55)	28.3+/-8.9 (N=98)	0.05	-0.38, 0.49		
Andersch, 1982	Length of menstrual cycle (days)	M 27.2, sd 3.2	M 28.5, sd 5.1	-1.3	0.11 to 2.5	0.03	

Gordley, 2000	Fuel handling	26/53 (49.1)	40/117 (34.19)	1.86,1.83*	0.78-4.46, 0.90-3.70*	0.1*	Estimation of 2X2 data from the adjusted OR
Christiani, 1995	Occupational stress in cotton mills	139/404 (34.4)	49/249 (19.7)	2.05	1.3-3.24		
Messing K, 1993	Cold	293/320 (88.8)	279/340 (82.1)	2.27, 2.1**	1.26-4.10, 1.2-3.6**		Adjusted OR using multiple logistic regression models, environmental variable compared with absence of these factors
Mergler D, 1985	Cold	134/178 (75.28)	21/34 (61.8)	1.98	0.67-5.87		Compared to feeling comfortable or warm
Messing K, 1993	1or 2 of cold/drafty/humid			2.0**	1.2-3.4**	<0.001*	2X2 data not extractable
Messing K, 1993	Cold, drafty and humid			4.2**	2.2-8.0**	<0.001*	* Adjusted OR using multiple logistic regression models, environmental variable compared with absence of these factors
Messing K, 1993	Effort exerted, either arm	129/335 (38.5)	107/362 (29.56)	1.4**	1.0-2.0**	0.02	
Messing K, 1993	Unable to leave position freely at work			1.4**	0.9-2.2**	0.01	OR for leaving position only when replaced is 1.2 (0.8-1.7)
Messing K, 1993	Cannery workers	55%	46%	1.3**	0.8-1.9**		Compared to slaughterhouse workers
Mergler D, 1985	Slaughterhouse worker	156/213 (73.24)	55/105 (52.38)	2.54	1.33-4.86		

Messing K, 1993	3 or fewer breaks/day	278/345 (80.6)	280/370 (75.7)	1.33 1.7*	0.84-2.12, 1.2-2.5*		Compared with 4 or more breaks
Messing K, 1993	Irregular beginning of work day			1.5*	1.1-4.3*		
Messing K, 1993	Work always needing full attention			1.4*	1.0-1.9*		Compared with rarely/never
Runtz, 2002	Childhood sexual abuse	47.6, sd 30.5(n=143)	40.2, sd 26.8 (n=627)			0.007	
Jamieson DJ, 1997	Childhood sexual abuse			1.63*	0.83-3.21*	0.003*	
Runtz, 2002	Childhood physical abuse	54.9, sd 31.9 (n=152)	38.5, sd 25.6 (n-618)			0.00001	
Golding, 1998	Sexual assault [I] LA ECA	105/401(26.18)	176/1027 (17.13)	1.77	1.21-2.59		* Unadjusted OR as given by authors 1.7*
Golding, 1998	Sexual assault NCECA	28/493(5.68)	35/1210 (2.9)	2.19	1.05-4.53		2.1*
Golding, 1998	Sexual assault NSHLEW	174/441 (39.46)	155/579(26.77)	1.53	1.08-2.17		1.5*, Weighted M 1.73 (1.39-2.15)*
Jamieson DJ, 1997	Adulthood sexual abuse			0.86*	0.45-1.65*	NS*	
Pawlowski, 2004	Number of pregnancies	3.9+/-2.4 (n=50)	4.38+/-2.8 (n=127)			0.29	
Skierska, 1996	Nulligravidity	334/545(61.28)	81/189 (42.86)	2.11	1.36-3.28		

Walvaren, 2002	Nulliparity	39/85	143/522	2.41	1.25-4.65		
Mishra, 2000	Nulliparity	5242/5722 (91.6)	7831/8822 (88.76)	1.37	1.18-1.58		
Di Cintio, 1997	Nulliparity	83/106 (78.3)	101/145 (69.66)	1.55	0.74-3.26		
Messing K, 1993	Nulliparity	99/349 (28.37)	76/376 (20.2)	1.56	1-2.44		Compared with parity>0
Sundell G, 1990	Nulliparity	167/207 (80.68)	79/106 (74.53)	1.44	0.68-3.04		Compared to women who had never been pregnant or had an abortion or miscarriage, significant reduction (P<0.05) in dysmenorrhoea seen in women who were parous in 1986 but nulliparous in 1981
Wood, 1979	Nulliparity	110/170 (64.71)	293/499 (58.72)	1.28	0.80-2.05		
Andersch B, 1982	Parity					<0.01*	Parous women had significantly less dysmenorrhoea than nulliparous women
Robinson J, 1991	Parity >/=1	86/245 (35.1)	14/63 (22.2)	1.80	0.83-3.9		
Mishra, 2000	Parity >2	(32.3)	(40.1)	0.7*	0.6-0.9*		
Di Cintio, 1997	Parity >/=2	6/106 (5.66)	10/145 (6.90)	0.81	0.21-3.12		*RR 0.7(0.2-2.3)
Mishra, 2000	Miscarriages>/=1	266/5736 (4.64)	316/8695 (3.63)	1.3	1.04-1.62		

Di Cintio, 1997	Induced abortion>/=1	4/106 (3.77)	7/145 (4.83)	0.66	0.25-1.74		* RR 0.4 (0.1-1.9)
Di Cintio, 1997	Missed miscarriages>/=1	7/106 (6.60)	15/145 (10.34)	0.61	0.24-1.56		
Sundell G, 1990	Abortion or miscarriage	22/33 (66.67)	75/154 (48.7)	2.05	0.76-5.49		
Holmlund, 1999	Abortion or miscarriage	16/33 (47%)	14/33 (37%)	1.27	0.36-4.50		
Pawlowski, 2004	BMI	27.8+/-5.21(n=50)	29.3+/-4.16 (n=127)			0.04	
Hirata, 2002	Low BMI	296/778 (38.1%)	498/1504 (33.1%)	1.24	0.98-1.58		
Mishra, 2000	Low BMI (<18.5)	722/4075 (17.72)	768/6120 (12.55)	1.51, 1.4*	1.31-1.75, 1.2-1.8*		
Di Cintio, 1997	Low BMI <20	48/106 (45.28)	65/145 (44.83)	1.02	0.53-1.97		
Montero, 1996	Slimming with medium BMI	232/564 (41.13)	112/337 (33.23)	1.4	1.06-1.86	0.02	
Messing, 1993	Weight/height <10th percentile	39/316 (12.34%)	29/331(8.76%)	1.46	0.76-2.83		
Hirata, 2002	High BMI	95/778 (12.2)	165/1504(10.97)	1.13	0.79-1.62		
Mishra, 2000	High BMI (>25)	1134/4487 (25.27)	1697/7049 (24.07)	1.07, 1.0*	0.96-1.19, 0.9-1.2*		
Harlow S, 1996	Overweight			1.74*	0.72-4.2*		90th centile of weight for height

Messing, 1993	Weight/height >90th percentile)	33/340 (9.71%)	42/314 (13.4%)	0.7	0.37-1.31		
Andersch, 1982	Height (cm)	M 166.9, sd 6.3	M 167.2, sd 6.0	MD –0.05	-0.28 to 0.19		Severity of dysmenorrhoea not affected by height, weight
Sundell G, 1990	Height (cm)	M 168.1, sd 5.7 Mild dysmenorrhoea	M 166.3, sd 5.6	0.32	0.03 to 0.61		
Sundell G, 1990	Height (cm)	M 167.3, sd 6.0 Moderate dysmenorrhoea	M 166.3, sd 5.6	0.17	-0.15 to 0.5		
Sundell G, 1990	Height (cm)	M 168.3, sd 5.3 Severe dysmenorrhoea	M 166.3, sd 5.6	0.36	-0.07 to 0.79		
Sundell G, 1990	Weight (kg)	M 59.8, sd 6.9 Mild dysmenorrhoea	M 59.0, sd 9.0	0.1	-0.19, 0.39		
Sundell G, 1990	Weight (kg)	M 60.4, sd 8.0 Moderate dysmenorrhoea	M 59.0, sd 9.0	0.16	-0.16, 0.49		
Sundell G, 1990	Weight (kg)	M 60.3, sd 9.5 Severe dysmenorrhoea	M 59.0, sd 9.0	0.14	-0.29, 0.58		
Andersch, 1982	Weight (kg)	M 57.7, sd 7	M 58.3, sd 7.3	0.08	-0.26, .42		
Andersch B, 1982	Heredity					<0.01*	Dysmenorrhoea was significantly correlated to

							mother and sister's dysmenorrhoea
Widholm O, 1971	Maternal dysmenorrhoea					<0.001*	Daughters of mothers with dysmenorrhoea suffered from this symptom more often
Wu D, 2000	CYP2D6 polymorphism (Occasional dysmenorrhoea)	16/70 (22.9)	76/306 (24.8)	0.9	0.41-1.99		
Wu D, 2000	CYP2D6 polymorphism (Recurrent dysmenorrhoea)	21/59 (35.59)	76/306 (24.84)	1.73	0.76-3.97		
Wu D, 2000	Glutathione S transferase mutation absent (Occasional dysmenorrhoea)	36/66 (54.55)	163/306 (53.23)	1.01	0.5-2.04		
Wu D, 2000	Glutathione S transferase mutation absent (Recurrent dysmenorrhoea)	38/57 (66.67)	163/300 (54.33)	1.65, 1.8*	0.78-3.49, 1-3.4*	0.12	Crude OR of severe dysmenorrhoea in women with variant genotype of CYP2D6 was 2.7(95% CI 1.1-7.0), *adjusted association
El-Defrawi, 2001	Circumcision	161/189 (85.19)	39/61(63.93)	3.75	1.46-9.67		
Balbi, 2000	Egg intake	1.34+/-1.17	2.27+/-1.11		0.59-1.27	<0.0001	

Di Cintio, 1997	Dietary intake of 1egg per week			1.4*	0.6-3.2*		RR compared to those who did not eat eggs
Di Cintio, 1997	Dietary intake of >/=2 eggs per week			2.3*	1.0-5.4*		* RR compared to those who did not eat eggs
Montero, 1996	Slimming with strong BMI	67/75 (89.33)	27/40 (67.5)	4.03	1.50-10.83	0.009	
Montero, 1996	Dieting					0.0003*	Dieting is associated with menstrual pain
Balbi, 2000	Fruit	4.72+/-4.14	6.54+/-3.71		0.63-3.0	0.003	
Balbi, 2000	Pasta	6.69+/-2.57	6.04+/-2.82		-0.11-1.4	0.09	
Balbi, 2000	Meat	4.03+/-1.79	4.11+/-1.9		-0.4-0.6	0.8	
Balbi, 2000	Fish	1.59+/-1.26	2.31+/-1.52		0.34-1.4	0.0002	
Balbi, 2000	Wine	0.39+/-1.28	0.19+/-0.69		-0.15-0.55	0.26	
Deutch B, 1995	Saturated fat (g)	33.1	37			0.03*	
Deutch B, 1995	n-3PUFA (g)	1.97	2.42			0.03*	Higher intake of marine n-3 fatty acids (fish) correlates with milder menstrual symptoms
Deutch B, 1995	n-6 PUFA (g)	12.9	12.3			0.55*	
Deutch B, 1995	Cholesterol (mg)	327	384			0.09*	

Deutch B, 1995	Vitamin B12 (mcg)	3.7	5.9			0.00*	
Deutch B, 1995	Vitamin D (mcg)	3.7	5.9			0.03*	
Deutch B, 1995	Fibre (g)	2.6	3.8			0.01*	
Deutch B, 1995	Carbohydrate (g)	304	285			0.01*	
Pawlowski, 2004	Age at birth of first child	21.1+/-3.3 (n=50)	19.4+/-3.6 (n=127)			0.004	
Harlow S, 1996	Living away from home			0.67*	0.5-0.89*		
Holmlund, 1991	Somatization	M 9.2, sd 7.3	M 5.8, sd 5.5	0.55	-0.25, 1.34		
Holmlund, 1991	Anxiety	12.7, sd 10.6	7.1, sd 10.6	0.55	-0.25, 1.35		
Alonso C, 2001	Anxiety or depression					<0.01*	Data not given for 2X2 tables
Hirt, 1967	Anxiety					<0.05*	
Waller, 1995	Depression				1.0-8.0	0.01	Control group with no pain but infertility, with minimal-mild endometriosis on laparoscopy
Waller, 1995	Depression				2.0-8.0	0.002	Control group with no pain and normal pelvis on laparoscopy
Holmlund,	Depression	M15.3, sd 17.4	M 7.3, sd 9.1	0.64	-0.17, 1.44		

1991 Alonso, 2001	Social support					<0.02*	Women with more disruptions in the social networks experienced more painful symptoms than women with stable support over the preceding year
Wood, 1979	Emotional difficulties	158/283 (55.83)	141/386(36.53)	2.19	1.61-3.00	<0.0001	
Wood, 1979	Suicidal tendency	84/132 (63.64)	222/537 (41.34)	2.48	1.67-3.68	<0.0001	66% of women who had often considered suicide had menstrual pain in contrast to 41% who had never considered suicide
Waller, 1995	Nonsensuality	M 6.2, sd 1.88	M 3.79, sd 2.22	1.15	0.62, 1.67	<0.02*	
Waller, 1995	Vaginismus	M 4.32, sd 2.09	M 2.94, sd 2.07	0.66	0.16, 1.16	0.02*	
Holmlund U, 1990	Neurotic self-assertiveness						Higher mean value in dysmenorrhoea group
Holmlund U, 1990	Masculinity						No important intergroup differences, women with severe dysmenorrhoea, scored significantly lower in masculinity
Wood, 1978	Neuroticism					<0.001*	Neuroticism more common in prolonged and painful menses
Hirt, 1967	Neuroticism					<0.05*	

Wood, 1978	Psychiatric diagnoses					<0.05*	Dysmenorrhoea significantly more common in patients with psychiatric diagnoses but not in those with physical diagnoses
Sehgal, 1971	Psychological symptoms (hysteria, extreme changes in mood, suicidal tendency)	98/132 (74.24)	88/212 (41.51)				
Skierska, 1996	Premenstrual syndrome	193/415 (46.51)	103/319 (32.29)	1.8, 1.96*	1.22-2.67, 1.44-2.68*		
Jarrett, 1995	Premenstrual symptoms (bloating +backache)	1.05+_/-0.75	0.34+/-0.5	1.13	0.41, 1.84	<0.001*	
Freeman, 1993	Premenstrual syndrome	M 4.1, sd 1	M 3.7, sd 0.8	0.47	-0.1, 1.04		
Pullon, 1988	Premenstrual syndrome						mild or very mild PMS had lower prevalence (51-45% and significant period pain from 31-33%) than women in the moderate to very severe categories with prevalence of 59-61% and significant period pain from 37-43%
Shaver, 1987	Premenstrual symptoms (bloating,	41/55	51/98	1.88	0.76, 4.66		

	backache)						
Sehgal, 1971	Premenstrual symptoms	88/172(51.16)	44/212 (20.75)	3.84	2.2, 6.7		
Freeman, 1993	Ongoing symptoms	M 4.3, sd 1.2	M 3.7, sd 0.8	0.67	0.09, 1.24		
Gomibuchi, 1993	Extraggression trait (Extraggression is type of personality where complaints are directed toward the surrounding environment)	M 36.6, SD 13.6%	M 29.3, SD 5.3%	0.56	-0.49, 1.6		Percentage of extraggression personality in women without dysmenorrhoea was significantly lower compared with that of women with dysmenorrhoea.
Gomibuchi, 1993	Obstacle dominance – the barrier that causes the frustration to stand and thus a solution to the problem is seldom attempted out in the response)	M 3.4, sd 1.6	M 2.1, sd 1	0.83	-0.23, 1.89		
Gomibuchi, 1993	Ego defense- the organising capacity of the subject predominates to defend its integrity	M 4.6, sd 2.7	M 2.8, sd 1.2		-0.36, 1.74		
Gomibuchi, 1993	Need persistence- the solution of the problem is emphasized by pursuing the goal	M 2.1, sd 1.6	M 2.1, sd 1.3		-1.2-1.2	0.5	

Bukman, 1990	despite the obstacle Involuntary infertility	19/37 (51.35)	16/39(41.02)	1.51	0.46-4.90		No difference in prevalence and severity of dysmenorrhoea in infertile women compared with voluntarily infertile women
Mishra, 2000	Marriage/ de facto	1272/5817 (21.87)	2048/8880 (23.06)	0.93, 0.9*	0.84-1.04, 0.9-1.0*		
Di Cintio, 1997	Marriage	47/106 (44)	65/145 (45)	0.98	0.51-1.90		
Messing, 1993	Marriage/ living with partner	71/373 (19.0)	80/341 (23.5)	0.77	0.48-1.23		
Wood, 1979	Marriage	207/498 (41.57)	99/171 (57.89)	0.52	0.33-0.82	<0.002*	
Mishra, 2000	Education <10 years	191/5807 (3.29)	244/8859 (2.75)	1.2	0.93-1.55		
Di Cintio, 1997	Education <12 years	43/106 (40.57)	47/145 (32.41)	1.42	0.72-2.82		
Wood, 1979	Employment	177/374(47)	126/288 (43.8)	1.15	0.87-1.57	0.4	
Jamieson, 1997	Lower income	96%	89%			0.01*	<$25000 is lower income group
Klein J, 1981	High Socio-economic status	518/1876 (27.61)	304/1371 (22.17)	1.33	1.08-1.65		
Widholm O, 1971	High Social group (Daughters)	111/217 (51.15)	623/1218 (51.15)	1	0.68-1.46		Incidence of dysmenorrhoea constant with different social groups in girls
Widholm O,	High Social group	65/185 (35.14)	884/1961(45.08)	0.67	0.45-1.00		Dysmenorrhoea increases

1971	(Mothers)						in mothers with lower social class
Gordley, 2000	Life events			2.2*	1.08-4.5*	<0.05*	
Gordley, 2000	Caucasian race	33/53 (62.3%)	71/117 (60.7%)	0.93	0.39-2.21		
Lee, 1991	Caucasian race	290/313 (92.65)	218/258 (84.49)	2.29	1.15-4.57		Compared to black and Asian women
Stambolov, 1989	PID	54/224 (24.10)	8/100 (8)	2.82	1.29-6.20		P<0.05*
Heisterberg, 1993	Previous PID	97/612 (15.85%)	76/617 (12.32%)	1.34, 1.35*	0.88-2.04, 0.93-1.96*		Approximate estimation of 2X2 table from available data

Di Wu et al, 2000- Women with variant genotypes in both CYP2D6 and GSTM1 appeared to be at highest risk of dysmenorrhoea (OR 3.1, 95%cI 1.2-8.0), there was no appreciable association between these variant genotypes and occasional dysmenorrhoea

i- Sexual assault defined as sexual contact occurring before the age of 18 that were unwanted by the respondent and those occurring before age 13 that involved another person at least 5 years older than the respondent. Adult sexual assault assessed by referring to unwanted sexual experiences at or after age 18

Appendix 3.8: Table of characteristics of studies included in systematic review on risk factors for dyspareunia

No.	Authors, country, language and year	No. of women analysed (Cases versus controls)	Population characteristics and response rate where stated	Risk factors studied	Definition of case	Definition of control	Follow-up (months) After exposure
1.	Cain VS, USA, English, 2003	2406	SWAN is a national study of mid-life women conducted in two phases at 7 US sites. Women age 42-52 either Caucasian or site-designated other ethnicity, having menses within the previous 3 months, having an intact uterus and at least one ovary, no use of medications affecting reproductive hormones within the previous 3 months. 5 women who responded that they never had sex but reported having intercourse in the last 6 months were excluded from the analyses. Analyses was limited to women who had sex in the last 6 months	Perimenopausal status African-American race	Pain during intercourse in the last 6 months	No pain during intercourse	Not stated
2.	Danaci, Turkey, English, 2003	324	40-60 years old women who attended the GOPD of Celal Bayar university hospital were recruited, exclusion criteria were: having a gynecologic disorder, chronic medical disorder, surgical menopause, psychiatric	Perimenopausal status	Painful intercourse in the last 6 months	Intercourse not painful	Undefined

			disorder, using HRT and being illiterate. Women were divided into 3 groups according to their menopausal status: those with regular menses were premenopausal, those with irregular menses in the last year were perimenopausal and those with no menses in the last year were postmenopausal, 90% response rate				
3.	Danielsson, Sweden, English, 2003	3017 (281 vs. 2736)	Between December 1998-April 1999, all 20-60 years old women who participated in the screening programme for cervical cancer in a mixed but chiefly urban region in Sweden were asked to answer a short questionnaire after oral consent was obtained, 7 women who never had sexual intercourse were omitted as were women who did not understand the written language, 96% response rate	Age<50 years	Dyspareunia that had lasted at least 6 months	No dyspareunia	Not stated
4.	Okonfua, Nigeria, English, 2002	1828 (53 vs. 1775)	Study was conducted in Edo state among women attending antenatal clinics in Bennin city and Irrua between Aug 1998-March 1999and 20-40 weeks of pregnancy, full consent taken	Female circumcision	Recurrent pain during intercourse	No pain during intercourse	All underwent examination (laparoscopy not stated)
5.	Dennerstein, Australia, English, 2001	438	Study began in 1991 with population sampling by random telephone digital dialling and baseline interview of 2001 Australian born women between 45-55 years and resident in Melbourne. All those women at baseline who had experienced menses in the prior 3	Menopause	Pain during intercourse	No pain during intercourse	Not stated

			months and who were not taking HRT were invited to participate, 37% had more than 12 years education and median parity was 3, 81% of women were married or living with a partner for 1 year, 56.5% response rate				
6.	El-Defrawi, Egypt, English, 2001	250 (108vs. 142)	Patients of maternal and childhood centre, Islamia, 87% acceptance rate and >95% follow up rate	Circumcision	Undefined	No pelvic pain	Undefined
7.	Zhao G, China, English, 2000	773(158vs.615)	41-6- years old 402 professional urban women and 404 farmers from rural area out of whom 29.2% were illiterate, mean age at menopause 47.3+/-4.6 years, 1.1% of the women used HRT and they all lived in the city	Postmenopausal status	Uncomfortable intercourse	No dyspareunia	Undefined
8.	Dunn, UK, English, 1999	979	18-75 years old women randomly selected from four GP practices diverse in their geographical location and urbanisation	Age Marital difficulties Depression Anxiety	Undefined	No dyspareunia	Undefined
9.	Laumann, USA, English, 1999	18-59	The national health and social life survey conducted in 1992 is national probability sample of 1410 men and 1749 women between the ages of 18 and 59 years living in households throughout the USA, only those respondents who had a partner in the last 12 months were analysed. Excluded women tended to be older and single.	Age <50 years	Painful intercourse	No dyspareunia	Undefined
10.	Collett B, UK, English, 1998	90	16-50 years old, 30.1 vs. 33.6 and 30.4 years old women married for 14-21	Childhood / Adulthood sexual	Noncyclic pelvic pain and	No pain or other chronic pain at	Undefined, 10/30 cases had

			years with 0-2 children, 12.2-12.6 years in education attending Leicester Pelvic pain clinic, comparison pain group was from referrals to pain management clinic and pain free women were randomly selected from two GP surgeries	abuse Physical abuse Depression and anxiety	dyspareunia	other site (backache or headache)	negative laparoscopy, 10 women had diagnosis of PID and others had ovarian cyst or endometriosis
11.	Golding, USA, English, 1998	1428-LCECA 1703-NCECA 960-NSHLW	Mean age 42.3 years, SE 0.5 Los Angeles Epidemiologic Catchment Area (LAECA) study- 44.4% latina, 44.2% European American and 11.4% other groups, mean education11.5 years, latino residents were interviewed in English or Spanish according to their preference, 68% acceptance rate and 86% follow up rate Second group -mean 43.9 years, SE 0.7North Carolina Epidemiologic Catchment Area (NCECA) study-38.2% African American, 60.3% European American, 1.4% other groups, 11.8 years mean education, sample selected to represent adults in 2 mental catchment areas in North Carolina, Durham county and 4 other rural counties-79% acceptance rate Third group-National Study of Health and Life Experiences of Women (NSHLEW) participants who gave informed consent, 9.7% African American, 84.3% European American and 6% other groups with mean education 12.8 years, 76% acceptance rate and 91% follow up rate	Sexual assault	Physical pain during sexual relation or not pleasurable sexual relations for many months	No pain	Undefined

12.	Gurel SA, Turkey, English, 1997	136 (111vs. 25)	31.5-43.7 years, average marriage period 10-27years, 80.3%uneducated in grandmultipara, 23.4% uneducated in non-grandmultipara, grandmultipara had less antenatal care and more home delivery	Grandmultiparity	Dyspareunia and postcoital pain	No coital or post coital pain	Undefined
13.	Jamieson D, USA, English, 1997	581	Between Feb-April 1993, questionnaires were administered to 18-45 years old women in five primary care practices in North Carolina (2 O&G and 3 family medicine), both patients and non patients who were not pregnant were approached, 35 incomplete questionnaires were excluded as were 14 for race other than African-American or white, 14 widowed women and 42 women with missing marital status data were excluded, 83% response rate	Sexual abuse African American race Lower income	Pain during/after intercourse	No pain associated with intercourse	Undefined
14.	Heisterberg, Denmark, English, 1993	1229	14-45 years age, pregnant women referred to the O&G department, university of Copenhagen for delivery or induced first trimester abortion	Previous pelvic inflammatory disease (PID)	Undefined	No dyspareunia	
15.	Moody G, UK, English, 1993	78	37.8+/-12.9 vs. 38.5+/-12.2 years, on community database for inflammatory bowel disease database in Leicestershire, 63% acceptance rate, mean duration of marriage 19.8 vs. 18.7 years	Ulcerative colitis	Pain severe enough to interfere with sexual intercourse	No pain during sexual intercourse	Undefined
16.	Weber A, USA, English, 1995	62 (45 vs. 17)	8.2 vs. 49.2 years, para2-3, 14-17%blacks, 18-20% smokers, 60-75%	Prolapse	Genital pain or burning during	No genital pain	Undefined

			postmenopausal, 67% follow up		or after sexual activity		
17.	Chapman Dudley, USA, English, 1989	95	Between 1986 march to November1987, 11-81 years old women were asked to participate in the study, 60 women were recruited from rape crisis centre and control group from private gynecologic medical practice, 80% white, 13% Hispanic and 7% black, 71% acceptance rate	Sexual assault	pain during arousal or orgasm	No dyspareunia	20months
18.	Osborn, UK, English, 1988	409	Study was based on two oxford group practices with computerised age and sex registers which was used to select a random sample of 600, consisting of 100-150 women in each of five age bands of 35-59 years, of the respondents 436 women with male sexual partner were interviewed, 87% response rate	Age < 50 years	Pain or discomfort causing difficulties during sexual intercourse more than half of the time during the previous 3 months	No dyspareunia	Undefined
19.	Heisterberg, Denmark, English, 1986	493	Women who had participated in a clinical trial in 1978-79 of prophylactic antibiotics in preventing postabortal PID, all women were seen 4 weeks post abortion when pelvic examination was performed normal. 40 women were found to have postabortal PID according to the criteria of infection used in the study	Postabortal PID	Undefined	No dyspareunia	5-6 years

Appendix 3.9: Table of quality assessment of studies on risk factors for dyspareunia

No.	Authors, year	Study design	Recruitment of study subjects	Method of ascertainment of risk factor or exposure	Method of ascertainment of outcome	Temporality of association	Control for confounding	List of confounding factors	*Quality criteria satisfied
1.	Cain VS, 2003	Prospective, cohort	Random digit dialling, snowballing from patients etc.	Questionnaire-validated	Questionnaire	Not studied	Yes	Ethnicity, marital status, employment, ability to pay for the basics and education	4
2.	Danaci, 2003	Cross-sectional survey	Volunteers	Interview on sexual desire, behaviour, BDI and STAI	Examination and serum FSH, LH, progesterone, PRL and E2	Not studied	Yes	Marital status, occupational status, education level	4
3.	Danielsson, 2003	Cross-sectional survey	Consecutive	Structured questionnaire-validity not stated	Questionnaire	Not studied	Yes	Age, OC use	2
4.	Okonfua, 2002	Cross-sectional survey	Consecutive	Structured questionnaire-valid	Examination	Yes	Yes	Age, religion, ethnic group, education, husband's education, marital status, number of co-wives, age at	5

								first sex, frequency of sex in the last month and times pregnant at survey	
5.	Dennerstein, 2001	Prospective, cohort	Random	Personal experiences questionnaire-validated	Annual questionnaire and blood sampling	Yes	Yes	Study years on HRT and surgical menopause	6
6.	El-Defrawi, 2001	Blinded, cross-sectional survey	Random	Gynaecological examination followed by a semi structured psychiatric interview, validated based on Arabic version of the sexual behaviour assessment schedule-adult (SEBAS-A)	Questionnaire	Yes	No	None	5
7.	Zhao, 2000	Cross sectional	Not defined	Validated questionnaire	Hormonal assay	Not studied	No	None	2
8.	Dunn, 1999	Retrospective, cross sectional survey	Stratified random	Validated questionnaire	Questionnaire	Not studied	No	None	2
9.	Laumann, 1999	Retrospective, cross sectional survey	Random stratified	Validated questionnaire	Questionnaire	Not studied	Yes	Age, race, ethnicity, marital status,	3

								educational level	
10.	Collett B, 1998	Retrospective, case-control	Consecutive for cases and random for controls	Sexual life events inventory used by Palmer et al, Hospital Anxiety and Depression questionnaire and Somatisation scale by Reiter and Gambone	Laparoscopy for cases and questionnaires for controls	Yes for childhood sexual abuse	Yes	Age	5
11.	Golding, 1998	Cross sectional survey	Multistage area probability sampling from household residents >18 years old	Somatisation section of Diagnostic Interview schedule+ series of questions on lifetime sexual assault	Interview	Not stated	Yes	Age, ethnicity, education	3
12.	Gurel SA, 1997	Retrospective, case control	Not defined	Para 5 or more on history- valid method	Interview	Not stated	Yes	Parity, education, antenatal care, marriage period, place of delivery	2
13.	Jamieson DJ, 1997	Retrospective, cross-sectional survey	Consecutive	Validated questionnaire developed for the National Population Survey of Canada	Questionnaire	Yes for childhood sexual abuse	Yes	Age, parity, education, income, marital status, race	5

14.	Weber A, 1995	Retrospective, case control	Not defined	Baden walker scores with subject in gynae stirrups and with maximum straining effort	Current sexual history form	Not stated	Yes	Age, parity, BMI, race, smokers, current oestrogen use, postmenopausal status	3
15.	Heisterberg, 1993	Retrospective, cohort	Not defined	Questionnaire-? Valid	Questionnaire-validation not stated	Yes	Yes	Previous spontaneous abortions, number of induced abortions, previous PID, parity and age	3
16.	Moody, 1993	Retrospective, case-control	Every 10^{th} person on database	Validated questionnaire	Questionnaire	Not stated	Yes	Age, background	3
17.	Chapman Dudley, 1989	Retrospective, case-control	Not defined	Questionnaire-validation not stated	Questionnaire	Not stated	Yes	Age, education, religious practice, marital status, parity	1
18.	Osborn, 1988	Retrospective, cross-sectional survey	Random	Semi structured interview-validated	Interview	Not stated	No	None	2
19.	Heisterberg, 1986	Retrospective, case-control	Not defined	Questionnaire-? Valid	Questionnaire, hospital records and information from women's physician	Yes	No	None	3

*Indicates the number of quality items satisfied out of a total of six including prospective study design or blinding, consecutive recruitment of subjects or other appropriate method, adequate ascertainment of risk factor or exposure, adequate ascertainment of outcome, temporality of association and control for confounding.

Appendix 3.10: Table of results on risk factors for dyspareunia

Author, year	Risk factor/ Exposure	Exposed with dyspareunia (%)	Exposed without dyspareunia (%)	Measure of association- Odds ratio	95% Confidence interval	P value	Comments
Weber A, 1995	Prolapse	13/18 (72.22)	32/44 (72.72)	0.98	0.29-3.32	1	P<0.001
Gurel SA, 1997	Grandmultiparity	29/53 (54.72)	42 /83 (50.6)	1.18	0.59-2.35	0.77	
Okonfua, 2002	Circumcision	30/53 (56.6)	795/1775 (44.79)	1.61	0.93-2.79	0.11	
El-Defrawi, 2001	Circumcision	92/108 (85.19)	108/142 (76.06)	1.8	0.94-3.49	0.1	
Heisterberg, 1993	Age			0.99*	0.93-1.03*		
Danielsson, 2003	Age <50 years	341/417 (81.8)	1903/2600 (73.2)	1.64	1.26-2.14	0.0002	9 times higher incidence of severe dyspareunia in women aged 20-29 than in women aged 50-60 years*
Dunn, 1999	Age <50 years	88/115 (76.5%)	356/534 (66.67%)	1.63	1.02-2.6	0.05	
Laumann, 1999	Age <50 years	214/1279 (16.73)	16/200 (8)	1.94	1.13-3.34		
Osborn, 1988	Age <50 years	7/30 (23.3)	235/349 (67.33)	0.17	0.07-0.4	<0.0001	
Golding, 1998	Sexual Assault	114/394 (28.93)	132/1034 (12.77)	2.78	2.09-3.69	<0.0001	2.75*
Golding, 1998	Sexual Assault	34/305 (11.15)	53/1398 (3.79)	3.18	2.03-4.99	<0.0001	3.19*
Golding, 1998	Sexual Assault	190/538 (35.32)	89/425 (20.94)	2.06	1.54-2.76	<0.0001	2.12* Weighted mean 2.54

							(1.98-3.27)*, analyses by age groups did not result in markedly different conclusions
Collett B, 1998	Sexual abuse <16 years	6/30 (20)	2/30 (6.67) Other pain	3.5	0.65-18.98	0.25	
Collett B, 1998	Sexual abuse <16 years	6/30 (20)	4/30 (13.33) Pain free	1.63	0.41-6.47	0.73	
Dudley, 1989	Sexual Assault	30/33(90.9)	30/62(48.4)	6.1	2.6-14.6	<0.0001	
Collett B, 1998	Physical abuse	8/30 (26.67)	6/30 (20) Other pain	1.45	0.44-4.86	0.76	
Collett B, 1998	Physical abuse	8/30 (26.67)	8/30 (26.67) Pain free	1	0.32-3.11	1	
Heisterberg, 1986	Postabortal PID	6/21 (28.57)	24/317 (7.57)	4.88	1.74-13.74	0.004	
Jamieson DJ, 1997	Childhood sexual abuse			1.74*	0.92-3.29*	0.001*	
Jamieson DJ, 1997	Adulthood sexual abuse			2.55*	1.38-4.71*	<0.001*	
Cain VS, 2003	African-American race	25.1%	17.3% in Caucasians	1.29*	1.03-1.61**		2X2 data not extractable
Jamieson DJ, 1997	African-American race	84/270 (31.1%)	66/310 (21.3%)	1.67	1.15-2.43	0.01	
Jamieson DJ, 1997	Low income	54.9% incidence in lower income group	42.8% in higher income group			0.01	<$25000 is lower income group
Heisterberg, 1993	Previous PID	36/64	219/1156	5.28, 3.87*	3.19-8.85, 2.35-6.37*	<0.0001	2 x 2 computed from OR
Moody G, 1993	Ulcerative colitis	15/22 (68.18)	25/56 (44.64)	2.66	0.94-7.52	0.1	
Dunn, 1999	Marital difficulties/	28/107 (26.17%)	98/486 (20.16%)	1.4, 1.9*	0.86-2.28,	0.21	

	severely dissatisfied with relationship				1.0-3.5*		
Dunn, 1999	Anxiety (Score of 11 or more on HAD scale)	50/113 (44.25%)	116/532 (21.8%)	2.85, 2.8*	1.86-4.35, 1.8-4.3*	<0.0001	
Dunn, 1999	Depression	18/116 (15.51%)	21/534 (3.93%)	4.49,4.5*	2.30-8.73, 2.3-8.7*	<0.0001	
Cain, 2003	Perimenopausal status	280/508	834/1898	1.57	1.21-2.03	<0.001**	Compared to premenopausal group
Danaci, 2003	Perimenopausal status	24/58 (41.38)	60/142 (42.35)	0.96	0.43-2.17		
Dennerstein, 2001	Menopause					<0.01*	Studied from late perimenopause to postmenoapause
Zhao, 2000	Postmenopausal status	90/384 (23.44)	68/422 (16.11)	1.54	1.01-2.57		

PID- pelvic inflammatory disease
*- Figures given by authors as unadjusted odds ratio, 2X 2 tables worked out approximately from the given odds ratio

Appendix 3.11: Table of characteristics of studies included in the systematic review with outcome as noncyclical pelvic pain

No.	Authors, country, language and year	Women analysed (Cases versus controls)	Population characteristics and response rate where stated	Risk factor	Definition of case	Definition of control	Follow-up (months) after exposure / [Number with organic pathology]/ who had examination laparoscopy]
1	Lampe A, Austria, English, 2003	105 (43 vs. 40 and 22)	18-60 years old women attending OPD of Gynaecology and Orthopaedics of the university of Innsbruck, Austria, sufficient knowledge of German language, given written informed consent	Childhood sexual and physical abuse Severe stressful life events Depression	Pelvic pain lasting longer than 6 months	Chronic low backache or pain free	Not defined
2	Almeida ECS, Brazil, English, 2002	199 (116 vs. 83)	19-52 years old womens' case notes of women consecutively admitted between Jan 1998-2000 who underwent laparoscopy were studied-mean age 34.2 years vs. 36 years, gravidity 2 vs. 4, 80% vs. 76% white	Caesarean section Pelvic adhesions Endometriosis PID Leiomyomas Pelvic varices Gravidity	Pelvic pain undefined	Pain free	All underwent laparoscopy

3	Okonfua, Nigeria, English, 2002	1828 (246 vs. 1582)	Study was conducted in Edo state among women attending antenatal clinics in Bennin city and Irrua between Aug 1998-March 1999and 20-40 weeks of pregnancy, full consent taken	Female circumcision	Low abdominal pain undefined	No Low abdominal pain	All underwent examination (laparoscopy not stated)
4	Runtz, Canada, English, 2002	770	17-56 (median age 18 years) years old women enrolled in psychology at a medium size western Canadian university who volunteered for a study of women's health concerns were eligible to participate, 93% single, 89% in the first or second year of university, of European descent (85%), 51% identified social sciences or education as their field of study, 77% raised by both biological parents in intact families	Childhood sexual and/or physical abuse	Pelvic pain undefined	Pain free	No details of laparoscopy available
5	Bodden-heidrich, Germany, German, 2001	140 (106 vs. 34)	Age 34-38 years, undefined ethnicity, parity and varying level of education	Nervousness Depression Emotional lability Sexual abuse Orthopaedic problems	Chronic pelvic pain syndrome>/= 6 months	No pain attending for breast and cervical screening	Not defined [26% endometriosis, 20% adhesions, 12% cysts, 2% PID, 1% irritable bowel syndrome, 2% cysts and adhesions, 38% without organ diagnosis]

6	Erickson, USA, English, 2001	72 (36 vs. 36)	White females with interstitial cystitis and age matched female controls including 32 white and 3 Asian were recruited, >95% follow up	Interstitial cystitis	Pelvic discomfort other than urinary symptoms	Women without pelvic discomfort	Not defined
7	Lampe A, Austria, English, 2000	79 (36 vs. 23, 36 vs. 20)	32+/-8.8 vs. 41+/-8.1 and 29+/-8.1 years, 18-60 years old German speaking women who visited the Department of gynaecology of the Innsbruck University Hospital and signed written consent were included, 32.4%in pain group, 8.7% in low backache group and 30% in the control group from upper middle class	Sexual, physical abuse Childhood sexual abuse Psychological abuse	Pelvic pain for more than 6 months	Women with low back pain attending orthopaedic clinic, second comparative group were women with no pain attending GP surgery for routine check up	Not stated, all had USS and laparoscopy (number with organic pathology not stated)
8	Bodden-heidrich, Germany, English, 1999	142 (106 vs. 36)	Age 34-38 years, varying level of education, undefined ethnicity and parity, varying level of education	Alcoholism in 1 parent Parents divorced or death of 1 parent <16 yrs age Sexual abuse Borderline syndrome Conversion neurosis	Chronic pelvic pain syndrome>/= 6 months	Chronic vulval pain syndrome	Not defined [26% endometriosis, 20% adhesions, 12% cysts, 2% PID, 1% irritable bowel syndrome, 2% cysts and adhesions, 38% without organ diagnosis]

9	Ehlert, Germany, English, 1999	40 (26 vs. 14)	Mean age 28.3years vs. 30.1 years, Participants were referred to the gynaecological dept. of a general hospital (Herz-Jesu Krankenhaus Trier, Germany) for diagnostic laparoscopy during the early follicular phase of the menstrual cycle, none used oral contraceptives or other hormonal medication or suffered from severe medical illness	Somatisation Sexual abuse Physical abuse Critical life events Post traumatic stress disorder	Noncyclic pelvic pain for at least 4 months	Pain free (but infertile)	All underwent laparoscopy
10	Green C, USA, English, 1999	90	Mean age 46.4 +/- 15.5 years, English speaking women attending multidisciplinary pain centre at the University of Michigan medical centre were approached, 16% single, 51% married, 10% widowed and 22% divorced/ separated, 82% Caucasians, 14% African American and 4% other categories, 87% response rate	Physical and sexual abuse	Pelvic pain undefined	Other pain (headache, backache, stomach ache)	All had examination (number who underwent laparoscopy not stated)

11	Tong, China, Chinese, 1999	2000 (55 vs. 1945)	27.4+/-6.3 vs. 27.1+/-5.9 years, women in the two groups comparable for age, menstrual history (30.6 vs. 30.9 days, duration of menstruation 5.4 days), >95% follow up, control group were women who had spontaneous vaginal delivery	Caesarean section	Chronic pelvic pain undefined	No pelvic pain	Follow up after 24 months after caesarean section, number who had laparoscopy or pathology not stated
12	Collett, UK, English, 1998	90 (30 vs. 30 and 30)	16-50 years old women married for 14-21 years with 0-2 children, spent 12.2-12.6 years in education, attending Leicester Pelvic pain clinic, comparison pain group was from referrals to pain management clinic and pain free women were randomly selected from two GP surgeries	Sexual abuse	Pelvic pain (or dyspareunia) more than 6 months	Pain free or pain at other sites than pelvis over 6 months (backache or headache, few had complex pain syndrome)	12 months, all women with pelvic pain had laparoscopy, 10/30 cases had negative laparoscopy, 10 women had diagnosis of PID and others had ovarian cyst or endometriosis
13	Gurel SA, Turkey, English, 1997	136 (111 vs. 25)	31.5-43.7 years old, average marriage period 10-27years, 80.3% uneducated in grandmultipara group (with less antenatal care and more home delivery) vs. 23.4% in non-grandmultipara	Grandmultiparity (Para 5 or more)	Pelvic pain longer than 6 months	No pelvic pain	Not stated, [not looked for]

14	Jamieson DJ, 1997, English, USA	581	18-45 year old women in waiting areas of five primary practices in North Carolina were approached, 83% response rate	Sexual abuse	Low abdominal pain often/always besides when menstruating	No pain in lower abdomen always/often	Undefined, number of women who were investigated undefined
15	Thornton JG, UK, English, 1997	237 (132vs. 105)	Age not defined, women undergoing laparoscopy for pelvic pain, infertility or sterilisation were studied	Endometriosis Adhesions Dilated veins> 9 mm	Pelvic pain > 3 months	No pelvic pain, undergoing sterilisation or investigation for infertility	Not stated, 100% of cases had laparoscopy
16	Dellenbach, France, French, 1996	70 (40 &20 vs. 10)	Mean 35+/-8.9 and mean 34+/-7.9 versus 41+/-8 years, verbal IQ of cases 90.25 and 99.25 versus 102 in controls, 35%second grade schooling in cases vs. 40% in controls	Unsatisfactory relationship with spouse/boyfriend Parity Disturbed puberty Disturbed sexuality Psychoses, neuroses	Chronic pelvic pain more than 6 months and negative laparoscopy, second group of chronic pelvic pain more than 6 months with organic cause	No pelvic pain	Not stated, all cases had laparoscopy (20/60 with organic cause)
17	Hodgkiss, UK, English, 1994	62 (29 vs. 33)	Patients admitted to Guy's and Lewisham hospital for elective laparoscopy between April and November 1990 included, 98% response rate, written consent given	Marriage Employment Low social class Depression Anxiety Somatization	Pain in the lower abdomen of at least 6 months duration including deep dyspareunia	Pain free	All underwent laparoscopy (11/29 of cases were lap. Positive)

18	Walling M, USA, English, 1994	152 (64 vs. 42 and 46)	29.44 +/-5.55 vs. 29.98+/-7.72 and 34.74+/-6.69 years, cases from multidisciplinary pain clinic with mean education of 13.19 years, controls from head and neck clinic and second control group was without gynaecological symptoms who attended for routine examination, 87.70% acceptance rate and 66.70% follow up rate	Childhood sexual abuse Lifetime sexual abuse Marriage Employment Depression Anxiety Physical symptoms	Noncyclical pelvic pain of more than 6 months duration and laparoscopy negative	No pelvic pain but persistent headache for >6 months excluding migraine, other control group-healthy women with no pain	Not stated, 100% of cases were laparoscopy negative
19	Heisterberg, Denmark, English, 1993	1229	14-45 years old pregnant women referred to the O&G department, university of Copenhagen for delivery or induced first trimester abortion	PID	Pelvic pain undefined	No pelvic pain	
20	Kirkengen, Norway, English, 1993	85 (63 vs. 22)	20-49 years old patients were recruited in a single general practice in Oslo, Norway, 24 came on emergency days and 9 had poor knowledge of Norwegian and were excluded and 117 were asked to participate, 73% acceptance rate and >95% follow up rate	Childhood sexual abuse	Pelvic pain undefined	No pelvic pain	Undefined, cases who had evaluation or laparoscopy not stated

21	Rulin MC, USA, English, 1993	966 (500 vs.466)	Mean 28 vs. 27 years, low income, ethnically and regionally diverse women from three participating institutions, women taking OC (147) in the control group were excluded from analysis, modified Pomeroy technique used for puerperal sterilisation, interval sterilisation was done by falope bands or bipolar electrocautery, >95% follow up	Sterilisation	Severe noncyclical pain undefined	No noncyclical pain	3-4.5 yrs
22	Springs FE, USA, English, 1992	551	18-50 years old women using family practice clinic in rural Midwestern community between 1988-89, mean age 35.6+/-8.4yrs, 35.2% high school education, 22.6% having annual income of 35000 to 450000$ and 81.4% married, 93% follow up	Sexual abuse	Pelvic pain not defined	No pelvic pain	Not stated, examination only
23	Walker EA, USA, English, 1992	43 (22 vs. 21)	Mean age 27.6(SD 7.7) in cases vs. 31.2yrs (SD7.8) in controls, Hollingsworth social class 4(SD1) vs. 3.4 (SD 1.3)	Childhood sexual abuse Marriage	Medically unexplained pelvic pain nearly everyday for 6 months or more	No pelvic pain	Not stated (laparoscopy not mentioned)

24	Schei B, Norway, English, 1991	180 (56 vs. 124)	Age not defined, women staying at refuge centre due to violent spousal relationship and women from emergency clinic, 69.3% acceptance rate	Adverse sexual experience History of pelvic inflammatory disease (PID) in abused women	Pelvic pain interfering with daily activities>3months excluding dysmenorrhoea	No pelvic pain	Not stated (outcome diagnosed by interview)
25	Stout AL, USA, English, 1991	102 (90 vs. 12)	The subjects were 32+/- 6 years old women scheduled for laparoscopic surgery for diagnostic or treatment purposes by gynaecologists on the faculty of Duke University Medical centre	Pelvic pathology AFS score	Pelvic pain including dysmenorrhoea, dyspareunia and pain at other times during the menstrual cycle	No pelvic pain	All women underwent laparoscopy
26	Bak AP, Netherlands, English, 1990	198	Age 18-45 years old women in a steady sexual relationship, of Dutch nationality and cultural background, who visited the gynaecology clinic at the Kijkzigt Hospital, Rotterdam between 1980-84, no pregnancy at inclusion, no hysterectomy or operation for adhesions, ovarian cysts, myoma uteri or oncological disease beforehand	Marriage Employment Low social class Depression Anxiety	Pelvic pain > 2 months, some with and some without gynaecological pathology	No pelvic pain	Percentage of women without demonstrable pelvic pathology with pelvic pain not stated

27	Drossman DA, USA, English, 1990	194 (20 vs. 174)	18-70 years, 51% married, mean age 43.5 years, 74% white, with high school education 12.7years, 100% acceptance rate referred to gastroenterology clinic of north Carolina memorial hospital	Sexual and physical abuse	Constant or recurring pelvic pain symptoms > 6 months	No pelvic pain	Not stated, none had laparoscopy
28	Rapkin A, USA, English, 1990	204 (31 vs. 32 and 141)	31+/-8vs. 43+/-15 years, over 75%white and middle class.	Childhood sexual, physical abuse Adulthood sexual, physical abuse Any abuse	Chronic pelvic pain who needed laparoscopy or laparotomy	No chronic pain seeking routine gynaecological care and second control group with other pain (headache, backache)	All cases had laparoscopy (numbers with organic pathology not defined), undefined months of follow up
29	Reiter RC, USA, English, 1990	198 (106 vs. 98)	28.6+/-7 vs. 27.7+/-9.6 years with a mean age 28.6 yrs, multiracial, <80% acceptance rate	Menarche Cycle length Gravidity & parity Duration of menses Spontaneous abortion Elective abortion Infertility	CPP (undefined) referred to pain clinic	No pain and presenting for annual screening	6 months, all patients had examination, investigations and laparoscopy (numbers with organic pathology not defined)
30	Bak AP, Netherlands, English, 1989	208 (81vs. 81 vs. 46)	Same population as in the above study (Bak 1989)	Somatization Strict sexual morality Psychosexual arousability Sexual aversion or avoidance Socio-emotional and sexual bonds with the partner	Pelvic pain > 2 months, some with and some without gynaecological pathology	No pelvic pain	Percentage of women without demonstrable pelvic pathology with pelvic pain not stated

31	Cunningham J, USA, English, 1988	60	Mean age 33 yrs, 21-55 years old women from rural area in the Midwestern region of USA. Similar characteristics in each group- 75% protestants, 75% currently married, mean no. of children 1.9 (0-7), one third had high school education or less, one third had some college education and one third had college degree	Childhood sexual abuse	Pelvic pain undefined	No pelvic pain	Not stated, number who had laparoscopy or pathology not stated
32	Harrop Griffiths, USA, English, 1988	55 (25vs. 30)	27+/-5.9 vs. 31.9+/-4.9 years old women who underwent laparoscopy for chronic pelvic pain, sterilisation or infertility at university hospital, a county hospital or a private medical centre were invited to participate, 83% patients and 73% controls agreed to participate	Marriage Lifetime depression Alcohol abuse Drug dependence/abuse Sexual abuse Inhibited sexual desire Current phobias Obsessive-compulsive disorder Anxiety Education Occupation Somatisation	Pelvic pain lasting 3 months or more	No pelvic pain	Not stated [52% pathology compared to 53.3% controls]

33	Heisterberg, Denmark, English, 1986	493	Women who had participated in a clinical trial in 1978-79 of prophylactic antibiotics in preventing postabortal pelvic inflammatory disease (PID), all women were seen 4 weeks post abortion when pelvic examination was performed and 40 women were found to have postabortal PID according to the criteria of infection used in the study, 79% follow up rate	Postabortal PID	Chronic pelvic pain	No pelvic pain	5-6 years follow up, number who had laparoscopy not stated
34	Magni G et al, Italy, English, 1986	60 (30 vs. 30)	30 women with CPP attending dept. of O&G of the university of Turin in Vercelli (16 were with positive laparoscopy and 14 with negative laparoscopy) were studied along with 30 women with no gynaecological complaints, verbal consent obtained	Anxiety Depression Somatisation	Pelvic pain for at least 6 months	No gynaecological complaints	Undefined, all cases had laparoscopy, 14/30 were positive, 5 ovarian cysts, 4 PID, 3 uterine anomaly, 2 endometriosis, 2 post surgical adhesions

35	Cooper J, UK, English, 1985	207	Physically and mentally healthy multiparous women, aged between, 23 and 45 years, mean age 32.8 years, were assessed shortly before and then at defined intervals following interval or postpartum sterilisation control subjects intended to use one non-permanent method of contraception for 12 months, changing method of contraception was the major reason for attrition of the sample among controls, subjects lost to the study at one year were no different from their counterparts who were re-interviewed on measures of age, parity, duration of marriage or mental state, follow up done in 83% of sterilisation sample and 69% of the controls	Sterilisation	Abdominal pain not associated with menses	No abdominal	114 had undergone sterilisation- postpartum or interval 12 months prior

36	Haber, USA, English, 1985	151 (12 vs. 139)	19-76 years, women referred to the pain centre, university of Alabama, Birmingham, USA were recruited, abused group19-68years (mean 42.5 years) and nonabused group 20-76 years (mean 44.6 years), 15% black, similar socio-economic groups with 37% of the total sample in the low socio-economic status category	Physical and / or sexual abuse	Pelvic pain undefined	No pelvic pain but with either headache, backache or other pain	Not stated
37	Renaer, Belgium, English, 1979	60 (15 and 22 vs. 23)	20-50+ years, 13 vs. 22 married, 2 vs. 5 senior high school education and 3 vs. 8 university education	Depression Hypochondriasis Paranoia Social introversion Neuroticism Interpersonal relations with partner	Chronic pelvic pain undefined	No pelvic pain	Not stated, 22/37 with endometriosis (all cases had laparoscopy)
38	Beard, UK, English, 1977	44 (18 & 17 vs. 9)	30.1 vs. 29.8 vs. 29.7 yrs old women, cases-8 nulliparous and married, 15 Caucasian, 2nd group- controls- 6 nulliparous and married, 8 Caucasian	Neuroticism Extraversion Marriage Nulliparity Critical attitude towards husband/consort Happy childhood Good relationship with mother	Pelvic pain undefined	No pelvic pain	Not stated, 17/35 had positive laparoscopy-PID, endometriosis, chronic tubal ectopic pregnancy, tubal operation

39	Pietro Castelnuovo, USA, English, 1970	92 (40 vs. 27, 25 vs. 27)	19-46 vs. 28-64 years, cases and controls both from lower socio-economic class and from Ann Harbor hospital, 5 Negroes in each group, another group with CPP between 21-48 years from lower middle class and UCLA medical centre	Financial dependence Marriage High school education Psychopathological states	CPP > 5 months	Varied pelvic pathology but without CPP	Undefined, 100% of cases had laparoscopy (25/40 with organic pathology) in Ann Harbor hospital
40	Gidro-Frank, USA, English, 1960	65 (40 vs. 25)	22-48 vs. 19-36 years old, 11 primiparous and 14 multiparous English speaking women, >95% follow up	Psychosomatic symptoms Critical attitude towards husband and home Disturbed pregnancies Borderline syndrome Neurosis Painful early memories	Suprapubic pain located in one or both quadrants, often radiating to sacral area and thighs, referred from special gynaecological pain clinic	Pregnant patients with no CPP	9 months, number of them had undergone previous hysterectomy or presacral neurectomy for pain

Appendix 3.12: Table of quality assessment of included studies on noncyclical pelvic pain

No.	Authors, year	Study design	Recruitment of study subjects	Method of ascertainment of risk factor or exposure	Method of ascertainment of outcome	Temporality of association	Control for confounding	List of confounding factors	Compliance with quality criteria* (out of 6)
1	Lampe A, 2003	Retrospective, case-control	Consecutive	Semi structured interview by women trained in depth in psychology- inventory of life changing events, Becks depression inventory	Examination in GOPD	Yes for childhood abuse	Yes	Age, social status	5
2	Almeida ECS, 2002	Retrospective, case-control	Consecutive	Data extraction form- valid	Laparoscopy	Not studied	Yes	History of caesarean section, endometriosis, pelvic adhesions, sequelae of PID, leiomyomas and pelvic varices	4

3	Okonfua, 2002	Cross-sectional survey	Consecutive	Structured questionnaire	Examination	Yes	Yes	Age, religion, ethnic group, education, husband's education, marital status, number of co-wives, age at first sex, frequency of sex in the last month and times pregnant at survey	5
4	Runtz, 2002	Retrospective, cross sectional survey	Undefined	Validated questionnaire	Questionnaire	Yes	Yes	Age, stage of menstrual cycle	3
5	Bodden-heidrich, 2001	Retrospective, Case-control	Not defined	Validated psychological testing	Standardised questionnaire administered by interview	Not stated	Yes	Age, alcohol abuse in family, sexual abuse	2
6	Erickson DR, 2001	Retrospective, case-control	Not defined	University of Wisconsin questionnaire	Questionnaire	Not studied	No	None	1
7	Lampe A, 2000	Retrospective, case-control, blinded	Consecutive	Validated semi structured interview by women trained in depth in psychology	USS, laparoscopy	Not stated	No	None	4

8	Bodden-heidrich, 1999	Retrospective, Case-control	Not defined	Validated Psychotherapeutic interview (Freiburg Personality Inventory and Gieben test)	Outpatient and inpatient evaluation	Yes for some (Alcoholism in parent, death or divorce of parent < 16 years of age)	Yes	Age, education, marital status	4
9	Ehlert, 1999	Retrospective, case-control	Consecutive	Semi structured psychiatric interview, completion of psychometric tests	Laparoscopy	Not studied	No	None	3
10	Green C, 1999	Retrospective, case-control	Consecutive	Validated questionnaire	Examination	Not studied	No	None	3
11	Tong, 1999	Retrospective, case-control,	Consecutive	Medical records database (valid method)	Self reported symptoms, reasons given for sick leave or change of job, contacting patient's physician	Not stated	Yes	Age, menstrual cycle length and duration, dysmenorrhoea, parity, occupation, education	3
12	Collett B, 1998	Retrospective, case-control	Consecutive for cases and random for controls	Sexual life events inventory used by Palmer et al, Hospital Anxiety and Depression questionnaire and Somatisation scale by Reiter and Gambone	Laparoscopy for cases and questionnaires for controls	Yes for childhood sexual abuse	Yes	Age	5

13	Gurel SA, 1997	Retrospective, Case-control	Not defined	Interview, validation not stated	Interview	Not studied	Yes	Parity, education, antenatal care, marriage period, place of delivery	2
14	Jamieson DJ, 1997	Retrospective, cross-sectional survey	Consecutive	Validated questionnaire developed for the National Population Survey of Canada	Questionnaire	Yes for childhood sexual abuse	Yes	Age, parity, education, income, marital status, race	5
15	Thornton JG, 1997	Retrospective, case-control, blinded to reviewers	Not stated	Laparoscopy-valid method	Interview-validation not stated	N/A	Yes	Age, time of menstrual cycle and presence of more than one recorded pathology	4
16	Dellenbach, 1996	Retrospective, case-control	Not stated	Interview and psychometric testing with Rorschach test (valid)	Examination, USS, laparoscopy	Not studied	No	None	2
17	Hodgkiss, 1994	Retrospective, Case-control, blinded to researcher	Consecutive	Validated Hospital, anxiety and depression scale, illness	Laparoscopy	Not stated	No	None	4

		and the patient		behaviour inventory (IBI), pain adjective checklist of the MPQ and the disease conviction scale of the IBQ					
18	Walling M, 1994	Retrospective, case-control, blinded	Consecutive	Validated Structured telephone interview patterned after the interview developed by Russel	Laparoscopy in cases and interview in controls	Yes for childhood sexual abuse, not studied for others	No	None	5
19	Heisterberg, 1993	Retrospective, cohort	Not defined	Questionnaire-valid	Questionnaire-validation not stated	Yes	Yes	Previous spontaneous abortions, number of induced abortions, previous PID, parity and age	3
20	Kirkengen, 1993	Retrospective, cross sectional	Consecutive	Interview-validity not stated	Interview	Yes	Yes	Age, parity	3
21	Rulin M, 1993	Prospective cohort	Not defined	Questionnaire-filled at interview-validity not stated	Questionnaire	Yes	Yes	Age, parity	3

22	Springs FE, 1992	Retrospective, cross-sectional study	Random	Validated previously used sexual abuse questionnaire, SCL 90 somatisation scale	Examination	Not stated	Yes	Age, education, marital status and income	4
23	Walker EA, 1992	Retrospective, Case-control	Subjects who satisfied definition in 1month period	Valid structured sexual assault interview by 2 trained interviewers, self report questionnaire	Questionnaire	Yes (childhood abuse) Not studied for others	No	None	3
24	Schei B, 1991	Retrospective, cross sectional survey	Random	Validated questionnaire	Questionnaire	Not studied	Yes	Age, history of PID	3
25	Stout AL, 1991	Retrospective, case-control, blinded to surgeons	Not defined	Laparoscopy	McGill pain questionnaire, West Haven - Yale Multidimensional Pain inventory part 1-validated	Not studied	Yes	Race, education, employment	3
26	Bak, 1990	Retrospective, case-control	Not defined	Validated Dutch adjustment of the Minnesota Multiphasic Personality Inventory (MMPI)	Laparoscopy	Not stated	No	None	2

27	Drossman DA, 1990	Retrospective, cross-sectional study	Consecutive	Validated sexual abuse questions developed from national population survey of Canada and previously used physical abuse questionnaire	Examination and investigations by gastroenterologist	Not stated	Yes	Age, race, marital status	4
28	Rapkin A, 1990	Retrospective, Case-control	Consecutive	Validated and standardised questions in interview	Laparoscopy, laparotomy, treatment in pain clinic	Yes (childhood sexual or physical abuse), Not studied for others	Yes	Age, marital and socio-economic status	5
29	Reiter RC, 1990	Retrospective, Case-control	Consecutive	Questionnaires administered by personal interview, unclear whether validated	Examination, investigations and laparoscopy	Undefined	Yes	Age	3
30	Bak AP, 1989	Retrospective, case control	Not stated	Validated Sexual Experience Scale (Dutch version)	Gynaecological examination	Not studied	No	None	2
31	Cunningham J, 1988	Retrospective, Case-control	Not defined	6 page questionnaire-validity not stated	Questionnaire	Yes	Yes	History of molestation, frequency and intensity of abuse	2
32	Harrop Griffiths, 1988	Retrospective, Case-control	Not defined	Validated structured psychiatric interview	Laparoscopy	Yes (childhood sexual abuse), Not studied for others	No	None	3

33	Heisterberg, 1986	Retrospective, case-control	Not stated	Questionnaire-not stated whether validated	Questionnaire, hospital records and information from women's physician	Yes	No	None	2
34	Magni, 1986	Retrospective, case-control	Not stated	Validated, semi structured interviews- Zung self rating depression scale (SDS) and the Middlesex hospital questionnaire (MHQ)	Laparoscopy in cases and questionnaire in controls	Not studied	Yes	Socio-demographic characteristics	3
35	Cooper, 1985	Prospective, case-control	Not defined	Present state examination (PSE) and a set of standardised Information Schedule-validated	Questionnaire	Not studied	Yes	Age, parity	3
36	Haber, 1985	Retrospective, Case-control	Not defined	Validated interview by psychologist or trainee psychologist	Pain clinic assessment	Not studied	No	None	2

37	Renaer, 1979	Retrospective, case-control	Not stated	Validated Dutch adjustment of the Minnesota Multiphasic Personality Inventory (MMPI)	Laparoscopy	Not studied	No	None	2
38	Beard, 1977	Retrospective, case control	Not stated	Eysenck Personality Inventory (valid)	Laparoscopy for cases and questionnaires for controls	Not studied	No	None	2
39	Pietro Castelnuovo , 1970	Retrospective, Case-control	Not stated	Validated Psychiatric interview with brief questionnaire, psychological testing- Minnesota multiphasic personality inventory, examination for organic pathology	Laparoscopy or laparotomy in cases vs. examination in controls	Not studied	No	None	2
40	Gidro-Frank, 1960	Retrospective case-control	Not defined	Weekly semi structured psychiatric interviews (1-60) for cases and once a month interview X 8 and weekly in the 9th	Examination	Yes for disturbed puberty	No	None	3

						month for pregnant control-valid method	

* Indicates the number of quality items satisfied out of a total of six including prospective study design or blinding, consecutive recruitment of subjects or other appropriate method, adequate ascertainment of risk factor or exposure, adequate ascertainment of outcome, temporality of association and control for confounding.

Appendix 3.13: Table of results from studies on risk factors in noncyclical pelvic pain

Author, year	Risk factor/ Exposure	Exposure in those with CPP (%) / Mean score	Exposure in those without CPP or control group (%)/ Mean score	Measure of association: Odds ratio or Mean difference	95% Confidence interval	P value	Comments
Lampe A, 2003	Childhood sexual abuse	11/40 (27.5)	5/22 (22.73) Pain free	1.29	0.38-4.34	0.59	
Collett B, 1998	Sexual abuse <16 years	6/30 (20)	4/30 (13.33) Pain free	1.63	0.41-6.47	0.73	
Jamieson DJ, 1997	Childhood sexual abuse			1.2*	0.61-2.36*	0.003	
Walling M, 1994	Any childhood sexual abuse	26/64 (41)	17/46 (37) Pain free	1.2	0.54-2.54	0.85	
Walling M, 1994	Major childhood sexual abuse	23/64 (36)	9/46 (20)	2.3	0.95-5.61	0.1	
Kirkengen, 1993	Childhood sexual abuse	13/24 (54)	9/61 (15) Pain free	6.8	2.34-19.91	0.001	
Walker EA, 1992	Severe childhood sexual abuse	12/22 (54.55)	1/21(4.76) Pain free	24	2.72-211.6	0.001	
Rapkin A, 1990	Childhood sexual abuse	6 / 31 (19.4)	2/32(6.25) Pain free	3.6	0.67-19.43	0.15	

Harrop Griffiths, 1988	Childhood sexual abuse (</= 14 years)	16/25 (64)	7/30 (23.33) Pain free	5.8	1.80-18.93	0.01
Cunningham J, 1988	Childhood sexual abuse	M score 7, SD 7.4	M score 3.8, sd 6.8	d 3.2	0.48-6.88	0.09
Runtz, 2002	Childhood sexual abuse	M 7.9, sd 5.6	M7.3, sd 5.3		-0.37-1.27	0.23
Collett B, 1998*	Sexual abuse <16 years	6/30 (20)	2/30 (6.67) Other pain	3.5	0.65-18.98	0.25
Walling M, 1994	Any childhood sexual abuse	26/64 (41)	13/42 (31) Headache	1.5	0.67-3.47	0.42
Rapkin A, 1990	Childhood sexual abuse	6/31(19.4)	25/141(17.7) Other pain	1.11	0.67-5.26	0.24
Walling M, 1994	Major childhood sexual abuse (< 15 years)	23/64 (36)	7/42 (17) Headache	2.8	1.08-7.32	0.53
Lampe A, 2003	Childhood sexual abuse	11/40 (27.5)	8/39 (20.5) Low backache	1.47	0.52-4.17	0.64
Lampe A, 2003	**Childhood physical abuse	25/40 (62.5)	6/22 (27.3) Pain free	4.44	1.42-13.8	0.01
Rapkin A, 1990	Childhood physical abuse	12 /31(38.7)	3/32 (9.4) Pain free	6.1	1.52-24.54	0.008
Walling M, 1994	Childhood physical abuse	25/64 (39)	7/46 (15) Pain free	3.6	1.38-9.22	0.01
Runtz, 2002	Childhood Physical abuse	M 8.7, sd 6.0	M 7.1, sd 5.1 Pain free		0.66-2.5	0.001

Walling M, 1994	Childhood physical abuse	25/64 (39)	12/42 (29) Headache	1.6	0.69-3.7	0.37	
Rapkin A, 1990	Childhood physical abuse	12/31(38.7)	19/141 (13.4) Other pain	4.06	1.7-9.67	0.002	
Lampe A, 2003	Childhood physical abuse **	25/40 (62.5)	21/38 (55.26) Low backache	1.35	0.55-3.33	0.67	
Walker EA, 1992	Any Childhood abuse	18/22 (81.82)	4/21 (19.04)	6	1.5-23.99	0.02	
Lampe A, 2000	Sexual abuse (Russell's criteria)	13/36 (36.1)	3/20 (15) Pain free	3.2	0.79-13.03	0.1	
Ehlert, 1999	Sexual abuse	15/25 (60%)	3/10 (30%)	3.5	0.73-16.85	0.15	
Rapkin A, 1990	Adulthood sexual abuse	2 /31(6.5)	0/32 Pain free	3.3	0.33-33.46	0.36	
Collett B, 1998	Sexual abuse >/= 16 years	6/30 (20)	1/30 (3.33) Pain free	7.25	0.82-64.46	0.6	
Collett B, 1998	Lifetime sexual abuse	12/30	10/60 Other pain and pain free group	3.33	1.23-9.03	0.03	
Jamieson DJ, 1997	Adulthood sexual abuse			3.34*	1.84-6.08*	<0.001*	
Rapkin A, 1990	Adulthood sexual abuse	2/31(6.5)	11/141(7.8) Other pain	0.8	0.17-3.87	1	
Collett B, 1998	Sexual abuse >/= 16 years	6/30 (20)	3/30 (10) Other pain	2.25	0.51-9.99	0.46	
Springs FE, 1992	Sexual abuse					<0.004*	Sexual abuse 2-2.5 times

							more frequently reported by those who reported pelvic pain
Harrop Griffiths, 1988	Adulthood sexual abuse (> 14 years)	12/25 (48)	4/30 (13.33)	6	1.61-22.3	0.012	
Schei B, 1991	Sexual abuse	32/56 (57.14)	34/124 (27.42)	3.5	1.82-6.83	0.0002	
Walling M, 1994	Major lifetime sexual abuse	34/64 (53)	13/46 (28)	2.9	1.28-6.45	0.02	
Walling M, 1994	Major lifetime sexual abuse [ii]	34/64 (53)	14/42 (33) Persistent headache	2.3	1.01-5.08	0.07	
Walling M, 1994	Any lifetime sexual abuse	36/64 (56)	23/46 (50)	1.3	0.60-2.75	0.65	
Walling M, 1994	Any lifetime sexual abuse [iii]	36/64 (56)	18/42 (43) Persistent headache	1.7	0.78-3.76	0.25	
Lampe A, 2000	Sexual abuse (Russell's criteria)	13/36 (36.1)	4/23 (17.4) Low back pain	2.7	0.75-9.60	0.21	
Green C, 1999	Sexual abuse	5/11(45.45%)	12/29 (41.38%) Backache	1.18	0.29-4.78	1	
Bodden-heidrich, 1999	Sexual abuse (explicit statement by the patient)	23/106 (22)	1 /36(3) Chronic vulval pain syndrome	9.7	1.26-74.64	0.01	
Green C, 1999	Sexual abuse	5/11(45.45%)	12/20 (60%) Headache	0.56	0.13-2.46	0.48	

Collett B, 1998	Physical abuse	8/30 (26.67)	8/30 (26.67) Pain free	1	0.32-3.11	1
Walling M, 1994	Lifetime physical abuse	32/64 (50%)	14/46 (30.4%)	2.29	1.03-5.07	0.06
Rapkin A, 1990	Adulthood physical abuse	3 /31(9.7)	1/32(3.1) Pain free	3.3	0.33-33.8	0.35
Collett B, 1998	Physical abuse	8/30 (26.67)	6/30 (20) Other pain	1.45	0.44-4.86	0.76
Rapkin A, 1990	Adulthood physical abuse	3 /31(9.7)	23/141(16.3) Other pain	0.5	0.15-1.96	0.42
Ehlert, 1999	Physical abuse	13/25 (52%)	3/10 (30%)	2.53	0.53-12.07	0.29
Walling M, 1994	Lifetime physical abuse	32/64 (50)	16/42 (38) Persistent headache	1.6	0.74-3.59	0.3
Rapkin A, 1990	Any abuse	17/31(54.8)	51/141 (36.2) Other pain	2.1	0.97-4.7	0.08
Rapkin A, 1990	Any abuse	17/31(54.8)	5 /32 (15.6)	6.1	1.99-21.51	0.001
Drossman DA, 1990	Lifetime sexual and / or physical abuse	14/20 (70)	6/174 (3.45)	65.33	18.6-229.4	1.63
Green C, 1999	Physical abuse	1/7 (14.3%)	7/15 (46.67%) Headache	0.19	0.02-1.99	0.2
Green C, 1999	Physical abuse	1/7 (14.3%)	8/17 (47.06) Backache	0.35	0.03-3.45	0.6
Green C, 1999	Physical and sexual abuse	7/13	16/24 Other pain	0.58	0.14-2.32	0.68

Walling M, 1994	Major sexual [vi]and physical abuse	27/64 (42)	8/42 (19) Pain free	3.1, 3.4*	1.24-7.75, 1.2-9.5*	0.02, 0.01*
Walling M, 1994	Major sexual and physical abuse	27/64 (42)	9/46 (20) Persistent headache	3	1.24-7.24	0.02
Haber, 1985	Physical and / or sexual abuse	8/12 (66.67)	11/15 (73.33) Headache	0.7	0.14-3.82	1
Haber, 1985	Physical and / or sexual abuse	8/12 (66.67)	30/66 (45.45) Backache	2.4	0.66-8.76	0.3
Haber, 1985	Physical and / or sexual abuse	8/12 (66.67)	31/58 (53.45) Other pain	1.7	0.47-6.43	0.6
Lampe A, 2000	Psychological abuse [iv]	9/36 (25)	5/23 (21.7) Other pain	1.2	0.5-4.17	0.05*
Lampe A, 2000	Psychological abuse	9/36 (25)	0/20 Pain free	7.4	0.89-63.24	0.04^
Walling M, 1994	Marriage	41/64 (64.06)	28/46 (60.87)	1.2	0.52-2.5	0.88
Walker EA, 1992	Marriage	9/22 (40.91)	13/21 (61.9)	0.35	0.1-1.15	0.15
Harrop Griffiths, 1988	Marriage	9/25 (36)	24/30 (80)	0.14	0.041-0.472	0.002
Hodgkiss, 1994	Marriage	15/29 (51.72)	19/33 (57.58)	0.79	0.29-2.15	0.84
Beard, 1977	Marriage	21/35 (60)	6/9 (66.67)	0.8	0.16-3.5	1
Castelnuovo-Tedesco P, 1970	Marriage	13/40 (32.5) With or	11/27 (40.47)	0.7	0.25-1.93	0.67

		without organic pathology				
Walling M, 1994	Marriage	41/64 (41)	23/42 (54.8) Headache	1.5	0.67-3.26	0.45
Reiter RC, 1990	Duration of menses	5.5+/-1.7	4.4+/-1.8	1.1		<0.001*
Reiter RC, 1990	Cycle length	M 28, sd 2.7	M 27.8, sd 2.6	0.2		0.6
Reiter RC, 1990	Menarche	M 13, sd 2.2	M 13.2, sd 1.7	-0.2		0.5
Reiter RC, 1990	Spontaneous abortion	35/106 (33)	12/92 (13)	3.3	1.58-6.82	0.002
Reiter RC, 1990	Elective abortion	24/106 (22.6)	27/92 (29.35)	0.7	0.37-1.34	0.36
Reiter RC, 1990	Gravidity>0	77/106 (73)	68/92 (74)	0.6	0.27-1.12	0.14
Reiter RC, 1990	Parity >0	61/106	52/92 (57)	0.9	0.5-1.76	1
Dellenbach, 1996	Parity	1.01, sd 1.1 With organic cause	1.9, sd 0.9 Pain free	-0.89		0.02
Dellenbach, 1996	Parity	1.15, sd 1.1 Without organic cause	1.9, sd 0.9 Pain free	-0.75		0.07
Beard, 1977	Nulliparity	15/35 (42.86)	6/9 (66.67)	0.38	0.08-1.75	0.27
Reiter RC, 1990	Infertility	17/106 (16)	9 /92 (10)	1.8	0.74-4.17	0.03

Rulin MC, 1993	Sterilisation	80/118 (67.8)	420/701 (59.91)	1.41	0.93-2.13	0.13
Cooper, 1985	Sterilisation	27/47 (57.45)	87/160 (54.38)	1.13	0.56-2.31	0.71
Heisterberg, 1993	Previous PID	(6%)	(0.4%)	13.1*	10.09-16.04*	
Heisterberg, 1986	Postabortal PID	4/11 (36.36)	25/341 (7.33)	7.2	1.98-26.34	0.004, p<0.001*
Bodden-heidrich, 2001	Anxiety/ Nervousness	8.87	4.15	4.72		<0.001
Walling M, 1994	Anxiety	M 56.83, sd 10.98	M 55.13, sd 9.81 Pain free	1.7	-2.32 to5.72	0.4^
Walling M, 1994	Anxiety	M 56.83, sd 10.98	M 57.26, sd 10.01 persistent headache	4.36	-3.75 to 4.61	0.84
Harrop Griffiths, 1988	Anxiety	M 62.0, sd 11.5	M 45.0, sd 11.7	17		<0.0001
Magni, 1986	Anxiety (16/30 Positive laparoscopy)	9.06+/-4.6	8.3+/-3.12	-1.5 to 3.06	0.5	
Magni, 1986	Anxiety (14/30 Negative laparoscopy)	10.9+/-4.2	8.3+/-3.12	0.28 to 4.8	0.02	
Hodgkiss, 1994	Anxiety	13/29 (44.83)	11/33 (33.33)	1.63	0.58-4.54	0.04
Collett B, 1998	Anxiety	24/30 (80)	17/30 (56.67) Other pain	2.21	0.51-9.99	0.47
Collett B, 1998	Anxiety	24/30 (80)	13/30 (43.33) Pain free	5.23	1.66-16.51	0.008

Collett B, 1998	Depression	14/30 (46.67)	11/30 (36.67) Other pain	1.51	0.54-4.24	0.6
Collett B, 1998	Depression	14/30 (46.67)	6/30 (20) Pain free	3.5	1.11-11.01	0.05
Walling M, 1994	Depression	M 61.61, sd 8.83	M 59.11,sd 8.45 Pain free	2.5	-0.8 to 5.8	0.14
Walling M, 1994	Depression	M 61.61, sd 8.83	M 61.62, sd 6.90 Persistent headache		-3.19 to 3.21	1^
Lampe A, 2003	Depression	M10.21, sd 9.27	M11.32, sd 9.25 Backache			0.59
Lampe A, 2003	Depression	M10.21, sd 9.27	M 2.73, sd 3.09		3.41-11.55	0.0005
Bak, 1990	Depression (Pos. laparoscopy)	M54.0, sd 12.6	M 45.5, sd 12.4			P<0.005*
Bak, 1990	Depression (Neg. laparoscopy)	M 54.6, sd 12.7	M 45.5, sd 12.4			P<0.005*
Magni, 1986	Depression (Pos. laparoscopy)	42.2+/-11.2	38.4+/-7.5	-1.77 to 9.37	0.18	
Magni, 1986	Depression (Neg. laparoscopy)	51.3+/-9.67	38.4+/-7.5	7.5 to 18.26	<0.0001	
Hodgkiss, 1994	Depression	11/29 (37.93)	4/33 (12.12)	4.43	1.22-16.04	0.03
Harrop Griffiths, 1988	Lifetime depression	16/25 (64)	5/30 (16.67)	8.9	2.52-31.35	0.001
Bodden-heidrich, 2001	Depression	7.75	4.26			<0.001

Renaer, 1979	Depression	M 61.8,sd 11.0 (N=22) Endometriosis on laparoscopy	M 50.5, sd 9.2 (N=23)			0.001
Renaer, 1979	Depression	M 60.9, sd 13.9 (N=15) Negative laparoscopy	M 50.5, sd 9.2			0.01
Bodden-heidrich, 2001	Emotional lability	6.59	4.79			0.003
Beard, 1977	Neuroticism	M 15.1, sd 5.10(negative laparoscopy n=18)	M 10.44, sd 5.10	MD 4.7		0.03
Beard, 1977	Neuroticism	M 12.88, sd 5.04(positive laparoscopy-n=17)	M 10.44, sd 5.10 (n=9)	MD 2.4		0.25
Beard, 1977	Extraversion	M 10.00, sd 5.10(negative laparoscopy)	M 11.67, sd 5.00	MD -1.7		0.43
Beard, 1977	Extraversion	M 12.00, sd 3.52(positive laparoscopy)	M 11.67, sd 5.00			0.85
Harrop Griffiths, 1988	Lifetime alcohol abuse	9/25 (36)	7/30 (23.33)	1.9	0.57-5.99	0.46
Harrop Griffiths,	Current drug	3/25 (12)	1/30 (3.33)	4.0	0.38-	0.32

1988	dependence				40.64	
Harrop Griffiths, 1988	Current phobias	8/25 (32)	3/30 (10)	4.2	0.98-18.22	0.09
Harrop Griffiths, 1988	Obsessive-compulsive disorder	M 58.0, sd 14.1	M 46.2, sd 11.5	11.8		0.001
Harrop Griffiths, 1988	Somatization	M 7.2,sd 4.8	M 1.7, sd 1.9			<0.001
Ehlert, 1999	Undifferentiated somatoform disorder	9/25 (36)	0/10	12.1	0.63-230.36	0.03
Bak, 1990	Somatization (Positive laparoscopy)	M 65.3, sd 11.1	M 50.4, sd 12.2			<0.005*
Bak, 1990	Somatization (Negative laparoscopy)	M 66.5, sd 10.7	M 50.4, sd 12.2			<0.005*
Magni, 1986	Somatization (Positive laparoscopy)	8.5, sd 3.8	6.4, sd 2.3		0.34 to 3.92	0.02
Magni, 1986	Somatization (Negative laparoscopy)	8.8, sd 2.2	6.4, sd 2.3		0.95 to 3.88	0.002
Bak, 1990	Hysteria (Positive laparoscopy)	M 62.5, sd 10.0	M 50.0, sd 13.0			<0.005*
Bak, 1990	Hysteria (Negative laparoscopy)	M 66.9, sd 10.8	M 50.0, sd 13.0			<0.005*

Hodgkiss, 1994	Disease conviction (Somatisation)	M 3.4, sd 1.7	M 1.1, sd 1.1			<0.001*
Gidro-Frank, 1960	Psychosomatic symptoms	24/40 (60)	5/25 (20)	6	1.87-19.26	0.004
Dellenbach, 1996	Disturbed puberty	21/40 (52.5) Without organic cause	0/10 (0) Pain free	23.2	1.27-421.8	0.003
Dellenbach, 1996	Disturbed puberty	6/20 (30) With organic cause	0/10 (0) Pain free	9.41	0.48-186.1	0.07
Gidro-Frank, 1960	Painful early memories	16/22 (72.7)	7/16 (43.8)	3.4	0.87-13.3	0.14
Bodden-heidrich, 1999	Alcoholism in 1 parent (physical or mental dependency on alcohol that affected the social situation of the family)	26/106 (24.5)	3/36 (8.3)	3.6	1.01-12.62	
Bodden-heidrich, 1999	Parents divorced<16 yrs age	37/106 (34.9))	3/36 (8.3)	5.9	1.69-20.54	
Bodden-heidrich, 1999	Death of 1 parent<16yrs	13/106 (12.26)	2/36 (6)	2.4	0.51-11.08	
Gidro-Frank, 1960	Critical attitude to home	26/40 (65)	10/25 (40)	2.8	0.99-7.8	0.09
Gidro-Frank,	Disturbed	25/32 (78.13)	9/25 (36)	6.4	1.97-	0.003

1960	pregnancies [v]				20.46		
Lampe A, 2003	Severe stressful life events	15/43 (34.88)	11/22 (50) Pain free	0.54	0.19-1.52	0.36	
Lampe A, 2003	Severe stressful life events	15/43 (34.88)	17/40 (42.5) Backache	0.72	0.30-1.76	0.63	
Ehlert, 1999	Critical life events	M 6.3, sd 0.48	M 4.79, sd 0.46			<0.0001	
Ehlert, 1999	Post traumatic stress disorder	7/25 (28)	0/10	8.51	0.44-154.5	0.07	
Harrop Griffiths, 1988	Inhibited sexual desire	7/25 (28)	2/30 (6.7)	5.4	1.02-29.19	0.06	
Bak AP, 1989	Sexual morality	M 41.8, sd 6.4 With gynaecological pathology	M 38.2, sd 5.1			<0.05*(ANOVA two tailed tests)	
Bak AP, 1989	Sexual morality	M 41.6, sd 7.5 (without pathology)	M 38.2, sd 5.1			<0.05*	Patients with CPP displayed stricter sexual morality, CPP group with pain> 2 months without demonstrable cause
Bak AP, 1989	Psychosexual arousability	M 49.6, sd 11.0	M 45.7, sd 9.6			<0.05*	CPP patients have non-involvement,

					avoidance or rejection of audiovisual sexual stimuli or have low arousability, cases with gynaecological abnormality
Bak AP, 1989	Psychosexual arousability	M 52.3, sd 9.5 (without pathology)	M 45.7, sd 9.6	<0.05*	
Bak AP, 1989	Sexual aversion or avoidance	M 50.0, sd 11.6	M 44.8, sd 9.9	<0.05*	All pelvic pain patients tend to have a negative feeling towards coitus and a strong tendency to avoid intimate bodily contact compared with control group, patients with gynaecological abnormality
Bak AP, 1989	Sexual aversion or avoidance	M 50.8, sd 11.1 (without pathology)	M 44.8, sd 9.9	<0.05*	

Bak AP, 1989	Socio-emotional and sexual bonds with the partner and strong socio-moral resistance to breaking the marriage	M 55.6, sd 12.7 (with pathology)	M 59.2, sd 12.5			0.13
Bak AP, 1989	Socio-emotional and sexual bonds with the partner and strong socio-moral resistance to breaking the marriage	M 54.0, sd 11.3 (without pathology)	M 59.2, sd 12.5			<0.05
Beard, 1977	Less positive attitude to own genitals	M 4.42, sd 0.61(negative laparoscopy)	M 5.33, sd 0.66			0.002
Beard, 1977	Less positive attitude to own genitals	M 4.84, sd 0.75(positive laparoscopy)	M 5.33, sd 0.66			
Beard, 1977	Less positive attitude to husband/ boyfriend's genitals	M 4.61, sd 0.68(negative laparoscopy)	M 5.71, sd 0.64			0.001
Beard, 1977	Less positive attitude to husband/ boyfriend's genitals	M 5.48, sd 0.90(positive laparoscopy)	M 5.71, sd 0.64			0.5
Beard, 1977	Critical attitude towards husband/consort/ unhappy relations	7/18 (38.89) (negative laparoscopy)	0/9 (0)	12.4	0.62-246.13	0.05

	with husband					
Dellenbach, 1996	Unsatisfactory relationship with spouse	22/40 (55) No organic cause	3/10 (30) Pain free	2.85	0.64-12.6	0.3
Dellenbach, 1996	Unsatisfactory relationship with spouse	5/20 (25) With organic cause	3/10 (30) Pain free	0.8	00.16-4.21	1
Beard, 1977	Less positive attitude to oneself (negative laparoscopy)	M 4.45, sd 0.51	M 5.40, sd 0.64			0.0003
Beard, 1977	Less positive attitude to oneself (positive laparoscopy)	M 5.17, sd 0.66	M 5.40, sd 0.64			0.4
Beard, 1977	Less positive attitude to husband/ boyfriend (positive laparoscopy)	M 5.6, sd 0.81	M 6.25, sd 0.34			0.03
Beard, 1977	Unhappy childhood	7/18 (38.89)	1/9 (11.11)	5.1	0.52-50	0.2
Beard, 1977	Unhappy childhood (positive laparoscopy)	2/17 (11.76)	1/9 (11.11)	1.07	0.08-13.7	1
Beard, 1977	Unsatisfactory relationship with mother	14/18 (77.77)	1/9 (11.11)	28	2.65-295.7	0.003
Beard, 1977	Unsatisfactory	8/17 (47.06)	1/9 (11.11)	7.11	0.72-	0.1

	relationship with mother (positive laparoscopy)_				69.99	
Gidro-Frank, 1960	Critical attitude towards husband (atmosphere of discontent and dissatisfaction in marriage)	25/40 (62.5)	6/25 (24)	5.2	1.72-16.5	0.006
Walling M, 1994	Physical symptoms (Wahler Physical Symptom Inventory)	M 15.34, sd 7.57	M 11.61,sd 6.40		1.01 to 6.45	0.01
Walling M, 1994	Physical symptoms	M 15.34, sd 7.57	M 13.95, sd 6.72 Headache for >6 months excluding migraine		-1.46 to 4.24	0.34
Almeida ECS, 2002	Previous caesarean section	78/116 (67.2%)	32/83 (38.5%)	3.27	1.82-5.89	0.0001
Tong, 1999	Previous caesarean section	43/1000	12/1000	3.7	1.94-7.06	<0.0001
Thornton JG et al, 1997	Mild endometriosis	30/132 (22.73)	24/105 (22.86)	1.0, 1.3*	0.54-1.83, 0.5-1.28*	1
Thornton JG et al, 1997	Endometriosis (6-15)	8/132 (6.06)	4/105 (3.81)	1.6, 2.5*	0.48-5.57, 0.4-7.1	0.63
Stout AL, 1991	AFS score	7.2+/-12.5	1.6+/-4.6			<0.05*
Thornton JG et al, 1997	Adhesions	6/132 (4.55)	7/105 (6.67)	0.7, 0.6*	0.22-2.05, 0.2-4.7*	0.67
Almeida ECS,	Adhesions	60/116	19/83 (22.9%)	3.61	1.93-6.77	<0.0001

2002		(60.7%)					
Stout AL, 1991	Pathologic findings on laparoscopy	71/90 (78.8)	7/12 (58.3)	2.67	0.76-9.36	0.15	
Heisterberg, 1993	Age	-	-	0.9*	0.83-1.01*		
Almeida ECS, 2002	Previous PID	37/116 (31.9%)	4/83 (4.8%)	9.25	3.15-27.16	<0.0001	
Heisterberg, 1993	Previous PID			13.07*	10.09-16.04*		
Almeida ECS, 2002	Pelvic varices	13/116 (11.2%)	3/83 (3.6%)	3.36	0.93-12.21	0.09	
Thornton JG et al, 1997	Dilated veins> 9 mm	15/132 (11.36)	9/105 (8.57)	1.4, 1.1*	0.57-3.26, 0.4-3.2*	0.62	
Almeida ECS, 2002	Leiomyomas	8/116 (6.9%)	6/83 (6.7%)	0.95	0.32-2.85	1	
Bodden-heidrich, 2001	Orthopaedic problems	82/94 (87.2)	10/35 (28.6)	17.1	6.6-44.23	<0.0001	
Erickson DR, 2001	Interstitial cystitis	1.8**	0.005**			0.0001	**Mean score for each group, women with interstitial cystitis have higher scores than controls for other pelvic

						discomfort.
Walling M, 1994	Employment	42/64 (65.6)	31/42 (73.8) persistent headache	0.7	0.29-1.6	0.5
Walling M, 1994	Employment	42/64 (65.63)	22/46 (47.83)	2.08	0.96-4.52	0.09
Hodgkiss, 1994	Employment	13/29 (44.83)	13/33 (39.39)	1.25	0.33-4.65	0.86
Castelnuovo-Tedesco P, 1970	Employment/financial independence	20/40 (50)	5/12 (41.67)	1.39	026-7.4	
Castelnuovo-Tedesco P, 1970	High school education	4/40 (10) With or without organic pathology	6/27 (22.22)	0.4	0.1-1.54	0.29
Castelnuovo-Tedesco P, 1970	High school education	7/25 (28) With organic pathology	12/27 (44.4)	0.38	0.12-1.2	0.1
Harrop Griffiths, 1988	Education (Hollingshead index)	M 3.1, sd 1.1	M 2.4, sd 1.2	0.7		0.03
Hodgkiss, 1994	Lower social class (IV-V)	12/29 (41.38)	10/33 (30.3)	1.62	0.57-4.63	0.52

M=mean, sd- standard deviation

Appendix 3.14: Table of Compliance of 'Factors predisposing women to chronic pelvic pain: A Systematic Review' with The MOOSE Checklist

Item	Complied	Section
Reporting of background should include		
Problem definition	Yes	Background
Hypothesis statement	Yes	Background
Description of study outcome(s)	Yes	Study selection criteria
Type of exposure or intervention used	No	N/A
Type of study designs used	Yes	Study selection criteria
Study population	Yes	Study selection criteria
Reporting of search strategy should include		
Qualifications of searchers (e.g. librarians and investigators)	Yes	Acknowledgements
Search strategy, including time period included in the synthesis and keywords	Yes	Methods
Effort to include all available studies, including contact with authors	Yes	Methods
Databases and registries searched	Yes	Methods
Search software used, name and version, including special features used (e.g. explosion)	Yes	Methods
Use of hand searching (e.g. reference lists of obtained articles)	Yes	Methods
List of citations located and those excluded, including justification	Yes	Figure 1 Appendix 4
Method of addressing articles published in languages other than English	Yes	Data extraction
Method of handling abstracts and unpublished studies	No	Data extraction
Description of any contact with authors	Yes	Data extraction
Reporting of methods should include		
Description of relevance or appropriateness of studies assembled for assessing the hypothesis to be tested	Yes	Study selection
Rationale for the selection and coding of data (e.g. sound clinical principles or convenience)	Yes	Study selection
Documentation of how data were classified and coded (e.g. multiple raters, blinding, and interrater reliability)	Yes	Data extraction

Assessment of confounding (e.g. comparability of cases and controls in studies where appropriate)	Yes	Methods
Assessment of study quality, including blinding of quality assessors; stratification or regression on possible predictors of study results	Yes	Results
Assessment of heterogeneity	Yes	Results
Description of statistical methods (e.g. complete description of fixed or random effects models, justification of whether the chosen models account for predictors of study results, dose-response models, or cumulative meta-analysis) in sufficient detail to be replicated	Yes	Data synthesis
Provision of appropriate tables and graphics	Yes	Can be provided if required/requested
Reporting of results should include		
Graphic summarising individual study estimates and overall estimate	Yes	Figure 3-5, Results
Table giving descriptive information for each study included	Yes	Table 1, 2,3
Results of sensitivity testing (e.g. subgroup analysis)	Yes	Results
Indication of statistical uncertainty of findings	Yes	Results
Reporting of discussion should include		
Quantitative assessment of bias (e.g. publication bias)	Yes	Discussion
Justification for exclusion (e.g. exclusion of non–English-language citations)	Yes	Figure 1
Assessment of quality of included studies	Yes	Discussion
Reporting of conclusions should include		
Consideration of alternative explanations for observed results	Yes	Discussion
Generalisation of the conclusions (i.e. appropriate for the data presented and within the domain of the literature review)	Yes	Discussion
Guidelines for future research	Yes	Discussion
Disclosure of funding source	Yes	Funding source

Appendix 4: No supplementary information for chapter 4

Appendix 5: Supplementary information for chapter 5

Appendix 5.1: Survey of clinicians' beliefs on efficacy of LUNA

We would like your help with a study that we are undertaking of how results of clinical trials influence clinicians' beliefs about the treatments being tested. As part of this study we would like to find out, before any results from LUNA are available, what clinicians believe the likely benefits from Laparoscopic Uterosacral Nerve Ablation are.

This questionnaire assumes you have been involved / are interested in the LUNA trial, and so are familiar with the clinical issues and uncertainties involved in Laparoscopic Uterosacral Nerve Ablation. If you are not familiar with the clinical issues, please do NOT fill in this form.

The aim is to obtain your beliefs about the likely effectiveness of LUNA in reducing pelvic pain, compared to 'placebo' (i.e. laparoscopic examination alone). Please consider for a moment what your beliefs about this are now (before results from the LUNA trial are available).

Remember there are no right or wrong answers here. We don't know the answers to these questions any more than you do.

We want to make it as easy as possible for you to represent your beliefs about the efficacy of LUNA. If there is anything you don't understand about the task, or if you

can suggest a way to make it easier, or to explain it better, we will be very glad to have your comments. There is space at the end of the questionnaire with this in mind.

An example: efficacy of LUNA to reduce pain

Suppose a clinician is asked to predict what the true benefit of LUNA is likely to be in reducing pain in suitable patients. Pain is to be measured using a Visual-Analogue Scale (VAS) from 0 to 10, with 0 = no pain, 10 = greatest conceivable pain. The outcome to be predicted is the mean extra reduction (before - after) in VAS scores in patients receiving LUNA, compared to the mean reduction in patients receiving placebo treatment. Thus, if the true mean change in VAS score in patients treated with LUNA were a reduction of 1.3 in pain score, while the true mean change in similar patients treated with placebo were an increase of 0.2, then the true benefit from LUNA would be 1.5. On this scale, an improvement of 0.5 to 1.0 points would be a small benefit, an improvement of 1.5 to 2.0 points would be a moderate benefit, and an improvement of 2.5 point or more would be a substantial benefit.

Example:

The clinician believes that the most likely benefit from LUNA in suitable patients is (on average) zero (i.e. negligible benefit or harm)

She should first mark the zero benefit line somewhere towards the right of the page.

If she believes that a mean 1.5 point or more disadvantage (i.e. LUNA moderately worse compared to placebo) is virtually impossible, she should mark the −1.5 and −2.0 lines at or very close to the left end.

Similarly, if she believes a mean benefit of 3.0 points or more (i.e. LUNA substantially better compared to placebo) is extremely unlikely, she would mark the last line at the left-hand end.

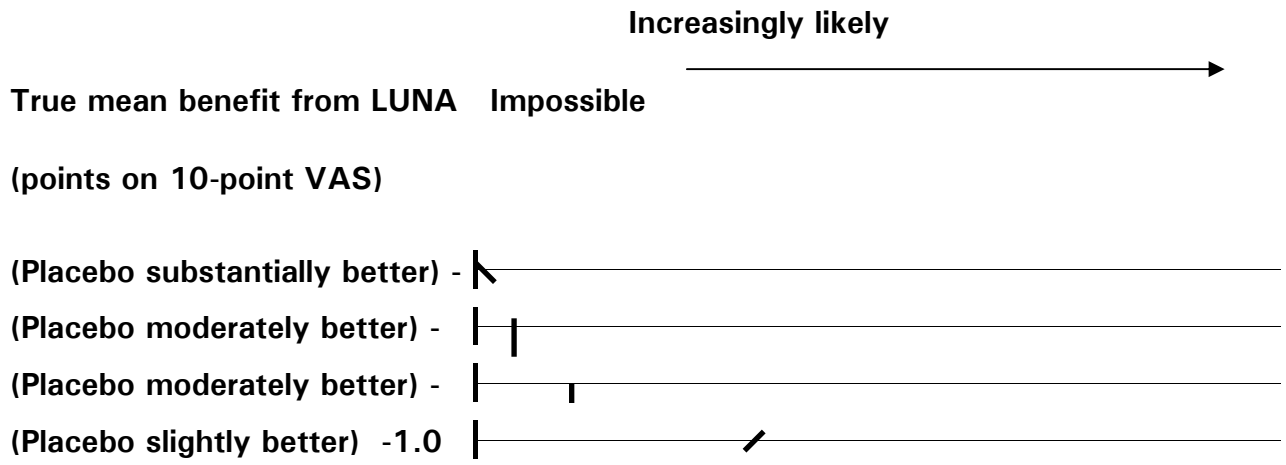
She then needs to consider how much less likely than zero mean benefit she thinks −0.5 and +0.5 are. Suppose she thinks +0.5 (i.e. a small benefit) is about half as likely, while −0.5 (i.e. a small disbenefit) is about a quarter as likely. Then she should mark these lines roughly as below.

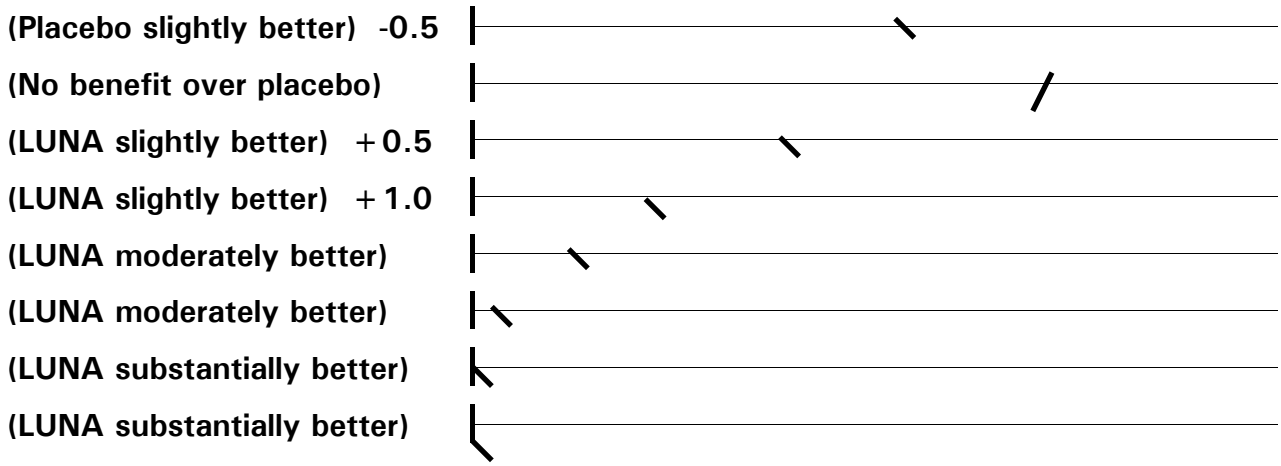
NOTES:

No one knows the truth; we are interested in what the clinician believes the truth may be.

There are no constraints on the 'shape' of the distribution – it doesn't have to be symmetric.

Don't worry about getting the distribution 'perfect' – very few people will be absolutely certain about what their beliefs are anyway. Don't try and copy *this* distribution of beliefs in any way – a statistician who knows almost nothing about the issues involved invented it!





Assume patients have chronic pelvic pain, and are otherwise generally similar to LUNA trial participants (i.e. no pelvic pathology, major endometriosis or adhesions, and no contraindications for LUNA)

Please use the form below to record your beliefs, using all the information you are aware of, about what the **true effect** of LUNA in such patients is likely to be. The benefit to be judged is the difference between the mean improvement in VAS pain score in patients receiving LUNA, and the mean improvement in patients receiving placebo.

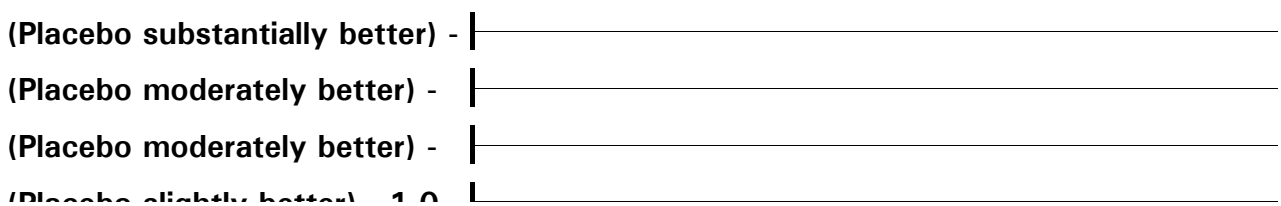
You are not asked to predict the outcome of the LUNA trial but, rather, **the truth** – i.e. the result that would emerge from a trial with many thousands of patients included.

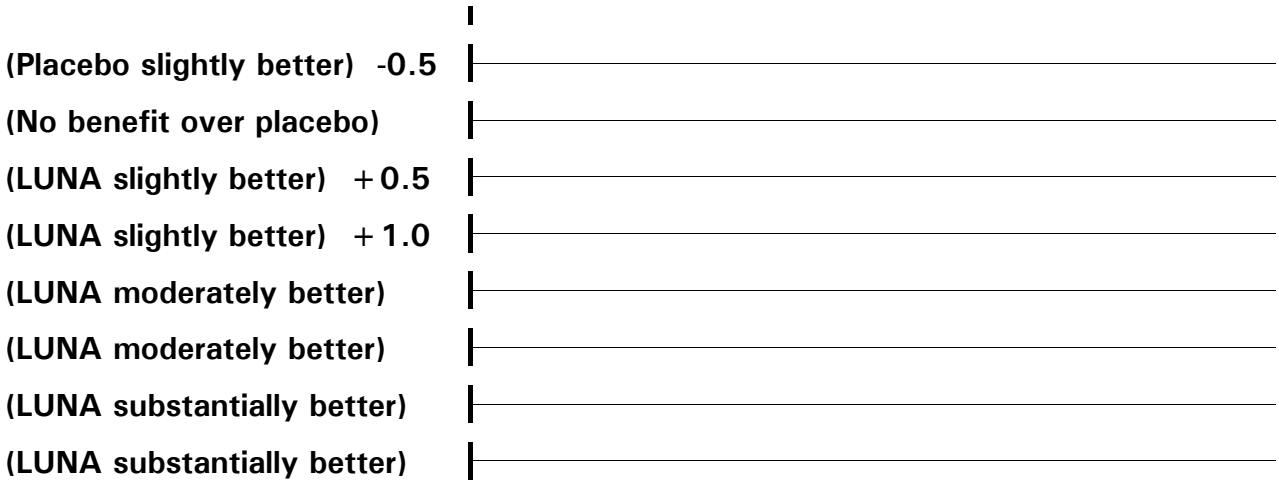
- **Each horizontal line below represents a possible true benefit from LUNA treatment in terms of the mean reduction in VAS pain score**
- **Draw a vertical line through each line to show how *relatively* likely you think that possibility is to be the truth.**
- **Make your mark further to the right if you consider the possibility more likely.**
- **Start with the possibility you consider most likely to be true and mark the others relative to it.**
- **A mark half as far from 'Impossible' (on the left) for one degree of benefit as for another means you think it is half as likely that it will turn out to be *true*.**

Efficacy of LUNA for patients with chronic pelvic pain

True mean benefit from LUNA

(points on 10-point VAS) **Impossible** → **Increasingly likely**




(Placebo slightly better) -0.5
(No benefit over placebo)
(LUNA slightly better) +0.5
(LUNA slightly better) +1.0
(LUNA moderately better)
(LUNA moderately better)
(LUNA substantially better)
(LUNA substantially better)

This last sheet is to ask whether you found the form easy to follow and use, and if not where improvements are needed. Previous versions of the form have successfully confused and bewildered some of the cleverest people we know, so please don't be shy about admitting to finding aspects of it less than crystal clear – if so, it is our fault not yours.

It would be very helpful to us if you could put your name and contact details here. This is primarily so that we can ask you to fill in *more* of these forms after the results of the LUNA trial are known. We may also like to ask some respondents further questions about their beliefs about LUNA, and about problems with completing the form.

Name, Title:

Contact (phone number / e-mail / address):

.....

.....

.....

.....

.....

I am willing to consider requests to fill in more of these forms Yes / No

I am / am not willing for you to write / e-mail / phone me (delete as required) about this questionnaire

Please tick/circle the appropriate responses

1. Do you believe that the true mean effect of LUNA on pain, compared to placebo, is (circle the single response closest to your beliefs – or write in your own description if none fit very well)

Probably harmful or of no benefit

Probably negligible benefit or harm (near zero)

Probably slightly beneficial (0.5 to 1.0 reduction in VAS)

Probably moderately beneficial (1.5 to 2.0 reduction)

Probably substantially beneficial (2.5 or more reduction)

Probably beneficial, but not sure how much (0.5 or more reduction)

Unsure whether beneficial or not, but not harmful (zero or more reduction)

Unsure whether harmful or beneficial

2. Could you briefly say what has influenced these beliefs?

.....

.....

.....

3. Do you think the efficacy of LUNA differs with the location of pain?

Yes/No

4. If yes- Do you believe that it works better for

a) central b) lateral pain

5. Do you think LUNA works better for

a) no pathology b) minimal pelvic pathology c) both equally well

6. Did/do you find the concept of 'the truth' about the efficacy of LUNA difficult? (E.g. distinguishing it from the result of the LUNA trial).

.....

.....

7. Did you find the description of the comparative measure of benefit (difference in mean change of VAS scores, page 2): very confusing / not very helpful / clear after a little thought / immediately clear.

8. Did you find the 'LUNA' example: very helpful / helpful / worth having / not worth having

.....

.....

9. Any other comments, written or verbal, now or later, very much appreciated.

.....

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Appendix 6: Supplementary information to Chapter 6: Effectiveness of neuroablation in chronic pelvic pain (Dysmenorrhoea): Update of Cochrane Review

Appendix 6.1: Table of characteristics of studies included in the systematic review on effectiveness of neuroablation in dysmenorrhoea

No	Study	Methods	Participants	Interventions	Outcomes	Notes
1	Candiani 1992	Allocation Concealment: unclear Randomisation: details unreported Blinding: unclear Power Calculation: sample size based on assumption that dysmenorrhoea would resolve in 50% controls and 80-90% PSN group. Number of included patients gives 80% power for a difference of 30% 90% power for a difference of 40%, 0.05 level of sig. Duration of trial: Recruitment from June 1986 to Jan 1990. Follow-up of all women for at least one year.	Number of women randomised: 78 Number of women analysed: 71 Drop-outs/withdrawals: 7 women did not accept randomisation. Inclusion criteria: women with endometriosis stage III or IV undergoing conservative surgery, moderate or severe midline or midline and lateral menstrual pelvic pain (dysmenorrhoea). Diagnosis: gastro, urologic and orthopaedic evaluation to exclude other causes of pelvic pain, endometriosis confirmed at surgery. Age: Control group mean 31.1, sd 3.6; PSN surgery group mean 32.5, sd 4.2 Location: Milan, Italy	Treatment: presacral neurectomy with conservative surgery for endometriosis Control: conservative surgery for endometriosis	Dysmenorrhoea, measured by a 0-10 analogue scale and by a multidimensional scale that included limitation of working ability, systemic symptoms, and need for analgesics. Data reported as mild, moderate or severe pain prior to surgery and 12 months following surgery. Adverse effects.	
2	Chen 1996	Allocation Concealment: unclear Randomisation: unclear, stated as randomised no further details given Blinding:	Number of women randomised: 68 Number of women analysed: 68 Drop-outs/withdrawals: none Inclusion criteria: women with	Treatment: Laparoscopic uterine nerve ablation Control: Laparoscopic presacral neurectomy	Pain relief measured on a 5-point scale (0 = no pain to 4 = incapacitating pain unresponsive to potent pain relievers and the	

		unclear Power Calculation: none stated Duration of trial: Recruited from Jan 1992 to July 1993. Patients followed-up for 12 months.	primary dysmenorrhoea and/or chronic pelvic pain. Exclusion criteria: pelvic pathology (lesions) Diagnosis: at laparoscopy, those without lesions that could be assoc with dysmenorrhoea were randomised Age: 18 to 40 years Location: Taiwan		inability to function). Pain was measured at baseline, 3 months, 12 months and data was dichotomised into success 100>50% pain relief or failure 50->0% pain relief. Adverse effects.	
3	Johnson 2004	Allocation concealment: Stated as maintained securely by storage in sealed, sequentially-numbered opaque envelopes until the interventions were assigned during the laparoscopic procedure Randomization: computer generated random number sequences Blinding: used; participant and investigator blinded throughout the study Power Calculation: For women with chronic pelvic pain in the absence of endometriosis, in order to have 80% power at the 95% confidence level to detect benefit in 50% of women,	Number of women randomised: 123 Number of women analysed: 123 Drop-outs/withdrawals: 14 were excluded based on laparoscopic findings Loss to follow up: 24 hours: 1 3 months: 3 (2 LUNA and 0 no LUNA in the population with no endometriosis; 0 LUNA and 1 no LUNA in the endometriosis population). 12 months: 17 (4 LUNA and 2 no LUNA in the population with no endometriosis; 6 LUNA and 5 no LUNA in the endometriosis population) Inclusion criteria: Women aged 18 to 45 years inclusive; a history of chronic pelvic pain (either dysmenorrhoea, non-menstrual pelvic pain, defaecatory pain or deep dyspareunia for	2 groups: *Group with endometriosis*: Treatment: LUNA with conservative surgery for endometriosis Control: Conservative surgery for endometriosis *Group without endometriosis* Treatment: LUNA at laparoscopy Control: Laparoscopy alone	Changes in non-menstrual pelvic pain, dysmenorrhoea, deep dyspareunia and dyschezia were assessed primarily by whether there was a decrease in visual analog score for these types of pain of 50% or more from baseline; additionally whether there was a significantly different change in median visual analog score. The numbers requiring further surgery or starting a new medical treatment for pelvic pain and complications were also measured. Adverse effects: No important intraoperative or postoperative complications occurred (specifically there were no cases of ureteric injury,	137/200 agreed to participate; 14 excluded at laparoscopy; follow up at 12 months: 106/123 (86.2%)

		assuming 'benefit' in 10% controls, at least 48 participants would be required for analysis following randomisation. For women with endometriosis, in order to have 80% power at 95% confidence level to detect benefit in 90%, assuming benefit in 60% controls undergoing conventional endometriosis surgery,at least 76 participants would be required for analysis following randomisation. Allowing for losses to follow-up, it was planned to recruit 50 women with chronic pelvic pain in the absence of endometriosis and 80 women with endometriosis. Duration of trial: April 1997 to Dec. 2001. Follow-up: 24 hours, 3 and 12 months	more than 6 months); no change in medication for the 3 months prior to trial recruitment. Exclusion criteria: previous hysterectomy or pelvic malignancy; previous LUNA; known ovarian cysts; plan for a pregnancy within 12 months; intention to change other medical treatment which could influence pelvic pain scores within 12 months; laparoscopic findings rendering LUNA impossible (for example frozen pelvis with no access to uterosacral ligaments) or the finding of pelvic adhesions which did not appear to be due to endometriosis. Location: Auckland, New Zealand		intraoperative bleeding nor postoperative haematoma formation), other than 2 women who had urinary retention requiring catheterisation within 24 hours of the surgery (both in the endometriosis population not undergoing LUNA)	
4	Lichten 1987	Allocation concealment: inadequate Randomisation: Randomised by last digit of medical case number on day	Number of women recruited: 39. 18 were excluded due to pathology (endometriosis, PID) Number of women randomised: 21	Treatment: Laparoscopic uterine nerve ablation Control: Diagnostic laparoscopic surgery only	Pain was measured on a five point scale (0 = no pain to 4 = incapacitating pain unresponsive to potent pain	

		of surgery. Blinding: Both participant and clinical psychologist, who recorded outcomes, were blinded. Power Calculation: none stated Duration of trial: 12 mo	Number of women analysed: 21 Drop-outs/withdrawals: none Inclusion criteria: women with severe dysmenorrhoea and no improvement with at least 2 NSAIDs and an oral contraceptive (30 and 50 ug of estrogen only) concurrently. Exclusion criteria: history of psychotherapy, major abdominal procedures, drug abuse or demonstrable pelvic pathology. Diagnosis: diagnostic laparoscopy Age: 18-34 yrs Location: USA		relievers and the inability to function). Pain scores for each patient were reported preoperatively and at 3mths and 12mths. Adverse effects.	
5	Sutton 2001	Allocation Concealment: unclear Randomisation: computer generated randomisation sequence Blinding: double; participant and research nurse. Power Calculation: done; sample for 90% power was 22 women in each group Duration of trial: Women assessed at 3 and 6 months post op (recruitment occured over 33 months Feb.1995 to Nov. 1997).	Number of women randomised: 51 Number of women analysed: 46 at 6 months Drop-outs/withdrawals:5 (1 became pregnant and 4 were lost to follow up). However data points for to 14 women were missing for some analyses Inclusion criteria: women with history and physical or laparoscopic examination suggestive of endometriosis who had not received medical treatment for endometriosis within the last 6 months, and had not previously undergone	Treatment: LUNA with laparoscopic treatment of all visible endometriosis Control: laparoscopic treatment of all visible endometriosis	Dysmenorrhoea, measured by linear analogue scale (0-10) and pain scoring questionnaire Adverse effects: None	

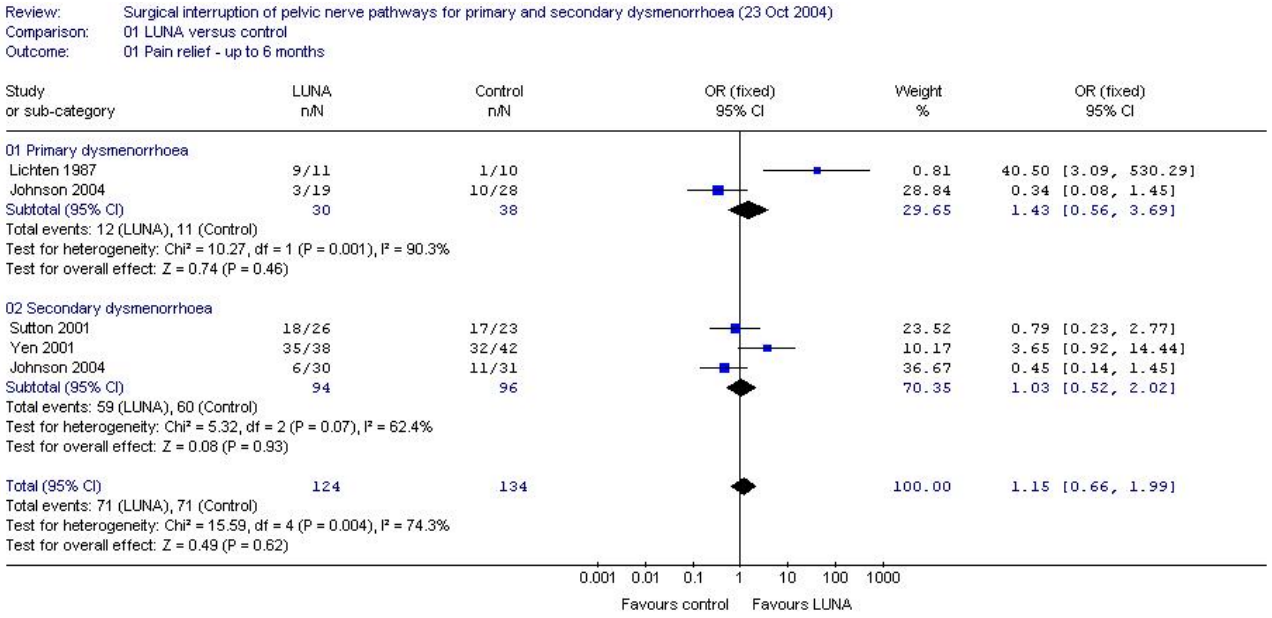
			surgical treatment of their disease Exclusion criteria: stage IV disease or any other pathology that may have been responsible in whole, or in part for their symptoms Diagnosis: At laparoscopy those with stage IV disease or other pathology were excluded Age: mean 28 (20-41) Location: Surrey, UK			
6	Tjaden 1990	Allocation concealment: unclear Randomisation: Centralised randomisation process, with sealed, opaque, sequentially numbered, identical envelopes. Blinding: single; randomised participants were blinded Power Calculation: none stated Duration of trial: 6 months post-op; however follow-up continued for a minimum of 42 months.	Number of women randomised: 8; also 18 women not randomised but followed-up Number of women analysed: 26 Drop-outs/withdrawals: none Inclusion criteria: women with moderate to severe dysmenorrhoea scheduled to undergo laparotomy for conservative resection of endometriosis. Diagnosis: initial detailed history of pain and anatomical diagram for localisation of dysmenorrhoea, endometriosis confirmed at laparotomy. Age: mean 30 yrs Location: USA	Treatment: Presacral neurectomy and resection of endometriosis. Control: resection of endometriosis only.	Relief of pain was reported as the number of women with pain relief in 3 locations. Adverse effects.	Data analysed pooled, and split into protocol (randomised) and non-protocol (non randomised) groups. Study stopped by monitoring committee after 26 participants, as it was considered unethical not to provide those with midline dysmenorrhoea the pain relief that PSN exhibited.
7	Vercellini 2003	Allocation concealment: unclear Randomisation: computer generated randomisation	Number of women randomised: 180 Number of women analysed: 116 Drop-outs/withdrawals: 29 pregnant, 14	Treatment: Conservative laparoscopic surgery with the addition of uterosacral ligament	Dysmenorrhoea, measured by a 100 mm visual analog scale that ranged from "least possible pain" to "worst	Proportion of women satisfied with the treatment were similar

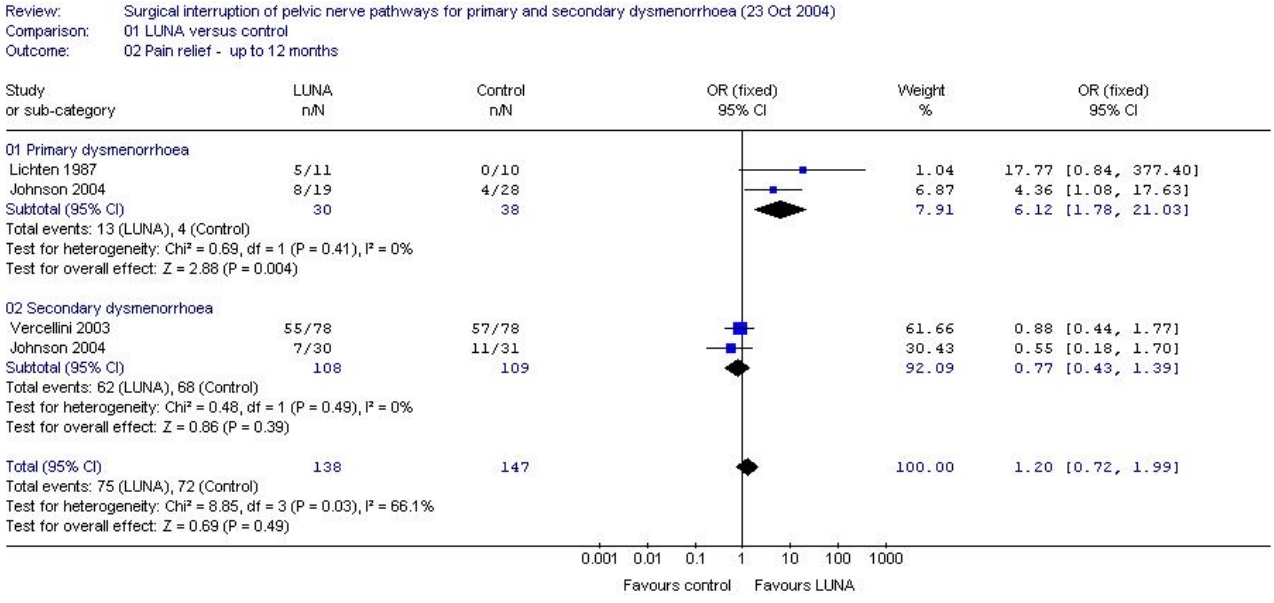
		in single blocks Blinding: used; patient and investigator blinded throughout the study Power Calculation: sample size based on assumption that dysmenorrhoea would reoccur in 30% of the controls and 10% of the treatment group. 72 patients were needed in each group to demonstrate a difference of 20% between control and treatment groups and to define statistical significance between the groups with an alpha of 0.05 and beta of .20. Duration of trial: Sept. 1998 to Oct 2001. Follow-up: 6 and 12 months	used oral contraception, 15 lost to follow-up, 6 miscellaneous reasons. Inclusion criteria: Aged 18-40, undergoing first-line operative laparoscopy for symptomatic minimal to severe endometriosis who reported pelvic pain of more than 6 months duration. Exclusion criteria: previous diagnosis of endometriosis, other diseases that might cause pelvic pain, treatment for endometriosis other than nonsteroid anti-inflammatory drugs up to 6 months before entry in the study, presence of vaginal endometriotic lesions, previous diagnosis of gastrointestinal, urologic and orthopedic diseases in which pain may radiate to the pelvic area, known psychiatric disturbances Age: 18-40. mean for each group not given Location: Milan, Italy	resection Control: Conservative laparoscopic surgery	possible pain". Frequency was expressed as the number of episodes per each cycle for dysmenorrhoea and chronic pelvic pain. Hospital anxiety and depression scale, sexual rating scale, SF 36 Adverse effects: None attributable to pelvic denervation	
8	Yen 2001	Allocation concealment: inadequate Randomisation: Women with even hospital nos.(assigned on the day of surgery) were cases and those with odd hospital nos. were controls.	Number of women randomised: 85 Number of women analysed: 80 at 1, 3 and 6 months Drop-outs/withdrawals:5 (1 in each group had procedure converted to abdominal hysterectomy due to adhesions, 1	Treatment: Laparoscopic uterine nerve ablation with laparoscopic bipolar coagulation of uterine vessels (LBCUV) Control: LBCUV	Dysmenorrhoea, improvement measured by analgesic use, and scale - completely resolved, significantly improved, slightly improved, unchanged or worsened. Pain	

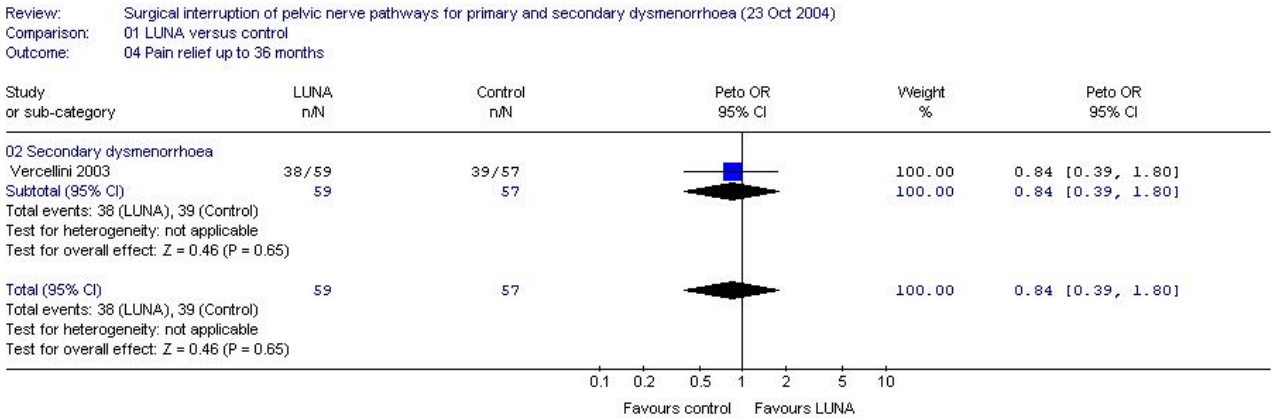
		Blinding: double; patient and clinical psychologist Power Calculation: not stated Duration of trial: follow-up at 1, 3 and 6 months	became pregnant and 2 were lost to follow-up). Inclusion criteria: women with symptoms of uterine myomas, including dysmenorrhoea, menorrhagia, and bulk related symptoms, documented absence from school or work due to dysmenorrhoea and no response to OC or NSAIDS for at least two cycles. Exclusion criteria: history of psychotherapy, major abdominal surgery or drug abuse Diagnosis: ultrasound Age: Control group mean 43.1, sd 5.1; Treatment group mean 44.5, sd 4.4 Location: Taipei, Taiwan		data was reported the numbers of women slightly, significantly or completely improved. Adverse effects.	
9	Zullo 2003	Allocation concealment: unclear Randomisation: computer generated randomisation in single blocks Blinding: double; participant and investigator blinded throughout the study Power Calculation: sample size based on assumption that dysmenorrhoea would resolve in 50% controls, 58	Number of women randomised: 141 Number of women analysed: 126 Drop-outs/withdrawals: 7 due to the presence of other gynaecological diseases, 5 because endometriosis was not confirmed, 3 failed to undergo postoperative subjective evaluation of dysmenorrhoea. Inclusion criteria: sexually active women of fertile age with severe dysmenorrhoea for more than six	Treatment: presacral neurectomy with conservative surgery for endometriosis Control: conservative surgery for endometriosis	Dysmenorrhoea, measured by a 100 mm visual analogue scale that ranged from "least possible pain" to "worst possible pain". Frequency was expressed as the number of episodes per each cycle for dysmenorrhoea and chronic pelvic pain. Adverse effects: Significant bleeding from middle sacral vein in 1 woman in treatment group, initial urinary retention	

		women were needed in each group to demonstrate a difference of 25% between control and experimental groups and to define statistical significance between the groups with an alpha of 0.05 and beta of .20. Duration of trial: Sept. 1998 to Oct 2001. Follow-up: 6 and 12 post op.	months who were unresponsive to medical treatment and had a clinical and/or ultrasonographic diagnosis of endometriosis. Exclusion criteria: pregnancy, women without midline dysmenorrhoea, breastfeeding, use of an intrauterine device, major medical diseases, psychiatric disorders, neurologic alterations of the lumbar-sacral tract, previous pelvic surgery, history of severe abdominal or pelvic infection, presence of other gynaecologic diseases, body mass index of >30 kg/m2, history of alcohol or other drug abuse. Age: (mean ± SD) Group A 31.8 ± 4.9 Group B 30.1 ± 3.7Location: Catanzaro, Rome and Messina, Italy Age: Control group mean 31.8, sd 4.9; PSN surgery group mean 30.1, sd 3.7 Location: Catanzaro, Rome and Messina, Italy		in 2 women in treatment group; significant increase in operating time in treatment group ($p<0.05$)	

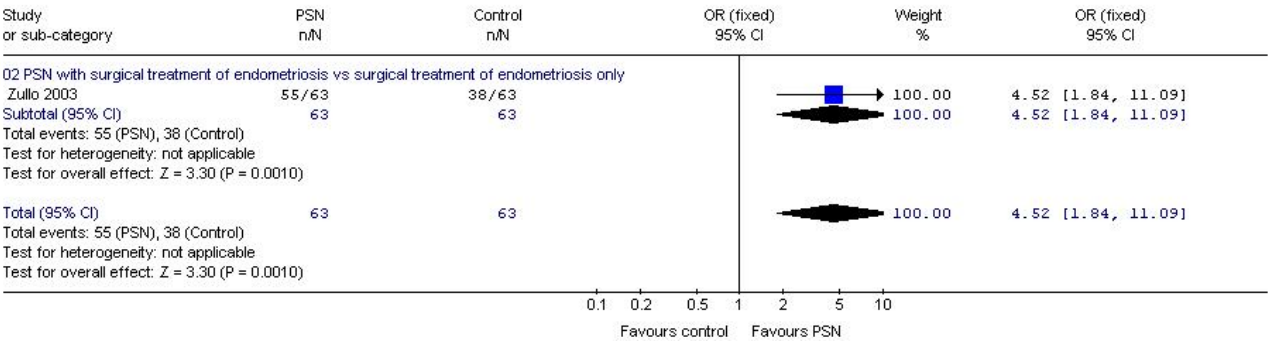
Appendix 6.2: Results from studies on effectiveness of neuroablation



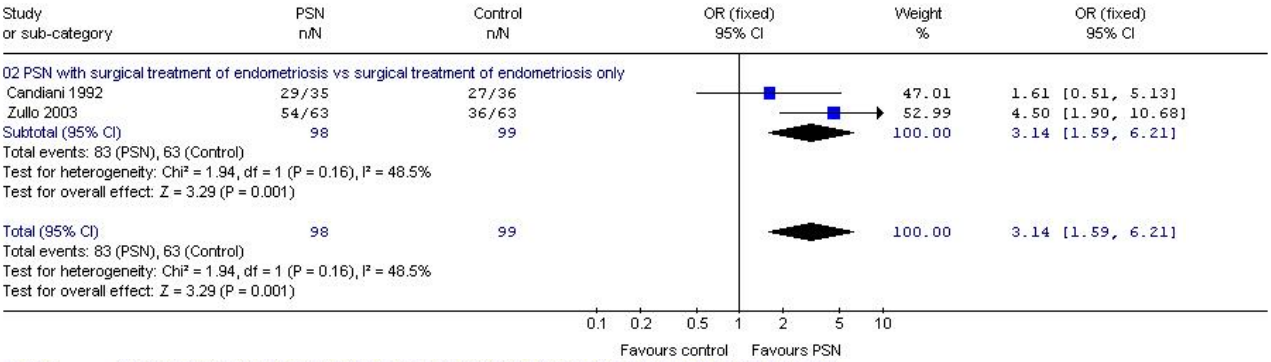




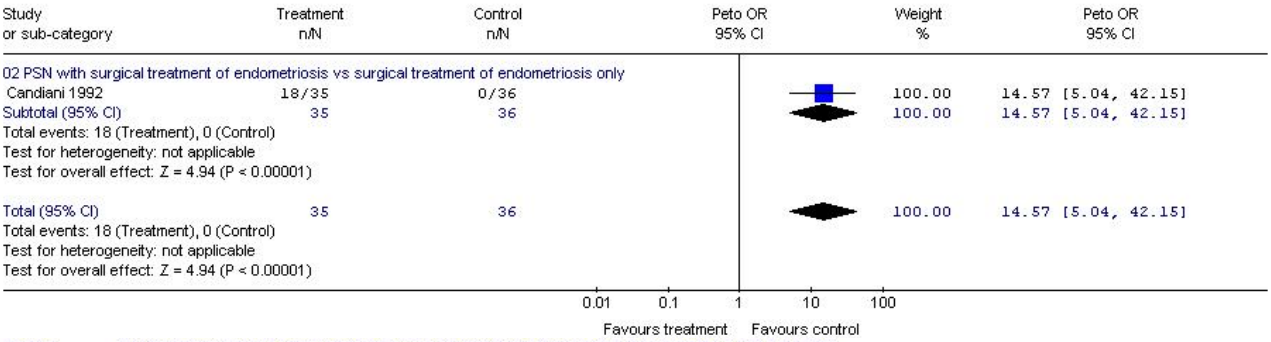
Review: Surgical interruption of pelvic nerve pathways for primary and secondary dysmenorrhoea (23 Oct 2004)
Comparison: 02 PSN versus control
Outcome: 01 Pain relief - up to 6 months



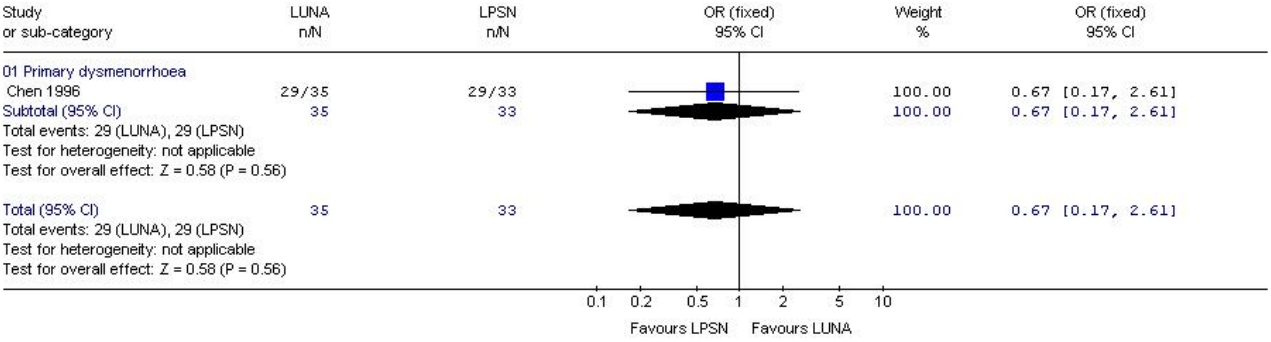
Review: Surgical interruption of pelvic nerve pathways for primary and secondary dysmenorrhoea (23 Oct 2004)
Comparison: 02 PSN versus control
Outcome: 02 Pain relief - up to 12 months



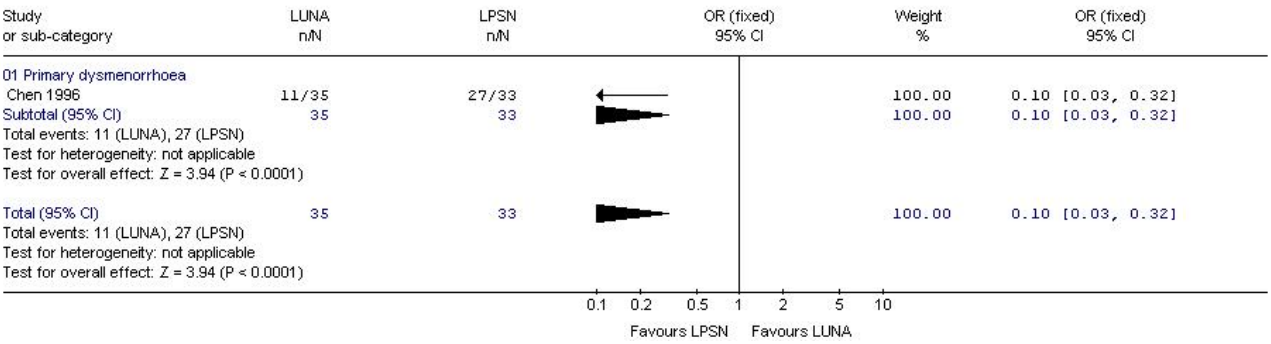
Review: Surgical interruption of pelvic nerve pathways for primary and secondary dysmenorrhoea (23 Oct 2004)
Comparison: 02 PSN versus control
Outcome: 03 Adverse effects



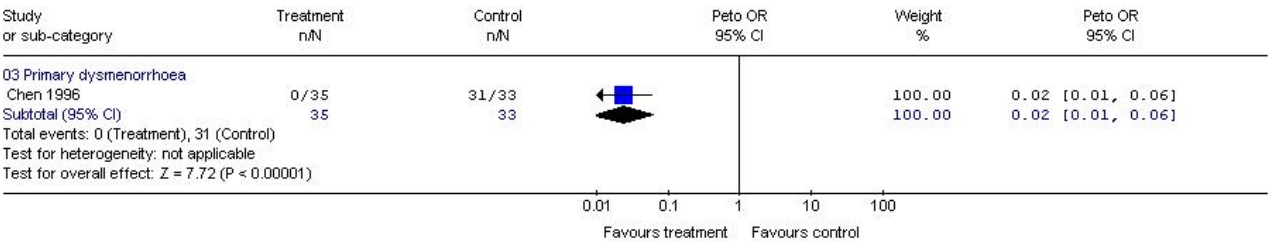
Review: Surgical interruption of pelvic nerve pathways for primary and secondary dysmenorrhoea (23 Oct 2004)
Comparison: 03 LUNA versus LPSN
Outcome: 01 Pain relief - up to 6 months



Review: Surgical interruption of pelvic nerve pathways for primary and secondary dysmenorrhoea (23 Oct 2004)
Comparison: 03 LUNA versus LPSN
Outcome: 02 Pain relief - up to 12 months



Review: Surgical interruption of pelvic nerve pathways for primary and secondary dysmenorrhoea (23 Oct 2004)
Comparison: 03 LUNA versus LPSN
Outcome: 03 Adverse effects



Appendix 6.3: Table of compliance of the neuroablation in dysmenorrhoea: systematic review of effectiveness with the QUOROM checklist

	Subheading	Reported (Y/N)	Page number
Abstract			
	Objectives	Y	
	Data sources	Y	
	Review methods	Y	
	Results	Y	
	Conclusion	Y	
Introduction		Y	
Methods	Searching	Y	
	Selection	Y	
	Validity assessment	Y	
	Data abstraction	Y	
	Study characteristics	Y	
	Quantitative data synthesis	Y	
Results	Trial flow	Y	
	Study characteristics	Y	
	Quantitative data synthesis	Y	
Discussion		Y	

Appendix 7: Supplementary information for chapter 7: The LUNA Trial Protocol

Appendix 7.1: LUNA Trial patient information sheet

Invitation to take part in the LUNA Study

Your consultant will have explained to you that you need a laparoscopy (a telescope examination of your pelvis under general anaesthetic) to try to find out the cause of your pelvic pain. If there is an obvious cause for the pain then we will treat it. But if there is no obvious cause then we would like to invite you to take part in a study looking at a simple procedure called LUNA, which may help cure your pain. This would be done at the same time as your laparoscopy. Participation in this study is entirely voluntary. Over 400 women, who like you have had persistent pelvic pain, will take part in the study. Half will be randomly allocated to have LUNA and the other half not to have this treatment. We will then compare the two groups to find out whether LUNA helps reduce pain. Women in the study will not be told which group they are in because we don't want this to influence how they feel after the operation. This is called 'blinding' and allows us to trust the results we obtain from the study.

What is LUNA?

LUNA stands for Laparoscopic Uterosacral Nerve Ablation. Some of the nerves coming from your womb are responsible for carrying the pain to the brain. LUNA cuts these nerves, using a small needlepoint electric current or a laser. This simple procedure is being used safely for other conditions, including endometriosis (a condition where the lining of the womb is found elsewhere in the pelvis and can cause pelvic pain). We need this trial of LUNA because doctors are not certain whether it will help women who don't have endometriosis.

Will LUNA help me?

We don't know yet. By taking part in this trial, you will help us find this out so that women in the future obtain the best treatment for their condition. You may benefit personally if you are allocated to have LUNA and this does prove to be the better treatment. In this case, women who were not allocated LUNA will be offered the option to have LUNA at a later date if they still have pelvic pain. On the other hand, LUNA may not improve the pain much, in which case it may be best not have this treatment.

Are there any other treatments for pelvic pain?

Several types of drugs are used for pelvic pain and you will probably have tried some of them already. You probably will have been referred to the gynaecology clinic because these treatments were not very effective. Whether or not you have LUNA, after your laparoscopy, you and your doctor will continue to have complete freedom to choose any drugs you wish for pain relief.

What happens during the laparoscopy?

You will be put to sleep under general anaesthetic and have air introduced into your abdomen by a small needle near your navel. This enables a fibre-optic telescope to be inserted via a second small cut beneath your navel. The consultant will examine your pelvic area and reproductive organs to see if you have any obvious reason for your pain, such as endometriosis or pelvic inflammatory disease. If this is the case, you will be treated for these conditions as appropriate.If the consultant finds no obvious cause for your pain and the nerves that carry pain are accessible for surgery, then you will be randomly allocated LUNA or no LUNA. If you have LUNA, the nerves will be cut, using a thin surgical instrument inserted via a third incision in your lower

abdomen. Whether or not you receive LUNA, this third incision will be made anyway. If we did not do this you would be able to tell which treatment you had had by counting the number of incisions and this might influence the way you feel about your pain after the operation. The surgery should not result in any noticeable discomfort. The three cuts will be very small, approximately half a centimetre long, and may not even require stitches. If stitches are required, they may be self-absorbing and may not require removing later. There should be minimal scarring from these incisions under normal circumstances.

What are the risks of taking part?

Although LUNA is a safe procedure, like any other laparoscopic procedure, it is not without risks. One of the reasons we are running this trial is to monitor and measure the risks of complications. These include possible damage to organs around the abdomen around the site of LUNA and a hypothetical risk of prolapse of the womb. However, the chances of these complications are very small. Also, we only allow experienced surgeons to take part.

What else will I be asked to do?

Before you have the surgery, you will be asked to complete a questionnaire to assess how much pain you are in and how this pain affects you. The same questionnaire will be sent to you at home 3 and 6 months and 1, 2, 3, 5 and 10 years after the surgery. You will not need to make any special trips back to the hospital. Even if you could not take part in the LUNA part of the trial, because you had other conditions or the nerves were not accessible for surgery, we would like you to complete the questionnaires at 6 and 12 months after the laparoscopy. The questions are designed to find out if there are any improvements in your pelvic pain following the laparoscopy.

There are four parts to the questionnaire - your assessment of your pelvic pain, what additional treatment you have taken for your pain, questions on how it affects your sexual relationships and some questions to determine your overall state of health and quality of life. The results of the trial will be reported once everyone in it has reached the one-year time point after surgery. If the results show a definite benefit or risk from LUNA, we will write and let you know. We would, however, like you to complete the same questionnaires 2, 3, 5 and 10 years after the surgery to see if the effects of the treatment are long-lasting.

What are my rights?

You have the right to be given all-important information about your condition, your treatment, the LUNA study and what you will be asked to do if you decide to take part. You should only agree to take part if you feel happy that you know enough about all these things. You do not have to take part in the study if you do not want to. If you decide not to, this will not affect the treatment you receive from your doctors and they will not think bad of you. If you do agree to take part, you are entitled to withdraw from the study at any time without having to give a reason, although it would be useful to know why. This will not affect your medical care in any way either.

Whether or not you take part in the study, you have the right to confidentiality of your medical records (although we will inform your GP that you are taking part in the LUNA study, unless you object). If you agree to take part, your doctor will send basic information about you and your disease to the study's central organisers at the University of Birmingham Clinical Trials Unit to allow the results to be analysed. The information will be kept securely and in strict confidence. The questionnaires will be

identified only by a code number and will not be seen by your doctor. No named information about you will be published in the trial report.

If there are any questions, you can ask your gynaecologist or nurse, whose details are on the cover sheet.

Alternatively you can contact:

Dr. Pallavi Latthe or Mr Khalid Khan
Birmingham Women's Hospital,
Metchley Park Road,
Edgbaston,
Birmingham B15 2TG
http://www.luna.bham.ac.uk

Tel: 0121 607 4712
Mobile: 07733002768
Email: bctu@bham.ac.uk

Appendix 7.2: Consent form

LUNA
PATIENT CONSENT FORM

A RANDOMISED CONTROLLED TRIAL TO ASSESS THE EFFICACY OF LAPAROSCOPIC UTEROSACRAL NERVE ABLATION (LUNA) IN THE TREATMENT OF CHRONIC PELVIC PAIN

I ..... agreed to take part in the LUNA study, which has been explained to me by Dr. .....

The explanation included

- A patient information sheet (Version 4 Date: 22nd August 2003) which I have read, understood and accepted

- The purpose and length of the study

- What the study involves, if I take part

☐ I understand that I am free to withdraw from this study at any time and that, if I do, this will not adversely affect my future treatment. I am aware and agree that my doctors will send medial information relevant to the study to the central study organisers for analysis, where it will be treated as strictly confidential and nothing identifying me personally will be made publicly available.

☐ I understand that questionnaires will be posted to my home address for up to ten years and that the study researchers may contact me by telephone or email to remind me to complete the questionnaires or to ask me the questions on the telephone.

☐ I understand that participants will not be informed of their allocation until clear evidence for or against LUNA emerges.

☐ I consent to my GP being informed that I am participating in the LUNA study and for the study researchers to obtain follow-up information through my GP if necessary.

Signature of patient ..... Date .....

Signature of investigator ..... Date .....

Appendix 7.3: Registration and randomisation form

PATIENT IDENTIFIERS

Hospital:……	Randomising Clinician: ……..….
Patient Surname:……	Forenames: ……..
Address: ……	
Postcode: ……...	Email: ……..……
Telephone Number: Home ……	Date of Birth: ……...……..……
Work: ……...	NHS No: ……..
Mobile: ……	Hosp. No: ……..
Patient GP: ……	GP Address: ……..……
……	

GENERAL INFORMATION

Para:…… Gravida:…….

Marital status: Single ☐ Married ☐ Divorced ☐ Living with partner ☐

Is the patient currently sexually active ? No ☐ Yes ☐

Current medication : Pain killers No ☐ Yes ☐ Specify ……..……

Antidepressants/ antipsychotics No ☐ Yes ☐ Specify ……...……

Other specified drug: …… Indication ……..

…… ……..

Type of pain	Present	If present, location of pain			Duration of pain	
		Right	Central	Left	(Months)	
Dysmenorrhoea						Not eligible if
Dyspareunia						

Other						

ELIGIBILITY CHECKLIST: Complete at clinic

	Yes	No
Pelvic pain of more than six months duration	☐	☐
Negative effect on life quality	☐	☐
Definite indication for diagnostic laparoscopy	☐	☐
Non-response to medical treatment	☐	☐
Prior surgery for endometriosis	☐	☐
Prior surgery for PID.	☐	☐
Prior hysterectomy	☐	☐
Adnexal pathology.	☐	☐
The patient has given written informed consent.	☐	

When this page is complete, either
FAX to BCTU on **0121 687 2313**
Or enter **online** at
https://www.trials.bham.ac.uk/luna
BEFORE LAPAROSCOPY

AT- LAPAROSCOPY ELIGIBILITY CHECKLIST: Complete in theatre

Surgeon ..... **Date of operation: ____/____/____** **Contact No** .....

Adhesions Present?	☐ No
	☐ Yes, requiring adhesionolysis only
	☐ Yes, requiring significant additional treatment
Endometriosis Present?	☐ No
	☐ Minimal
American fertility score must be ≤ 5	☐ Minimal, ablated
	☐ Moderate
	☐ Severe
Pelvic Inflammatory Disease	☐ No
	☐ Minimal
	☐ Yes, significant pathology
Other pathology present?	☐ No
	☐ Yes, minimal, specify…….…….
	☐ Yes, significant and patient unsuitable for the trial
Technical Feasibility	☐ Yes
Is it possible to perform BILATERAL LUNA if randomised to LUNA?	☐ No, specifiy ……..

All questions must be answered before randomised allocation can be given.

If no shaded boxes are ticked, patient will be randomised.

For Randomisation Telephone
0800 953 0274

If any shaded boxes are ticked, patient will not be randomised but can be registered for follow-up only.

Treatment Allocation	☐ LUNA
	☐ No LUNA
Ineligible Registered Case	☐ Follow-up
TRIAL NUMBER ☐	Date of randomisation……/……./…….. or registration

Signed…….

NOW RETURN this form to the BCTU with the Consent Form, Post-Surgery Form and Enrolment Questionnaire.

Appendix 7.4: Post surgery form

LUNA Trial Number ☐

Patient initials ..... Date of birth ..../..../....

OPERATIVE INFORMATION

Number of laparoscopic ports (including the subumbilical /intraumbilical port)**:** .....

Size of subumbilical/ intraumbilical port: ..... mm

Location of pelvic port(s): RIF ☐ Suprapubic ☐ LIF ☐

Location of Sham incision: RIF ☐ Suprapubic ☐ LIF ☐

Local anaesthetic infiltration at port sites? No ☐ Yes ☐ (specify) .....

Was LUNA performed? No ☐ Yes ☐

Bipolar diathermy to uterosacral ligaments prior to cutting? No ☐ Yes ☐

Cutting modality: Laser ☐ Diathermy ☐ Scissors ☐

If laser was used: Power setting: ..... watts

Type of laser: Nd:YAG ☐ CO_2 ☐

If diathermy used: Power setting: ..... watts

Type of current used: Pure cut ☐ Blended ☐

Configuration of diathermy instrument:

Spoon ☐ Scissors ☐ Needle ☐ Hook ☐ Other ☐

In your judgement, how much were the uterosacral ligaments transected or ablated?

Completely ☐ Partially ☐ Not transected ☐

How lateral from their cervical attachment were the uterosacral ligaments transected or ablated? .....

(Specify in cm)

Type of irrigation fluid used: Hartmann's ☐ Saline ☐ _____ Other

Were there any surgical complications? (Specify)

☐ ☐ ☐

Haemorrhage Laparotomy Ureteric damage Other (specify) .....

Any additional surgery carried out which could affect pelvic pain…….

Signed: ..... Date: .....

Appendix 7.5: Enrolment Questionnaire

Assessment of pelvic pain

A measure of pain is essential to determine if the operation has worked well for you. Please place a mark **(x)** on the lines shown below to indicate how much pelvic pain you had in the last month. One extreme of the line represents "no pain at all" while the other represents "as much pain as you can possibly imagine".

Pain during your periods

0 **10** ***Not Applicable*** ☐

No pain at all — Worst imaginable pain

Pain during intercourse

0 **10** ***Not Applicable*** ☐

No pain at all — Worst imaginable pain

Pain at any other times (other than during period or during intercourse)

0 **10**

No pain at all — Worst imaginable pain

Compared to one month ago, would you say your pain has:

Got much better ☐ Got a little better ☐

Not changed much ☐ Got worse ☐

Treatment for pelvic pain

Please answer **all** questions by ticking the appropriate box and providing additional information if necessary.

Please consider the last three months when answering these questions.

Are you currently taking any other treatment for your pain? No ☐ Yes ☐

If **yes**, please give name of treatment .....

For the next questions, if the answer is **yes,** please give number of days / visits as appropriate.

Please consider the last three months when answering these questions.

☐ ☐

Have you spent any days in hospital ? No Yes No. Days .....
Why?

Have you had to visit the hospital outpatient clinic due to the pain? No ☐ Yes ☐ .....
No. Visits

Have you seen your GP at their surgery because of the pain? No ☐ Yes ☐ No. .....
Visits

Has your GP or nurse had to visit to you at home due to the pain? No ☐ Yes ☐ .....
No. Visits

Have you taken days off work because of the pain? No ☐ Yes ☐ No. Days .....

Assessment of sexual activity

Although the following questions are sensitive and personal, they are important in determining how different tests and treatments affect this part of your life. Please be assured that your responses to these questions will remain confidential.

	Yes	**No**
1. Are you currently married or having an intimate relationship with someone?	☐	☐
2. Have you changed your sexual partner in the last 6 months?	☐	☐
3. Do you engage in sexual activity with anyone at the moment?	☐	☐

If you answered yes to question 3, go to the next page.

I answered 'No' to question 3. I am not sexually active at the moment because:

(Please tick as many of these items as apply)

a) I do not have a partner at the moment ☐

b) I am too tired ☐

c) My partner is too tired

d) I am not interested in sex ☐

e) My partner is not interested in sex ☐

f) I have a physical problem which makes sexual relations difficult or uncomfortable ☐

g) My partner has a physical problem which makes sexual relations difficult or uncomfortable ☐

h) Other reasons (please describe) ☐

……..

……☐

Please complete this section if you are sexually active (i.e. you answered 'Yes' to question 3).
Please read each of the following questions carefully and tick the box that best indicates your sexual feelings and experiences during the past month.

During the past month:

		Very much	Somewhat	A little	Not at all
1	Was 'having sex' an important part of your life this month?				
2	Did you enjoy sexual activity this month?				
3	In general, were you too tired to have sex?				
4	Did you desire to have sex with your partner(s) this month?				
5	During sexual relations, how frequently did you notice dryness of your vagina this month?				
6	Did you feel pain or discomfort during penetration this month?				
7	In general, did you feel satisfied after sexual activity this month?				
		5 times or more	3-4 times	1-2 times	Not at all
8	How often did you engage in sexual activity this month?				
		Much more	Somewhat more	About the same	Not at all
9	How did this frequency of sexual activity compare with what is usual for you?				
		Very much	Somewhat	A little	Not at all
10	Were you satisfied with the frequency of sexual activity this month?				

Any comments

.....

.....

Quality of Life questions
Please answer the questions by ticking one box in each group. Please indicate which statement best describes your own health <u>today</u>.

Date completed:
……/……../……

1. Mobility
   - I have no problems walking about ☐
   - I have some problems in walking about ☐
   - I am confined to bed ☐

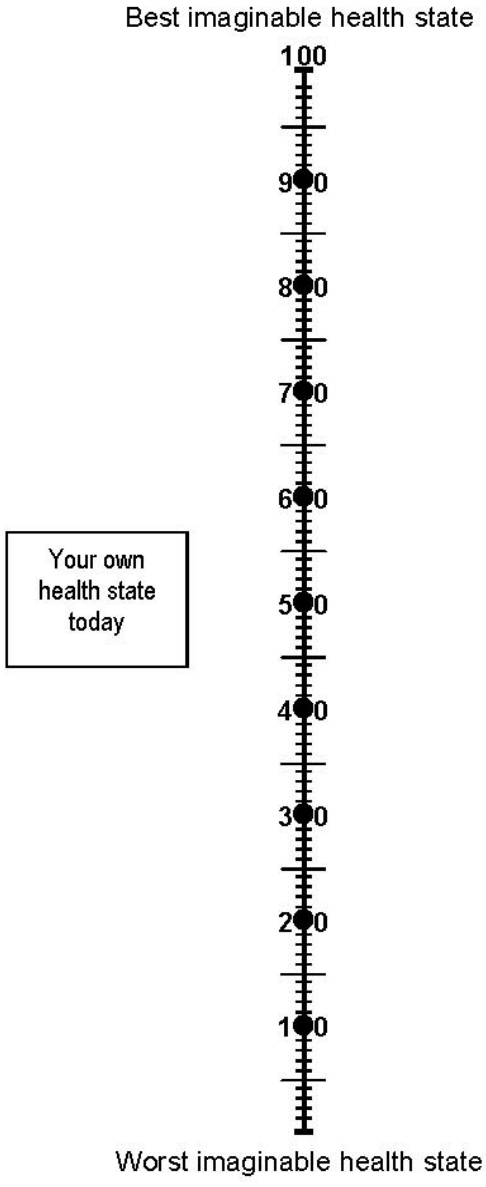
2. Self care
   - I have no problems with self-care ☐
   - I have some problems washing or dressing myself ☐
   - I am unable to wash or dress myself ☐

3. Usual activities e.g. work, study, housework, family or leisure activities
   - I have no problems with performing my usual activities ☐
   - I have some problems with performing my usual activities ☐
   - I am unable to perform my usual activities ☐

4. Pain/ Discomfort
   - I have no pain or discomfort ☐
   - I have moderate pain or discomfort ☐
   - I have extreme pain or discomfort ☐

5. Anxiety/ Depression
   - I am not anxious or depressed ☐
   - I am moderately anxious or depressed ☐
   - I am extremely anxious or depressed ☐

To help people say how good or bad their health state is, we have drawn a scale (rather like a thermometer) on which the best state you can imagine is marked by 100 and the worst state you could imagine is marked by 0.
We would like you to indicate on the scale how good or bad your own health is today, in your opinion. Please do this by drawing a line from the box to whichever point on the scale indicates how good or bad your current health state is.



Appendix 7.6: Follow up questionnaire

Assessment of pelvic pain

A measure of pain is essential to determine if the operation has worked well for you. Please place a mark **(x)** on the lines shown below to indicate how much pain you had in the last month. One extreme of the line represents "no pain at all" while the other represents "as much pain as you can possibly imagine".

Pain during your periods

0 **10** ☐

Not Applicable

No pain at all — Worst imaginable pain

Pain during intercourse

0 **10** ☐

Not Applicable

No pain at all — Worst imaginable pain

Pain at any other times (other than during period or during intercourse)

0 **10**

No pain at all — Worst imaginable pain

Compared to one month ago, would you say your pain has:

Got much better ☐ Got a little better ☐
Not changed much ☐ Got worse ☐

Treatment for pelvic pain

Please answer **all** questions by ticking the appropriate box and providing additional information if necessary.
Please consider the last 3 months when answering these questions.

Are you currently taking any other treatment for your pain? No ☐ Yes ☐
If **yes**, please give name of treatment .....

For the next questions, if the answer is **yes,** please give number of days/ visits as appropriate.

Have you spent any days in hospital? No ☐ Yes ☐ No. Days ..... Why? .....

Have you had to visit the hospital outpatient clinic due to the pain? No ☐ Yes ☐ .....
No. Visits

Have you seen your GP at their surgery because of the pain? No ☐ Yes ☐ No. .....
Visits

Has your GP or nurse had to visit to you at home due to the pain? No ☐ Yes ☐ .....
No. Visits

Have you taken days off work because of the pain? No ☐ Yes ☐ No. .....
Days

Other gynaecological (womens' health) treatments

Since the last questionnaire (at <x> years after your laparoscopy)

Have you had any other gynaecological surgery?

No ☐ Yes ☐ if yes, was it another laparoscopy? ☐ Hysterectomy? ☐

S urgery for endometriosis? ☐ D&C? ☐ IVF? ☐

Other ☐ What was this for? .....

Have you seen a gynaecologist for any other reason?

No ☐ Yes ☐ why? .....

Have you become pregnant?

No ☐ Yes ☐ Date (approximately) you became pregnant ..../..../....

Assessment of sexual activity

Although the following questions are sensitive and personal, they are important in determining how different tests and treatments affect this part of your life. Please be assured that your responses to these questions will remain confidential.

	Yes	**No**
1. Are you currently married or having an Intimate relationship with someone?	☐	☐
2. Have you changed your sexual partner in the last 6 months?	☐	☐
3. Do you engage in sexual activity with anyone at the moment?	☐	☐

If you answered yes to question 3, go to the next page.

I answered 'No' to question 3. I am not sexually active at the moment because:

(Please tick as many of these items as apply)

a) I do not have a partner at the moment ☐
b) I am too tired ☐
c) My partner is too tired ☐
d) I am not interested in sex ☐
e) My partner is not interested in sex ☐
f) I have a physical problem which makes sexual relations difficult or uncomfortable ☐
g) My partner has a physical problem which makes sexual relations difficult or uncomfortable ☐
h) Other reasons (please describe) ☐
……

…….

Please complete this section if you are sexually active (i.e. you answered 'Yes' to question 3).
Please read each of the following questions carefully and tick the box that best indicates your sexual feelings and experiences <u>during the past month.</u>

<u>During the past month</u>:

		Very much	Somewhat	A little	Not at all
1	Was 'having sex' an important part of your life this month?				
2	Did you enjoy sexual activity this month?				
3	In general, were you too tired to have sex?				
4	Did you desire to have sex with your partner(s) this month?				
5	During sexual relations, how frequently did you notice dryness of your vagina this month?				
6	Did you feel pain or discomfort during penetration this month?				
7	In general, did you feel satisfied after sexual activity this month?				

		5 times or more	3-4 times	1-2 times	Not at all
8	How often did you engage in sexual activity this month?				

		Much more	Somewhat more	About the same	Not at all
9	How did this frequency of sexual activity compare with what is usual for you?				

		Very much	Somewhat	A little	Not at all
10	Were you satisfied with the frequency of sexual activity this month?				

Any comments

Quality of Life questions

Please answer the questions by ticking one box in each group. Please indicate which statement best describes your own health <u>today</u>.

Date completed:
……./……./……

6. Mobility
   - I have no problems walking about ☐
   - I have some problems in walking about ☐
   - I am confined to bed ☐

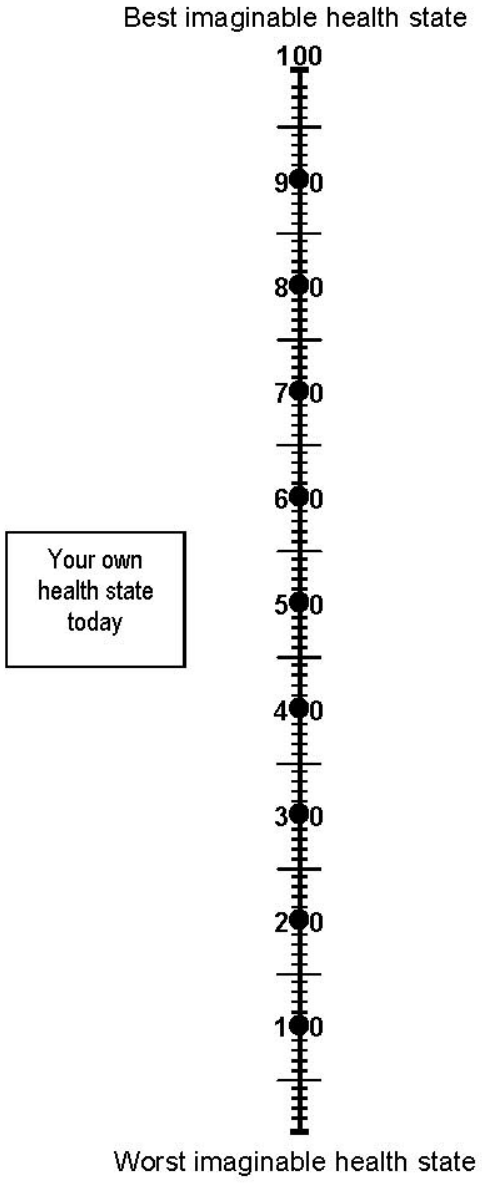
7. Self care
   - I have no problems with self-care ☐
   - I have some problems washing or dressing myself ☐
   - I am unable to wash or dress myself ☐

8. Usual activities e.g. work, study, housework, family or leisure activities
   - I have no problems with performing my usual activities ☐
   - I have some problems with performing my usual activities ☐
   - I am unable to perform my usual activities ☐

9. Pain/ Discomfort
   - I have no pain or discomfort ☐
   - I have moderate pain or discomfort ☐
   - I have extreme pain or discomfort ☐

10. Anxiety/ Depression
    - I am not anxious or depressed ☐
    - I am moderately anxious or depressed ☐
    - I am extremely anxious or depressed ☐

To help people say how good or bad their health state is, we have drawn a scale (rather like a thermometer) on which the best state you can imagine is marked by 100 and the worst state you could imagine is marked by 0.
We would like you to indicate on the scale how good or bad your own health is today, in your opinion. Please do this by drawing a line from the box to whichever point on the scale indicates how good or bad your current health state is.



Appendix 7.7: Investigator agreement

LUNA

A RANDOMISED CONTROLLED TRIAL TO ASSESS THE EFFICACY OF LAPAROSCOPIC UTEROSACRAL NERVE ABLATION (LUNA) IN THE TREATMENT OF CHRONIC PELVIC PAIN

Investigator agreement

I have had the opportunity to read the LUNA trial protocol and I consider it scientifically and ethically justifiable to enrol patients in this study. I have sufficient surgical experience and skill to take part as I have successfully undertaken at least 20 LUNA procedures on previous patients. I agree to conduct the study in accordance with the terms of the study protocol and the MRC Guidelines for Good Clinical Practice in Clinical Trials (1998).

I understand and accept that this study will be published under the authorship of the LUNA trial group with all investigators of the group listed as co-authors, I agree that there will be no separate publications on individual populations from single trial centres without the consent of the trial management group.

Signed ..... Date .....

Clinical Investigator

Print Name .....

Position .....

Please return this form to:

LUNA Trial Office
University of Birmingham Clinical Trials Unit
Park Grange
1 Somerset Road
Edgbaston
Birmingham
B15 2RR

Appendix 7.8: Specimen letter to General Practitioner

Doctor's name
Practice
Street
City
Postcode

NAME
DATE OF BIRTH
HOSPITAL NUMBER
DATE RANDOMISED
TRIAL NUMBER

Dear Dr *gp*,
You will be aware that your patient named above has had chronic pelvic pain and has been seen by Dr *consultant* at *hospital*. With her written consent, she is participating in LUNA, a clinical trial assessing the efficacy of laparoscopic uterosacral nerve ablation (LUNA) for her condition.
The patient will have a diagnostic laparoscopy on *date*. If she fulfils all the eligibility criteria, treatment allocation will be randomised either to nerve ablation or no nerve ablation. The study is "blinded" so the treatment allocated at randomisation cannot be disclosed until conclusive evidence to support or refute the efficacy of LUNA is available. The patient will be sent postal questionnaires, asking about pain, quality of life, sexual activity and demands on health care resources, at 3 and 6 months, and 1, 2, 3, 5 and 10 years post-operatively. We may also contact you to verify any gynaecological consultations and referrals she reports to us.
The patient should not need any additional surgical treatment for her pelvic pain, but the trial does not preclude the GP from giving whatever other treatment they consider necessary. The investigators do not anticipate that there will be any complications that would necessitate the unblinding of the treatment, but in exceptional circumstances the consultant has a record of the treatment, which is kept separate from her notes.
The local co-ordinator for the trial is Dr *patient*, Department of Obstetrics and Gynaecology, *hospital*. The trial has been reviewed by the West Midlands Multicentre Research Ethics Committee and is also approved by the Local Research Ethics Committee. The University of Birmingham Clinical Trials Unit undertakes the randomisation and trial management. The study organisation is funded by the Wellbeing charity.
Please file this letter in the patient's notes. I would appreciate being notified if there are any errors or if she is no longer one of your patients.
Yours sincerely,

Jane Daniels. *Gynaecologist*
Trial Co-ordinator Local Investigator