Antenatal perineal massage for reducing perineal trauma (Review)

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TABLE OF CONTENTS

[Intervention Review]

Antenatal perineal massage for reducing perineal trauma

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ABSTRACT

Background

Perineal trauma following vaginal birth can be associated with significant short-term and long-term morbidity. Antenatal perineal massage has been proposed as one method of decreasing the incidence of perineal trauma.

Objectives

To assess the effect of antenatal perineal massage on the incidence of perineal trauma at birth and subsequent morbidity.

Search methods

We searched the Cochrane Pregnancy and Childbirth Group's Trials Register (June 2008), the Cochrane Central Register of Controlled Trials (*The Cochrane Library* 2008, Issue 2), PubMed (1966 to June 2008), EMBASE (1980 to June 2008) and reference lists of relevant articles.

Selection criteria

Randomised and quasi-randomised controlled trials evaluating any described method of antenatal perineal massage undertaken for at least the last four weeks of pregnancy.

Data collection and analysis

Both review authors independently applied the selection criteria, extracted data from the included studies and assessed study quality. We contacted study authors for additional information.

Main results

We included four trials (2497 women) comparing digital perineal massage with control. All were of good quality. Antenatal perineal massage was associated with an overall reduction in the incidence of trauma requiring suturing (four trials, 2480 women, risk ratio (RR) 0.91 (95% confidence interval (CI) 0.86 to 0.96), number needed to treat (NNT) 15 (10 to 36)) and women practicing perineal massage were less likely to have an episiotomy (four trials, 2480 women, RR 0.84 (95% CI 0.74 to 0.95), NNT 21 (12 to 75)). These findings were significant for women without previous vaginal birth only. No differences were seen in the incidence of first- or second-degree perineal tears or third-/fourth-degree perineal trauma. Only women who have previously birthed vaginally reported a statistically significant reduction in the incidence of pain at three months postpartum (one trial, 376 women, RR 0.45 (95% CI 0.24 to 0.87) NNT 13 (7 to 60)). No significant differences were observed in the incidence of instrumental deliveries, sexual satisfaction, or incontinence of urine, faeces or flatus for any women who practised perineal massage compared with those who did not massage.

Authors' conclusions

Antenatal perineal massage reduces the likelihood of perineal trauma (mainly episiotomies) and the reporting of ongoing perineal pain, and is generally well accepted by women. As such, women should be made aware of the likely benefit of perineal massage and provided with information on how to massage.

PLAIN LANGUAGE SUMMARY

Antenatal perineal massage for reducing perineal trauma

Antenatal perineal massage helps reduce both perineal trauma during birth and pain afterwards.

Most women are keen to give birth without perineal tears, cuts and stitches, as these often cause pain and discomfort afterwards, and this can impact negatively on sexual functioning. Perineal massage during the last month of pregnancy has been suggested as a possible way of enabling the perineal tissue to expand more easily during birth. The review of four trials (2497 women) showed that perineal massage, undertaken by the woman or her partner (for as little as once or twice a week from 35 weeks), reduced the likelihood of perineal trauma (mainly episiotomies) and ongoing perineal pain. The impact was clear for women who had not given birth vaginally before, but was less clear for women who had. There were no randomised trials on the use of massage devices. Women should be informed about the benefits of antenatal perineal massage.

BACKGROUND

Genital tract trauma

Trauma to the genital tract commonly accompanies vaginal birth. Perineal trauma is classified as first degree (involving the fourchette, perineal skin and vaginal mucous membrane), second degree (involving the fascia and muscle of the perineal body), third degree (involving the anal sphincter) and fourth degree (involving the rectal mucosa) (Williams 1997). Genital tract trauma can result from episiotomies (incision to enlarge vaginal opening), spontaneous tears or both. Although in some countries the frequency of episiotomy has declined in recent years, overall rates of trauma remain high. There is considerable variation in the reported rates of perineal trauma because of inconsistency in definitions and reporting practices. In studies of restrictive use of episiotomy, 51% to 77% of women still sustained trauma which was considered to be sufficiently extensive to require suturing (Albers 1999; Mayerhofer 2002; McCandlish 1998). Even in a home birth setting, approximately 30% of women experience some degree of perineal trauma (Murphy 1998). Rates of trauma are especially high in women having their first baby (Albers 1999).

Morbidity associated with perineal trauma

Perineal trauma can be associated with significant short-term and long-term morbidity. Most women experience perineal pain or discomfort in the first few days after a vaginal birth. Of those women who sustain perineal trauma, 40% report pain in the first two weeks postpartum, up to 20% still have pain at eight weeks (Glazener 1995), and 7% to 9% report pain at three months (McCandlish 1998; Sleep 1987). Women giving birth with an intact perineum, however, report pain less frequently at 1, 2, 10 and 90 days postpartum (Albers 1999; Klein 1994).

Perineal pain or discomfort is common and may impair normal sexual functioning. Dyspareunia (painful sex) following vaginal delivery is reported by 60% of women at three months, 30% at six months (Barrett 2000) and 15% still experience painful sex up to three years later (Sleep 1987). Trauma to the perineum has been associated with dyspareunia during the first three months after birth (Barrett 2000). Women with an intact perineum (compared with those who have experienced perineal trauma) are more likely to resume intercourse earlier, report less pain with first sexual intercourse, report greater satisfaction with sexual experience (Klein 1994), and report greater sexual sensation and likelihood of orgasm at six months postpartum (Signorello 2001).

Women giving birth to their first baby with an intact perineum have stronger pelvic floors (measured by electromyogram) and make quicker muscle recovery than those women suffering spontaneous tears or episiotomies (Klein 1994). Perineal trauma has not, however, been clearly associated with urinary incontinence

(Woolley 1995). Anal sphincter or mucosal injuries are identified following 3% to 4% of all vaginal births. This rate is not reduced by a policy of restrictive use of episiotomy (Carroli 1999). Alarmingly, one-third of those that are recognised will suffer some degree of incontinence of faeces (from mild to severe) following primary repair (Sultan 2002). An estimated 35% of primiparas have ultrasound scan evidence of third- or fourth-degree trauma that is unrecognised at delivery and presumably associated with vaginal birth (Sultan 1993).

There is no evidence that birthing practices that aim to reduce perineal trauma are correlated with adverse maternal or neonatal outcomes. Restrictive use of episiotomy results in less posterior perineal trauma, less suturing and fewer healing complications (Carroli 1999). Episiotomy does not reduce the risk of intraventricular haemorrhage in low-birthweight babies (Woolley 1995), and allowing a longer second stage (and potentially avoiding perineal trauma), has not been shown to be associated with adverse perinatal outcomes (Menticoglou 1995).

Factors associated with perineal trauma

Numerous factors related to the woman or the care she receives have been suggested as potentially affecting the occurrence of genital tract trauma. Perineal trauma is more likely in nulliparas, and is more likely with increasing fetal head diameter and weight, and with malposition (Mayerhofer 2002; Nodine 1987). As mentioned, restrictive use of episiotomy is associated with less perineal trauma (Carroli 1999), as is the use of vacuum extraction for instrumental deliveries as opposed to forceps (Johanson 1999). There is no clear consensus about the role of perineal guarding (Mayerhofer 2002; McCandlish 1998), active directed pushing (Parnell 1993), maternal position (Gupta 2003) or the use of perineal massage during second stage (Stamp 2001) in reducing the incidence of perineal trauma. There is a lack of evidence to associate induction of labour with perineal trauma and only retrospective studies which suggest an association between accoucheur type and perineal trauma (Bodner-Adler 2004; Shorten 2002). In the event of a perineal injury which requires suturing, a continuous subcuticular technique compared with interrupted sutures has been associated with less pain postpartum (Kettle 1998).

Preventing perineal trauma

The potential morbidity associated with vaginal birth is concerning. It is possible that this is contributing to the increase in requests for caesarean section (Al-Mufti 1997). Considering these factors, any method proven to reduce the likelihood of sustaining genital tract trauma (and therefore delivery-associated morbidity) is to be commended. Preventing even some of this childbirth trauma is likely to benefit large numbers of women. It may also result in cost savings in terms of less suturing, drugs and analgesics. Some have advocated the use of perineal massage antenatally in decreasing the incidence of perineal trauma during vaginal birth. It is proposed that perineal massage may increase the flexibility of the perineal muscles and therefore decrease muscular resistance which would enable the perineum to stretch at delivery without tearing or needing episiotomy. Our aim is to investigate the role of antenatal perineal massage and its effect upon the incidence and morbidity associated with perineal trauma.

OBJECTIVES

To assess the effect of antenatal perineal massage on the incidence of perineal trauma at birth and subsequent morbidity.

METHODS

Criteria for considering studies for this review

Types of studies

All published and unpublished randomised and quasi-randomised controlled trials evaluating any described method of antenatal perineal massage were considered for inclusion in the review.

Types of participants

All pregnant women who are planning vaginal birth and have undertaken perineal massage for at least the last four weeks of pregnancy.

Types of interventions

Any described method of perineal massage undertaken by women, partner or using a device.

Types of outcome measures

(a) Perineal trauma requiring suturing;
(b) first-degree perineal tear;
(c) second-degree perineal tear;
(d) third- or fourth-degree perineal trauma;
(e) incidence of episiotomy;
(f) length of second stage;
(g) instrumental delivery;
(h) length of inpatient stay;
(i) admission to nursery;
(j) Apgar less than four at one minute and/or less than seven at five minutes;

(k) woman's satisfaction;
(l) perineal pain postpartum;
(m) ongoing perineal pain postpartum;
(n) painful sex postpartum;
(o) sexual satisfaction postpartum;
(p) uncontrolled loss of urine postpartum;
(q) uncontrolled loss of flatus or faeces postpartum.

Search methods for identification of studies

Electronic searches

We searched the Cochrane Pregnancy and Childbirth Group's Trials Register by contacting the Trials Search Co-ordinator (June 2008).

The Cochrane Pregnancy and Childbirth Group's Trials Register is maintained by the Trials Search Co-ordinator and contains trials identified from:

1. quarterly searches of the Cochrane Central Register of Controlled Trials (CENTRAL);
2. weekly searches of MEDLINE;
3. handsearches of 30 journals and the proceedings of major conferences;
4. weekly current awareness alerts for a further 44 journals plus monthly BioMed Central email alerts.

Details of the search strategies for CENTRAL and MEDLINE, the list of handsearched journals and conference proceedings, and the list of journals reviewed via the current awareness service can be found in the 'Specialized Register' section within the editorial information about the Cochrane Pregnancy and Childbirth Group.

Trials identified through the searching activities described above are each assigned to a review topic (or topics). The Trials Search Co-ordinator searches the register for each review using the topic list rather than keywords.

In addition, we searched CENTRAL (*The Cochrane Library* 2008, Issue 2), PubMed (1966 to June 2008),and EMBASE (1980 to June 2008) using the search strategy in Appendix 1.

Searching other resources

We contacted researchers to provide further information. We contacted experts in the field for additional and ongoing trials. We searched the reference lists of trials and review articles.

We did not apply any language restrictions.

Data collection and analysis

We considered for inclusion all studies identified by the search strategy outlined above. Both review authors independently evaluated trials under consideration for appropriateness for inclusion and methodological quality without consideration of their results. Any differences of opinion were resolved by open discussion. We recorded and reported in the review the reasons for excluding trials. Both review authors independently entered the extracted data into Review Manager (RevMan 2008). We performed statistical analyses using Review Manager.

We assessed included trial data as described in the Cochrane Handbook for Systematic Reviews of Interventions (Higgins 2008). We described methods used for generation of the randomisation sequence for each trial.

(1) Selection bias (allocation concealment)

We assigned a quality score for each trial, using the following criteria:

(A) adequate concealment of allocation, such as: telephone randomisation, consecutively numbered sealed opaque envelopes;

(B) unclear whether adequate concealment of allocation, such as: list or table used, sealed envelopes, or study does not report any concealment approach;

(C) inadequate concealment of allocation, such as: open list of random-number tables, use of case record numbers, dates of birth or days of the week.

(2) Attrition bias (loss of participants, e.g. withdrawals, dropouts, protocol deviations)

We assessed completeness to follow up using the following criteria:

(A) less than 5% loss of participants;

(B) 5% to 9.9% loss of participants;

(C) 10% to 19.9% loss of participants;

(D) more than 20% loss of participants.

(3) Performance bias (blinding of participants, researchers and outcome assessment)

We assessed blinding using the following criteria:

(A) blinding of participants (yes/no/unclear);

(B) blinding of caregiver (yes/no/unclear);

(C) blinding of outcome assessment (yes/no/unclear).

For dichotomous data we calculated the relative risks and 95% confidence intervals (CI) and pooled the results using a fixed-effect model. For continuous data we used mean differences and 95% CI. We evaluated statistical heterogeneity by a visual inspection of forest plots and using the I^2 statistic as calculated in 'RevMan Analyses'. We detected no significant heterogeneity (I^2 statistic greater than 50%) in any of the outcome measures.

We attempted to undertake the following subgroup analyses:

(a) women with previous vaginal birth versus without previous vaginal birth;

(b) digital perineal massage versus massaging device;

(c) daily perineal massage versus less frequent perineal massage.

RESULTS

Description of studies

See: Characteristics of included studies; Characteristics of excluded studies.
See table of 'Characteristics of included studies'.
Four trials (Labrecque 1994; Labrecque 1999; Shimada 2005; Shipman 1997) involving 2497 women were included in the review. Labrecque 1994 was a pilot paper involving just 46 women. Labrecque 1994, Shimada 2005 and Shipman 1997 studied only women without previous vaginal birth. Labrecque 1999 involved women with and without a previous vaginal birth and the randomisation of participants was stratified by parity. The trial participants were also followed up with a questionnaire which was subsequently reported in 2001 (Labrecque 2001).
All trials were of digital perineal massage performed by the woman or her partner. There were no trials of massage using a massaging device suitable for inclusion in the review.

Risk of bias in included studies

Details for each trial are in the table of 'Characteristics of included studies'.
All included trials were of good quality. Given the nature of the intervention, it was not possible for any of the studies to blind participants to the intervention. The trials all recommended a similar technique of digital perineal massage which was undertaken from a similar gestation. The authors all instructed participants not to inform their birth attendant of their allocation and some attempt was made by authors of three of the four included studies to ensure adequate blinding of outcome assessment was upheld.
The three month follow-up questionnaire was returned by 79% of trial participants (with similar response rates from women in the massage and control groups).

Effects of interventions

We have included four trials involving a total of 2497 women in the review. All four trials (Labrecque 1994; Labrecque 1999; Shimada 2005; Shipman 1997) report findings for a total of 2004 women without previous vaginal birth. Labrecque 1999 is the single trial reporting findings for 493 women with previous vaginal birth.

Digital perineal massage versus control

(A) Perineal trauma requiring suturing

Perineal massage was associated with an overall 9% reduction in the incidence of trauma requiring suturing (four trials, 2480 women, RR 0.91 (95% CI 0.86 to 0.96), NNT 15 (10 to 36)). This reduction was statistically significant for women without previous vaginal birth only (four trials, 1988 women, RR 0.90 (95% CI 0.84 to 0.96), NNT 14 (9 to 32)). Subgroup analysis revealed that women who massaged up to an average of 1.5 times per week experienced a 17% reduction (two trials, 1500 women, RR 0.83 (95% CI 0.75 to 0.92), NNT 9 (6 to 18)), women who massaged an average of 1.5 to 3.4 times per week experienced a 8% reduction (two trials, 1650 women, RR 0.92 (95% CI 0.85 to 1.00), NNT 22 (10 to 208)), while women who massage more than 3.5 times per week did not experience a statistically significant reduction in the incidence of trauma requiring suturing (two trials, 1598 women, RR 0.93 (95% CI 0.86 to 1.02)).

(B) First-degree perineal tear

There was no difference in the incidence of first-degree perineal tear overall (four trials, 2480 women, RR 0.96 (95% CI 0.79 to 1.16)) or in any subgroup.

(C) Second-degree perineal tear

There was no difference in the incidence of second-degree perineal tear overall (four trials, 2480 women, RR 0.99 (95% CI 0.85 to 1.15)) or in any subgroup.

(D) Third- or fourth-degree perineal trauma

There was no difference in the incidence of third- or fourth-degree perineal trauma overall (four trials, 2480 women, RR 0.81 (95% CI 0.56 to 1.18)) or in any subgroup.

(E) Incidence of episiotomy

Women who practised perineal massage were 16% less likely to have an episiotomy (four trials, 2480 women, RR 0.84 (95% CI 0.74 to 0.95), NNT 21 (12 to 75)). Again this reduction was statistically significant for women without previous vaginal birth only (four trials, 1988 women, RR 0.83 (95% CI 0.73 to 0.95), NNT 18 (11 to 70)). Only the subgroup of women who massaged up to an average of 1.5 times per week experienced a statistically significant reduction in the incidence of episiotomy (two trials, 1500 women, RR 0.72 (95% CI 0.57 to 0.91), NNT 12 (7 to 31)). No such effect was seen in women who massaged more frequently.

(F) Length of second stage

No difference in length of second stage was seen overall (three trials, 2211 women, mean difference (MD) 3.84 minutes (95% CI -0.26 to 7.95)) or comparing women with and without previous vaginal births. The women who massaged on average more than 3.5 times per week (but not the subgroups of women who massaged less

frequently) had a statistically significant longer second stage (two trials, 1509 women MD 10.80 minutes (95% CI 4.03 to 17.58)).

(G) Instrumental delivery

There was no difference in the proportion of instrumental deliveries performed overall (three trials, 2417 women, RR 0.94 (95% CI 0.81 to 1.08)) or in any subgroup.

(H) Length of inpatient stay

Length of inpatient stay was not recorded in any of the included studies.

(I) Admission to nursery

Admission to nursery was not recorded in any of the included studies.

(J) Apgar less than four at one minute and/or less than seven at five minutes

Apgar scores were not recorded in any of the included studies.

(K) Woman's satisfaction with perineal massage

Woman's satisfaction was not recorded in any of the included studies; however, a subsequent paper (Labrecque 2001) did report women's views on the practice of perineal massage (*see* Discussion).

(L) Perineal pain postpartum

Perineal pain in the days following birth was not recorded in any of the included studies.

(M) Ongoing perineal pain postpartum

One trial involving 931 women reported perineal pain at three months postpartum. There was an overall 32% reduction in perineal pain reported by women randomised to perineal massage (RR 0.68 (95% CI 0.50 to 0.91), NNT 16 (9 to 70)). Women who had previously birthed vaginally (and not nulliparas) were statistically significantly less likely to report perineal pain at three months postpartum (one trial, 376 women, RR 0.45 (95% CI 0.24 to 0.87) NNT 13 (7 to 60)) as were the subgroup of women who most frequently massaged (one trial, 701 women, RR 0.51 (95% CI 0.33 to 0.79) NNT 11 (7 to 24)).

(N) Painful sex postpartum

No differences in the reporting of painful sex at three months postpartum were detected overall (one trial, 831 women, RR 0.96 (95% CI 0.84 to 1.08)) or in any subgroup.

(O) Sexual satisfaction postpartum

One trial involving 921 woman reported the woman's sexual satisfaction at three months postpartum. No difference was seen overall (RR 1.02 (95% CI 0.96 to 1.10)) or in any subgroup. In one trial 916 women responded to questions about their partner's sexual satisfaction at three months postpartum. Again no difference was seen overall (RR 0.97 (95% CI 0.91 to 1.04)) or in any subgroup.

(P) Uncontrolled loss of urine postpartum

No difference was seen in the proportion of women reporting incontinence of urine at three months postpartum overall (one trial, 949 women, RR 0.90 (95% CI 0.74 to 1.08)) or in any subgroup.

(Q) Uncontrolled loss of flatus or faeces postpartum

No difference was seen in the overall proportion of women reporting incontinence of flatus at three months postpartum (one trial, 948 women, RR 1.09 (95% CI 0.88 to 1.36)) or comparing women with and without a previous vaginal birth. Only the subgroup of women who massaged an average of less than 1.5 times per week reported flatal incontinence more frequently than controls (one trial, 587 women, RR 1.40 (95% CI 1.03 to 1.90) NNT 10 (5 to 1111)). Within this subgroup, there was no difference in the reporting of infrequent flatal incontinence (RR 0.87 (95% CI 0.57 to 1.32)); however, more women reported flatal incontinence occurring at least daily (RR 2.66 (95% CI 0.99 to 7.16)). This finding is based on very small numbers (6/108 versus 10/479) and hence the significance of this finding is unclear - *see* Table 1. No difference was seen in the proportion of women reporting incontinence of faeces at three months postpartum overall (one trial, 948 women, RR 0.72 (95% CI 0.35 to 1.49)) or in any subgroup.

Perineal massage using massaging device versus control

There were no trials of massage using massaging device that were suitable for inclusion in the review.

DISCUSSION

Women who practise perineal massage from approximately 35 weeks' gestation are less likely to have perineal trauma which requires suturing in association with vaginal birth. For every 15 women who practise perineal massage antenatally, one fewer will receive perineal suturing following the birth. There is no difference in the proportion of women who incur first- or second-degree perineal tears or third/fourth degree perineal trauma comparing those who massage with controls. There is, however, a statistically significant 16% reduction in the incidence of episiotomies in

women who practise perineal massage. Thus the reduction in perineal trauma requiring suturing following vaginal birth is almost entirely due to the fact that she is less likely to have an episiotomy. These reductions are significant for the subgroup of women who have never previously had a vaginal birth. There is no statistical difference in these outcomes for women who have previously birthed vaginally; however, only one included trial studied this group of women.

For the subgroup of women who have previously had a vaginal birth, antenatal perineal massage reduces the likelihood of perineal pain at three months in the sole study that assessed this outcome. The women who massage the most frequently are the least likely to report ongoing perineal pain postpartum. We proposed that this reduction in perineal pain at three months was because women who practise perineal massage are less likely to have an episiotomy and that having had an episiotomy is the most likely reason for ongoing pain. However, when we analysed the data excluding women who had episiotomies, this effect remained. In other words, for women who have had a previous vaginal birth, antenatal perineal massage appears to result in less reporting of perineal pain at three months even for those women who do not have an episiotomy. Women who massage the most frequently may not be able to further reduce their chance of an episiotomy but may lessen their likelihood of perineal pain at three months.

No significant differences are observed in the incidence of instrumental deliveries, sexual satisfaction, or incontinence of urine, faeces or flatus for any women who practise perineal massage compared with those who do not massage in the study that reported these outcomes.

Surprisingly the reduction in the incidence of episiotomy and of perineal trauma requiring suturing is not more pronounced in the women who massage the most frequently. It is also an unexpected finding that the subgroup of women who massage the most frequently have the longest second stage. If the reason that perineal massage works is that it increases the flexibility and decreases the resistance of the perineal muscles and soft tissues, then it would be anticipated that the most diligent massager should have the least chance of needing suturing and have a relatively short second stage. As this effect was not seen, there may be other reasons that women who practise perineal massage are less likely to incur perineal trauma (mainly episiotomies) that requires suturing. The decision regarding if and when an episiotomy is cut is a subjective one. We therefore considered the adequacy of blinding. We also considered the possibility that women who were instructed in perineal massage became very motivated to achieve a vaginal birth with an intact perineum and consequently, may have been more likely to want to keep pushing longer and oppose an episiotomy unless it was clearly necessary.

We proceeded to exclude women who had an episiotomy and reassess length of second stage (*see* Table 2). No significant differences were seen in the length of second stage after excluding women who had an episiotomy. If birth attendants were unblinded, we propose that after excluding episiotomies, the remaining women in the massage group would still have been encouraged to push longer while those in the control group would have had an overall shorter second stage (as the controls who avoided episiotomy likely delivered quickly). The net effect would therefore be an overall increase in the length of second stage when compared to controls. As this effect was not seen, we considered it less likely that unblinding occurred.

If the motivation of the informed woman for an intact perineum explains the reduction in trauma, then those who massaged the most frequently would likely have had the longest 2nd stage (as was seen). Further, women in the control group who were less informed and motivated about preventing perineal trauma, may have been less likely to push for as long and more receptive to an episiotomy if suggested. By excluding women who had episiotomies, the time spent pushing for women who practise perineal massage should be reduced (particularly for the subgroup of women who massaged the most frequently). When this analysis was performed we did see a reduction in the length of second stage in this subgroup. This weighs against the supposition that perineal massage reduces the incidence of episiotomy because of increased flexibility of the perineum. Nevertheless, it appears that women who are instructed in perineal massage (either because they become more informed about birthing, episiotomies and the advantages of an intact perineum, or because of the act of massaging itself) are less likely to have an episiotomy, require perineal suturing or report ongoing perineal pain postpartum.

Most women find the practice of perineal massage acceptable and believe it helps them prepare for birth (Labrecque 2001). (Details regarding the technique of perineal massage as described by Labrecque and Shipman are provided under Characteristics of included studies). Women comment that in the first few weeks massage can be uncomfortable, unpleasant and even produce a painful or burning sensation. Most women report that the pain and burning sensation has decreased or gone by the second or third week of massage. The majority (79%) report they would massage again and 87% would recommend it to another pregnant woman. Most women considered their partner's participation as positive. Several of the papers published on the use of perineal massaging devices (Cohain 2004; Hillebrenner 2001; Kok 2004) recorded and reported that the majority of women find this practice also acceptable.

Newer techniques of perineal massage using a massage device have been studied in case-controlled (Cohain 2004) and retrospective cohort studies (Hillebrenner 2001; Kok 2004; Kovacs 2004). However, no randomised trials comparing with control or digital perineal massage have been published.

AUTHORS' CONCLUSIONS

Implications for practice

Perineal trauma is associated with significant postpartum morbidity. Antenatal digital perineal massage from approximately 35 weeks' gestation reduces the incidence of perineal trauma requiring suturing (mainly episiotomies) and women are less likely to report perineal pain at three months postpartum (regardless of whether or not an episiotomy was performed). Although there is some transient discomfort in the first few weeks, it is generally well accepted by women. As such, women should be made aware of the likely benefit of perineal massage and provided with information on how to massage.

Implications for research

There are reasonable data supporting the reduction in perineal trauma requiring suturing in women who practise antenatal perineal massage. The reported outcomes of perineal pain, sexual satisfaction and incontinence are however based on one study and such findings need confirmation. More data are also needed regarding women who have previously had a vaginal birth before reaching conclusions about the effect of perineal massage on perineal trauma in this group. Randomised trials of perineal massaging devices appraising efficacy and cost-effectiveness are also needed.

ACKNOWLEDGEMENTS

None.

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* *Indicates the major publication for the study*

CHARACTERISTICS OF STUDIES

Characteristics of included studies *[ordered by study ID]*

Labrecque 1994

Methods	Randomisation using table of random numbers. Concealment of allocation by sealed, numbered, opaque envelopes. Participants asked not to tell physicians their assignment. Secrecy instruction upheld by 93.3%. All participants entered into trial included in analysis
Participants	46 women without previous vaginal birth between 32-34 weeks, singleton. Excluded if likely caesarean section or history of genital herpes in pregnancy
Interventions	Woman or partner performed daily 5-10 minute perineal massage from 34 weeks. 1-2 fingers introduced 3-4 cm in vagina, applying alternating downward and sideward pressure using sweet almond oil. Explained using foam perineal model in 15-20 minute session. Written instructions given and telephone follow-up 1 and 3 weeks after enrolment to encourage compliance. Given diary to record daily practice. Control group received no instruction on massage
Outcomes	Mode of delivery, incidence of episiotomy, incidence of perineal tear
Notes	Pilot study. Intervention group asked to complete questionnaire regarding acceptability of perineal massage

Risk of bias

Item	Authors' judgement	Description
Adequate sequence generation?	Yes	Randomisation using table of random numbers.
Allocation concealment?	Yes	A - Concealment of allocation by sealed, numbered, opaque envelopes
Blinding? All outcomes	Yes	Participants asked not to tell physicians their assignment. Secrecy instruction upheld by 93.3%
Incomplete outcome data addressed? All outcomes	Yes	A - All participants entered into trial included in analysis
Free of selective reporting?	Unclear	Small pilot study only
Free of other bias?	Yes	

Labrecque 1999

Methods	Multicentre trial. Randomisation (stratified by whether or not previous vaginal birth) using table of random numbers. Concealment of allocation by sealed, numbered, opaque envelopes. No breaches of sequential assignment. Participants asked not to tell physicians their assignment. Unblinding of study group in 5.6%. All participants entered into trial included in the analysis. Three months after delivery participants mailed a questionnaire. 79% response rate, similar between massage group and controls
Participants	1034 women without previous vaginal birth and 493 women with previous vaginal birth between 30-35 weeks, singleton. Excluded if high likelihood of delivery by caesarean section, history of genital herpes during pregnancy, inability to understand instructions or already practising perineal massage. 572 women without previous vaginal birth and 377 women with previous vaginal birth returned the subsequent questionnaire
Interventions	Woman or partner performed daily 10 minute perineal massage from 34 weeks. One or two fingers introduced 3 to 4 cm in vagina, applying alternating downward and sideward pressure using sweet almond oil. Explained using foam perineal model in 15 to 20 minute session. Written instructions were offered and telephone follow-up one and three weeks after enrolment to encourage compliance. Given diary to record daily practice. Control group received no instruction on massage
Outcomes	Mode of delivery, incidence of episiotomy, incidence of perineal tear, satisfaction with birth. Questionnaire at 3 months assessed self-reported pain, sexual function of woman and partner, urinary, faecal and flatal incontinence
Notes	Contact with author provided results by frequency of massage. Data from questionnaire at three months is also reported by Eason 2002

Risk of bias

Item	**Authors' judgement**	**Description**
Adequate sequence generation?	Yes	Randomisation (stratified by whether or not previous vaginal birth) using table of random numbers
Allocation concealment?	Yes	A - Concealment of allocation by sealed, numbered, opaque envelopes. No breaches of sequential assignment
Blinding? All outcomes	Yes	Participants asked not to tell physicians their assignment. Unblinding of study group in 5.6%
Incomplete outcome data addressed? All outcomes	Yes	A - All participants entered into trial included in the analysis
Free of selective reporting?	Yes	Contact with author provided results by frequency of massage

Labrecque 1999 (*Continued*)

Free of other bias?	Yes	

Shimada 2005

Methods	Randomisation achieved by drawing a sealed opaque envelope from a closed box. Participants were asked not to tell healthcare providers their assignment. No process documented to check blinding. All participants entered into trial included in the analysis
Participants	63 women without previous vaginal birth between 34 to 36 weeks. Excluded if high likelihood of birth by caesarean section
Interventions	Woman or partner performed five minutes of perineal massage following bath or shower using sweet almond oil. No specific description of technique. Massage performed four times per week. Given diary to record practice. Weekly face-to-face meeting with trial coordinator to reinforce technique and aid compliance. Control group received no instruction on massage
Outcomes	Mode of delivery, incidence of episiotomy, incidence of perineal tear
Notes	Article in Japanese. Unable to communicate with author for further clarification

Risk of bias

Item	**Authors' judgement**	**Description**
Adequate sequence generation?	Unclear	Not described
Allocation concealment?	Yes	A - The method described appears to have successfully concealed allocation
Blinding? All outcomes	Unclear	Participants were asked not to tell healthcare providers their assignment. No process documented to check blinding
Incomplete outcome data addressed? All outcomes	Yes	A - All participants entered into trial included in the analysis
Free of selective reporting?	Unclear	Article in Japanese. Unable to communicate with author for further clarification
Free of other bias?	Yes	

Shipman 1997

Methods	Computer generated random numbers. Concealment of allocation by indistinguishable, sealed, numbered envelopes. Participants asked not to tell their healthcare providers their assignment. No formal assessment to check blinding but "random checks by trial research midwife indicated that midwives were blind to the group allocation". Outcomes for 179 women who did not deliver vaginally not reported but clarified following correspondence from author
Participants	861 women without previous vaginal birth between 29 to 32 weeks, singleton. Excluded if high likelihood of delivery by caesarean section, history of genital herpes during pregnancy, allergy to nuts (contained in massage oil), inability to understand instructions or already practising perineal massage
Interventions	Woman or partner performed four minute perineal massage 3-4 times per week from 34 weeks. one or two fingers introduced 5 cm in vagina, applying sweeping downward pressure from 3:00 to 9:00 using provided sweet almond oil. Women given verbal and written instructions. Given diary to record daily practice. Control group received no instruction on massage. Both intervention and control groups encouraged to perform pelvic floor exercises
Outcomes	Mode of delivery, incidence of perineal trauma.
Notes	Contact with author provided incidence of episiotomy and perineal tears, length of second stage, and results by frequency of massage

Risk of bias

Item	**Authors' judgement**	**Description**
Adequate sequence generation?	Yes	Computer generated random numbers.
Allocation concealment?	Yes	A - Concealment of allocation by indistinguishable, sealed, numbered envelopes
Blinding? All outcomes	Unclear	Participants asked not to tell their healthcare providers their assignment. No formal assessment to check blinding but "random checks by trial research midwife indicated that midwives were blind to the group allocation"
Incomplete outcome data addressed? All outcomes	Yes	A - Outcomes for 179 women who did not deliver vaginally not reported but clarified following correspondence from author
Free of selective reporting?	Yes	Contact with author provided incidence of episiotomy and perineal tears, length of second stage, and results by frequency of massage

Shipman 1997 (*Continued*)

Free of other bias?	Yes	

Characteristics of excluded studies *[ordered by study ID]*

Study	Reason for exclusion
Avery 1986	Inadequate allocation concealment. Although women asked not to tell their carers their allocation, one in nine women delivered by practitioner who would have instructed in perineal massage. No method of assessing maintenance of blinding. Large numbers of exclusions. Contact with author revealed significant withdrawal of participants in intervention group
Mei-Dan 2004	This is not a randomised controlled trial. Women recruited to this trial could choose whether or not to join the intervention group or study group

DATA AND ANALYSES

Comparison 1. Digital perineal massage versus control: results by parity

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Perineal trauma requiring suturing	4	2480	Risk Ratio (M-H, Fixed, 95% CI)	0.91 [0.86, 0.96]
1.1 Women without previous vaginal birth	4	1988	Risk Ratio (M-H, Fixed, 95% CI)	0.90 [0.84, 0.96]
1.2 Women with previous vaginal birth	1	492	Risk Ratio (M-H, Fixed, 95% CI)	0.95 [0.83, 1.08]
2 1st degree perineal tear	4	2480	Risk Ratio (M-H, Fixed, 95% CI)	0.96 [0.79, 1.16]
2.1 Women without previous vaginal birth	4	1988	Risk Ratio (M-H, Fixed, 95% CI)	0.93 [0.74, 1.18]
2.2 Women with previous vaginal birth	1	492	Risk Ratio (M-H, Fixed, 95% CI)	1.01 [0.72, 1.41]
3 2nd degree perineal tear	4	2480	Risk Ratio (M-H, Fixed, 95% CI)	0.99 [0.85, 1.15]
3.1 Women without previous vaginal birth	4	1988	Risk Ratio (M-H, Fixed, 95% CI)	1.00 [0.84, 1.19]
3.2 Women with previous vaginal birth	1	492	Risk Ratio (M-H, Fixed, 95% CI)	0.96 [0.72, 1.29]
4 3rd or 4th degree perineal trauma	4	2480	Risk Ratio (M-H, Fixed, 95% CI)	0.81 [0.56, 1.18]
4.1 Women without previous vaginal birth	4	1988	Risk Ratio (M-H, Fixed, 95% CI)	0.82 [0.56, 1.20]
4.2 Women with previous vaginal birth	1	492	Risk Ratio (M-H, Fixed, 95% CI)	0.50 [0.05, 5.52]
5 Incidence of episiotomy	4	2480	Risk Ratio (M-H, Fixed, 95% CI)	0.84 [0.74, 0.95]
5.1 Women without previous vaginal birth	4	1988	Risk Ratio (M-H, Fixed, 95% CI)	0.83 [0.73, 0.95]
5.2 Women with previous vaginal birth	1	492	Risk Ratio (M-H, Fixed, 95% CI)	0.86 [0.57, 1.30]
6 Length of second stage	2	2211	Mean Difference (IV, Fixed, 95% CI)	3.84 [-0.26, 7.95]
6.1 Women without previous vaginal birth	2	1719	Mean Difference (IV, Fixed, 95% CI)	2.16 [-3.58, 7.91]
6.2 Women with previous vaginal birth	1	492	Mean Difference (IV, Fixed, 95% CI)	5.60 [-0.27, 11.47]
7 Instrumental delivery	3	2417	Risk Ratio (M-H, Fixed, 95% CI)	0.94 [0.81, 1.08]
7.1 Women without previous vaginal birth	3	1925	Risk Ratio (M-H, Fixed, 95% CI)	0.90 [0.78, 1.04]
7.2 Women with previous vaginal birth	1	492	Risk Ratio (M-H, Fixed, 95% CI)	1.58 [0.83, 3.02]
8 Length of inpatient stay	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
8.1 Women without previous vaginal birth	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
8.2 Women with previous vaginal birth	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable

9 Admission to nursery	0	0	Risk Ratio (M-H, Fixed, 95% CI)	Not estimable
9.1 Women without previous vaginal birth	0	0	Risk Ratio (M-H, Fixed, 95% CI)	Not estimable
9.2 Women with previous vaginal birth	0	0	Risk Ratio (M-H, Fixed, 95% CI)	Not estimable
10 Apgar < 4 at 1 minute and/or Apgar < 7 at 5 minutes	0	0	Risk Ratio (M-H, Fixed, 95% CI)	Not estimable
10.1 Women without previous vaginal birth	0	0	Risk Ratio (M-H, Fixed, 95% CI)	Not estimable
10.2 Women with previous vaginal birth	0	0	Risk Ratio (M-H, Fixed, 95% CI)	Not estimable
11 Woman's satisfaction with perineal massage	0	0	Risk Ratio (M-H, Fixed, 95% CI)	Not estimable
11.1 Women without previous vaginal birth	0	0	Risk Ratio (M-H, Fixed, 95% CI)	Not estimable
11.2 Women with previous vaginal birth	0	0	Risk Ratio (M-H, Fixed, 95% CI)	Not estimable
12 Perineal pain postpartum	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
12.1 Women without previous vaginal birth	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
12.2 Women with previous vaginal birth	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
13 Perineal pain at 3 months postpartum	1	931	Risk Ratio (M-H, Fixed, 95% CI)	0.68 [0.50, 0.91]
13.1 Women without previous vaginal birth	1	555	Risk Ratio (M-H, Fixed, 95% CI)	0.77 [0.55, 1.09]
13.2 Women with previous vaginal birth	1	376	Risk Ratio (M-H, Fixed, 95% CI)	0.45 [0.24, 0.87]
14 Painful sex at 3 months postpartum	1	831	Risk Ratio (M-H, Fixed, 95% CI)	0.96 [0.84, 1.08]
14.1 Women without previous vaginal birth	1	493	Risk Ratio (M-H, Fixed, 95% CI)	0.97 [0.85, 1.11]
14.2 Women with previous vaginal birth	1	338	Risk Ratio (M-H, Fixed, 95% CI)	0.92 [0.68, 1.24]
15 Woman's sexual satisfaction at 3 months postpartum	1	921	Risk Ratio (M-H, Fixed, 95% CI)	1.02 [0.96, 1.10]
15.1 Women without previous vaginal birth	1	552	Risk Ratio (M-H, Fixed, 95% CI)	1.03 [0.93, 1.14]
15.2 Women with previous vaginal birth	1	369	Risk Ratio (M-H, Fixed, 95% CI)	1.02 [0.93, 1.11]
16 Partner's sexual satisfaction at 3 months postpartum	1	916	Risk Ratio (M-H, Fixed, 95% CI)	0.97 [0.91, 1.04]
16.1 Women without previous vaginal birth	1	548	Risk Ratio (M-H, Fixed, 95% CI)	0.99 [0.90, 1.09]
16.2 Women with previous vaginal birth	1	368	Risk Ratio (M-H, Fixed, 95% CI)	0.94 [0.87, 1.03]
17 Uncontrolled loss of urine at 3 months postpartum	1	949	Risk Ratio (M-H, Fixed, 95% CI)	0.90 [0.74, 1.08]
17.1 Women without previous vaginal birth	1	572	Risk Ratio (M-H, Fixed, 95% CI)	0.92 [0.71, 1.20]

17.2 Women with previous vaginal birth	1	377	Risk Ratio (M-H, Fixed, 95% CI)	0.87 [0.66, 1.13]
18 Uncontrolled loss of faeces at 3 months postpartum	1	948	Risk Ratio (M-H, Fixed, 95% CI)	0.72 [0.35, 1.49]
18.1 Women without previous vaginal birth	1	572	Risk Ratio (M-H, Fixed, 95% CI)	1.02 [0.41, 2.54]
18.2 Women with previous vaginal birth	1	376	Risk Ratio (M-H, Fixed, 95% CI)	0.38 [0.10, 1.41]
19 Uncontrolled loss of flatus at 3 months postpartum	1	948	Risk Ratio (M-H, Fixed, 95% CI)	1.09 [0.88, 1.36]
19.1 Women without previous vaginal birth	1	571	Risk Ratio (M-H, Fixed, 95% CI)	1.13 [0.85, 1.50]
19.2 Women with previous vaginal birth	1	377	Risk Ratio (M-H, Fixed, 95% CI)	1.04 [0.74, 1.45]

Comparison 2. Digital perineal massage versus control: results by frequency of massage

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Perineal trauma requiring suturing	3		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
1.1 Average number of massages per week < 1.5	2	1500	Risk Ratio (M-H, Fixed, 95% CI)	0.83 [0.75, 0.92]
1.2 Average number of massages per week = 1.5 to 3.4	2	1650	Risk Ratio (M-H, Fixed, 95% CI)	0.92 [0.85, 1.00]
1.3 Average number of massages per week > 3.5	2	1598	Risk Ratio (M-H, Fixed, 95% CI)	0.93 [0.86, 1.02]
1.4 Any frequency of massage	3	2417	Risk Ratio (M-H, Fixed, 95% CI)	0.91 [0.86, 0.96]
2 1st degree perineal tear	3		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
2.1 Average number of massages per week < 1.5	2	1500	Risk Ratio (M-H, Fixed, 95% CI)	0.95 [0.70, 1.30]
2.2 Average number of massages per week = 1.5 to 3.4	2	1650	Risk Ratio (M-H, Fixed, 95% CI)	1.00 [0.76, 1.33]
2.3 Average number of massages per week > 3.5	2	1598	Risk Ratio (M-H, Fixed, 95% CI)	0.89 [0.67, 1.17]
2.4 Any frequency of massage	3	2417	Risk Ratio (M-H, Fixed, 95% CI)	0.95 [0.78, 1.16]
3 2nd degree perineal tear	3		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
3.1 Average number of massages per week < 1.5	2	1500	Risk Ratio (M-H, Fixed, 95% CI)	1.00 [0.78, 1.27]
3.2 Average number of massages per week = 1.5 to 3.4	2	1650	Risk Ratio (M-H, Fixed, 95% CI)	0.94 [0.75, 1.16]
3.3 Average number of massages per week > 3.5	2	1598	Risk Ratio (M-H, Fixed, 95% CI)	1.02 [0.82, 1.27]
3.4 Any frequency of massage	3	2417	Risk Ratio (M-H, Fixed, 95% CI)	0.98 [0.84, 1.14]
4 3rd or 4th degree perineal trauma	3		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
4.1 Average number of massages per week < 1.5	2	1500	Risk Ratio (M-H, Fixed, 95% CI)	0.40 [0.18, 0.93]

4.2 Average number of massages per week = 1.5 to 3.4	2	1650	Risk Ratio (M-H, Fixed, 95% CI)	0.64 [0.33, 1.25]
4.3 Average number of massages per week > 3.5	2	1598	Risk Ratio (M-H, Fixed, 95% CI)	1.18 [0.77, 1.81]
4.4 Any frequency of massage	3	2417	Risk Ratio (M-H, Fixed, 95% CI)	0.81 [0.56, 1.19]
5 Incidence of episiotomy	3		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
5.1 Average number of massages per week < 1.5	2	1500	Risk Ratio (M-H, Fixed, 95% CI)	0.72 [0.57, 0.91]
5.2 Average number of massages per week = 1.5 to 3.4	2	1650	Risk Ratio (M-H, Fixed, 95% CI)	0.91 [0.77, 1.08]
5.3 Average number of massages per week > 3.5	2	1598	Risk Ratio (M-H, Fixed, 95% CI)	0.84 [0.67, 1.04]
5.4 Any frequency of massage	3	2417	Risk Ratio (M-H, Fixed, 95% CI)	0.85 [0.75, 0.97]
6 Length of second stage	2		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
6.1 Average number of massages per week < 1.5	2	1403	Mean Difference (IV, Fixed, 95% CI)	0.97 [-6.45, 8.39]
6.2 Average number of massages per week = 1.5 to 3.4	2	1525	Mean Difference (IV, Fixed, 95% CI)	-2.38 [-8.55, 3.79]
6.3 Average number of massages per week > 3.5	2	1509	Mean Difference (IV, Fixed, 95% CI)	10.80 [4.03, 17.58]
6.4 Any frequency of massage	2	2211	Mean Difference (IV, Fixed, 95% CI)	3.35 [-1.29, 8.00]
7 Instrumental delivery	3		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
7.1 Average number of massages per week < 1.5	2	1500	Risk Ratio (M-H, Fixed, 95% CI)	0.90 [0.71, 1.13]
7.2 Average number of massages per week = 1.5 to 3.4	2	1650	Risk Ratio (M-H, Fixed, 95% CI)	0.88 [0.73, 1.07]
7.3 Average number of massages per week > 3.5	2	1598	Risk Ratio (M-H, Fixed, 95% CI)	1.08 [0.87, 1.34]
7.4 Any frequency of massage	3	2417	Risk Ratio (M-H, Fixed, 95% CI)	0.94 [0.81, 1.08]
8 Length of inpatient stay	0		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
8.1 Average number of massages per week < 1.5	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
8.2 Average number of massages per week = 1.5 to 3.4	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
8.3 Average number of massages per week > 3.5	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
8.4 Any frequency of massage	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
9 Admission to nursery	0		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
9.1 Average number of massages per week < 1.5	0	0	Risk Ratio (M-H, Fixed, 95% CI)	Not estimable
9.2 Average number of massages per week = 1.5 to 3.4	0	0	Risk Ratio (M-H, Fixed, 95% CI)	Not estimable
9.3 Average number of massages per week > 3.5	0	0	Risk Ratio (M-H, Fixed, 95% CI)	Not estimable
9.4 Any frequency of massage	0	0	Risk Ratio (M-H, Fixed, 95% CI)	Not estimable
10 Apgar < 4 at 1 minute and/or Apgar < 7 at 5 minutes	0		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
10.1 Average number of massages per week < 1.5	0	0	Risk Ratio (M-H, Fixed, 95% CI)	Not estimable
10.2 Average number of massages per week = 1.5 to 3.4	0	0	Risk Ratio (M-H, Fixed, 95% CI)	Not estimable

10.3 Average number of massages per week > 3.5	0	0	Risk Ratio (M-H, Fixed, 95% CI)	Not estimable
10.4 Any frequency of massage	0	0	Risk Ratio (M-H, Fixed, 95% CI)	Not estimable
11 Woman's satisfaction with perineal massage	0		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
11.1 Average number of massages per week < 1.5	0	0	Risk Ratio (M-H, Fixed, 95% CI)	Not estimable
11.2 Average number of massages per week = 1.5 to 3.4	0	0	Risk Ratio (M-H, Fixed, 95% CI)	Not estimable
11.3 Average number of massages per week > 3.5	0	0	Risk Ratio (M-H, Fixed, 95% CI)	Not estimable
11.4 Any frequency of massage	0	0	Risk Ratio (M-H, Fixed, 95% CI)	Not estimable
12 Perineal pain postpartum	0		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
12.1 Average number of massages per week < 1.5	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
12.2 Average number of massages per week = 1.5 to 3.4	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
12.3 Average number of massages per week > 3.5	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
12.4 Any frequency of massage	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
13 Perineal pain at 3 months postpartum	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
13.1 Average number of massages per week < 1.5	1	577	Risk Ratio (M-H, Fixed, 95% CI)	1.01 [0.65, 1.56]
13.2 Average number of massages per week = 1.5 to 3.4	1	595	Risk Ratio (M-H, Fixed, 95% CI)	0.69 [0.42, 1.13]
13.3 Average number of massages per week > 3.5	1	701	Risk Ratio (M-H, Fixed, 95% CI)	0.51 [0.33, 0.79]
13.4 Any frequency of massage	1	931	Risk Ratio (M-H, Fixed, 95% CI)	0.67 [0.50, 0.92]
14 Painful sex at 3 months postpartum	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
14.1 Average number of massages per week < 1.5	1	521	Risk Ratio (M-H, Fixed, 95% CI)	0.85 [0.67, 1.08]
14.2 Average number of massages per week = 1.5 to 3.4	1	538	Risk Ratio (M-H, Fixed, 95% CI)	1.03 [0.85, 1.25]
14.3 Average number of massages per week > 3.5	1	622	Risk Ratio (M-H, Fixed, 95% CI)	0.96 [0.81, 1.13]
14.4 Any frequency of massage	1	831	Risk Ratio (M-H, Fixed, 95% CI)	0.95 [0.83, 1.09]
15 Woman's sexual satisfaction at 3 months postpartum	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
15.1 Average number of massages per week < 1.5	1	569	Risk Ratio (M-H, Fixed, 95% CI)	1.04 [0.93, 1.16]
15.2 Average number of massages per week = 1.5 to 3.4	1	588	Risk Ratio (M-H, Fixed, 95% CI)	1.08 [0.98, 1.19]
15.3 Average number of massages per week > 3.5	1	692	Risk Ratio (M-H, Fixed, 95% CI)	0.99 [0.90, 1.08]

15.4 Any frequency of massage	1	921	Risk Ratio (M-H, Fixed, 95% CI)	1.02 [0.96, 1.10]
16 Partner's sexual satisfaction at 3 months postpartum	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
16.1 Average number of massages per week < 1.5	1	576	Risk Ratio (M-H, Fixed, 95% CI)	1.01 [0.91, 1.11]
16.2 Average number of massages per week = 1.5 to 3.4	1	586	Risk Ratio (M-H, Fixed, 95% CI)	1.03 [0.95, 1.13]
16.3 Average number of massages per week > 3.5	1	688	Risk Ratio (M-H, Fixed, 95% CI)	0.93 [0.86, 1.02]
16.4 Any frequency of massage	1	916	Risk Ratio (M-H, Fixed, 95% CI)	0.97 [0.91, 1.04]
17 Uncontrolled loss of urine at 3 months postpartum	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
17.1 Average number of massages per week < 1.5	1	587	Risk Ratio (M-H, Fixed, 95% CI)	1.10 [0.83, 1.46]
17.2 Average number of massages per week = 1.5 to 3.4	1	606	Risk Ratio (M-H, Fixed, 95% CI)	0.84 [0.62, 1.15]
17.3 Average number of massages per week > 3.5	1	714	Risk Ratio (M-H, Fixed, 95% CI)	0.83 [0.65, 1.06]
17.4 Any frequency of massage	1	949	Risk Ratio (M-H, Fixed, 95% CI)	0.90 [0.74, 1.08]
18 Uncontrolled loss of faeces at 3 months postpartum	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
18.1 Average number of massages per week < 1.5	1	586	Risk Ratio (M-H, Fixed, 95% CI)	1.04 [0.36, 3.03]
18.2 Average number of massages per week = 1.5 to 3.4	1	605	Risk Ratio (M-H, Fixed, 95% CI)	0.44 [0.10, 1.89]
18.3 Average number of massages per week > 3.5	1	713	Risk Ratio (M-H, Fixed, 95% CI)	0.72 [0.29, 1.80]
18.4 Any frequency of massage	1	948	Risk Ratio (M-H, Fixed, 95% CI)	0.72 [0.35, 1.49]
19 Uncontrolled loss of flatus at 3 months postpartum	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
19.1 Average number of massages per week < 1.5	1	587	Risk Ratio (M-H, Fixed, 95% CI)	1.40 [1.03, 1.90]
19.2 Average number of massages per week = 1.5 to 3.4	1	606	Risk Ratio (M-H, Fixed, 95% CI)	0.87 [0.60, 1.26]
19.3 Average number of massages per week > 3.5	1	713	Risk Ratio (M-H, Fixed, 95% CI)	1.07 [0.82, 1.39]
19.4 Any frequency of massage	1	948	Risk Ratio (M-H, Fixed, 95% CI)	1.09 [0.88, 1.36]

Comparison 3. Perineal massage using massaging device versus control: results by parity

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Perineal trauma requiring suturing	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
1.1 Women without previous vaginal birth	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
1.2 Women with previous vaginal birth	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
2 1st degree perineal tear	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
2.1 Women without previous vaginal birth	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
2.2 Women with previous vaginal birth	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
3 2nd degree perineal tear	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
3.1 Women without previous vaginal birth	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
3.2 Women with previous vaginal birth	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
4 3rd or 4th degree perineal trauma	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
4.1 Women without previous vaginal birth	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
4.2 Women with previous vaginal birth	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
5 Incidence of episiotomy	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
5.1 Women without previous vaginal birth	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
5.2 Women with previous vaginal birth	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
6 Length of second stage	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
6.1 Women without previous vaginal birth	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
6.2 Women with previous vaginal birth	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
7 Instrumental delivery	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
7.1 Women without previous vaginal birth	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
7.2 Women with previous vaginal birth	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
8 Length of inpatient stay	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
8.1 Women without previous vaginal birth	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
8.2 Women with previous vaginal birth	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
9 Admission to nursery	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
9.1 Women without previous vaginal birth	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable

9.2 Women with previous vaginal birth	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
10 Apgar < 4 at 1 minute and/or Apgar < 7 at 5 minutes	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
10.1 Women without previous vaginal birth	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
10.2 Women with previous vaginal birth	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
11 Woman's satisfaction with perineal massage	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
11.1 Women without previous vaginal birth	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
11.2 Women with previous vaginal birth	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
12 Perineal pain postpartum	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
12.1 Women without previous vaginal birth	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
12.2 Women with previous vaginal birth	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
13 Perineal pain at 3 months postpartum	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
13.1 Women without previous vaginal birth	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
13.2 Women with previous vaginal birth	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
14 Painful sex at 3 months postpartum	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
14.1 Women without previous vaginal birth	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
14.2 Women with previous vaginal birth	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
15 Woman's sexual satisfaction at 3 months postpartum	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
15.1 Women without previous vaginal birth	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
15.2 Women with previous vaginal birth	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
16 Partner's sexual satisfaction at 3 months postpartum	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
16.1 Women without previous vaginal birth	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
16.2 Women with previous vaginal birth	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
17 Uncontrolled loss of urine at 3 months postpartum	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
17.1 Women without previous vaginal birth	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
17.2 Women with previous vaginal birth	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
18 Uncontrolled loss of faeces at 3 months postpartum	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable

18.1 Women without previous vaginal birth	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
18.2 Women with previous vaginal birth	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
19 Uncontrolled loss of flatus at 3 months postpartum	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
19.1 Women without previous vaginal birth	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
19.2 Women with previous vaginal birth	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable

Comparison 4. Perineal massage using massaging device versus control: results by frequency of massage

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Perineal trauma requiring suturing	0		Odds Ratio (M-H, Fixed, 95% CI)	Subtotals only
1.1 Average number of massages per week < 1.5	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
1.2 Average number of massages per week = 1.5 to 3.4	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
1.3 Average number of massages per week > 3.5	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
1.4 Any frequency of massage	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
2 1st degree perineal tear	0		Odds Ratio (M-H, Fixed, 95% CI)	Subtotals only
2.1 Average number of massages per week < 1.5	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
2.2 Average number of massages per week = 1.5 to 3.4	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
2.3 Average number of massages per week > 3.5	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
2.4 Any frequency of massage	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
3 2nd degree perineal tear	0		Odds Ratio (M-H, Fixed, 95% CI)	Subtotals only
3.1 Average number of massages per week < 1.5	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
3.2 Average number of massages per week = 1.5 to 3.4	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
3.3 Average number of massages per week > 3.5	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
3.4 Any frequency of massage	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
4 3rd or 4th degree perineal trauma	0		Odds Ratio (M-H, Fixed, 95% CI)	Subtotals only
4.1 Average number of massages per week < 1.5	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
4.2 Average number of massages per week = 1.5 to 3.4	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
4.3 Average number of massages per week > 3.5	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable

4.4 Any frequency of massage	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
5 Incidence of episiotomy	0		Odds Ratio (M-H, Fixed, 95% CI)	Subtotals only
5.1 Average number of massages per week < 1.5	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
5.2 Average number of massages per week = 1.5 to 3.4	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
5.3 Average number of massages per week > 3.5	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
5.4 Any frequency of massage	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
6 Length of second stage	0		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
6.1 Average number of massages per week < 1.5	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
6.2 Average number of massages per week = 1.5 to 3.4	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
6.3 Average number of massages per week > 3.5	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
6.4 Any frequency of massage	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
7 Instrumental delivery	0		Odds Ratio (M-H, Fixed, 95% CI)	Subtotals only
7.1 Average number of massages per week < 1.5	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
7.2 Average number of massages per week = 1.5 to 3.4	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
7.3 Average number of massages per week > 3.5	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
7.4 Any frequency of massage	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
8 Length of inpatient stay	0		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
8.1 Average number of massages per week < 1.5	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
8.2 Average number of massages per week = 1.5 to 3.4	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
8.3 Average number of massages per week > 3.5	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
8.4 Any frequency of massage	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
9 Admission to nursery	0		Odds Ratio (M-H, Fixed, 95% CI)	Subtotals only
9.1 Average number of massages per week < 1.5	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
9.2 Average number of massages per week = 1.5 to 3.4	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
9.3 Average number of massages per week > 3.5	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
9.4 Any frequency of massage	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
10 Apgar < 4 at 1 minute and/or Apgar < 7 at 5 minutes	0		Odds Ratio (M-H, Fixed, 95% CI)	Subtotals only
10.1 Average number of massages per week < 1.5	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
10.2 Average number of massages per week = 1.5 to 3.4	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
10.3 Average number of massages per week > 3.5	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
10.4 Any frequency of massage	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable

11 Woman's satisfaction with perineal massage	0		Odds Ratio (M-H, Fixed, 95% CI)	Subtotals only
11.1 Average number of massages per week < 1.5	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
11.2 Average number of massages per week = 1.5 to 3.4	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
11.3 Average number of massages per week > 3.5	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
11.4 Any frequency of massage	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
12 Perineal pain postpartum	0		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
12.1 Average number of massages per week < 1.5	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
12.2 Average number of massages per week = 1.5 to 3.4	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
12.3 Average number of massages per week > 3.5	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
12.4 Any frequency of massage	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
13 Perineal pain at 3 months postpartum	0		Odds Ratio (M-H, Fixed, 95% CI)	Subtotals only
13.1 Average number of massages per week < 1.5	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
13.2 Average number of massages per week = 1.5 to 3.4	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
13.3 Average number of massages per week > 3.5	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
13.4 Any frequency of massage	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
14 Painful sex at 3 months postpartum	0		Odds Ratio (M-H, Fixed, 95% CI)	Subtotals only
14.1 Average number of massages per week < 1.5	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
14.2 Average number of massages per week = 1.5 to 3.4	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
14.3 Average number of massages per week > 3.5	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
14.4 Any frequency of massage	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
15 Woman's sexual satisfaction at 3 months postpartum	0		Odds Ratio (M-H, Fixed, 95% CI)	Subtotals only
15.1 Average number of massages per week < 1.5	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
15.2 Average number of massages per week = 1.5 to 3.4	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
15.3 Average number of massages per week > 3.5	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
15.4 Any frequency of massage	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
16 Partner's sexual satisfaction at 3 months postpartum	0		Odds Ratio (M-H, Fixed, 95% CI)	Subtotals only

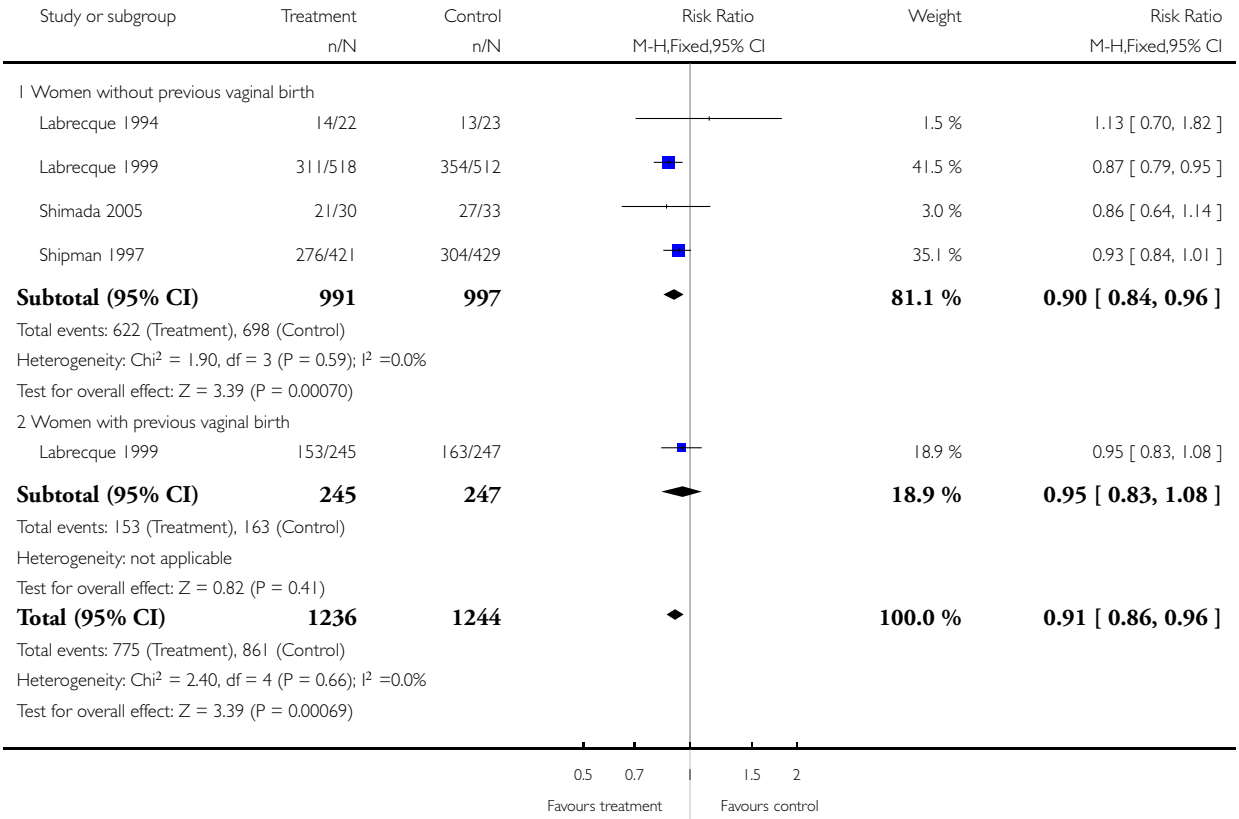
16.1 Average number of massages per week < 1.5	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
16.2 Average number of massages per week = 1.5 to 3.4	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
16.3 Average number of massages per week >3.5	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
16.4 Any frequency of massage	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
17 Uncontrolled loss of urine at 3 months postpartum	0		Odds Ratio (M-H, Fixed, 95% CI)	Subtotals only
17.1 Average number of massages per week < 1.5	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
17.2 Average number of massages per week = 1.5 to 3.4	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
17.3 Average number of massages per week > 3.5	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
17.4 Any frequency of massage	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
18 Uncontrolled loss of faeces at 3 months postpartum	0		Odds Ratio (M-H, Fixed, 95% CI)	Subtotals only
18.1 Average number of massages per week < 1.5	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
18.2 Average number of massages per week = 1.5 to 3.4	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
18.3 Average number of massages per week > 3.5	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
18.4 Any frequency of massage	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
19 Uncontrolled loss of flatus at 3 months postpartum	0		Odds Ratio (M-H, Fixed, 95% CI)	Subtotals only
19.1 Average number of massages per week < 1.5	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
19.2 Average number of massages per week = 1.5 to 3.4	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
19.3 Average number of massages per week > 3.5	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
19.4 Any frequency of massage	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable

Analysis 1.1. Comparison 1 Digital perineal massage versus control: results by parity, Outcome 1 Perineal trauma requiring suturing.

Review: Antenatal perineal massage for reducing perineal trauma

Comparison: 1 Digital perineal massage versus control: results by parity

Outcome: 1 Perineal trauma requiring suturing

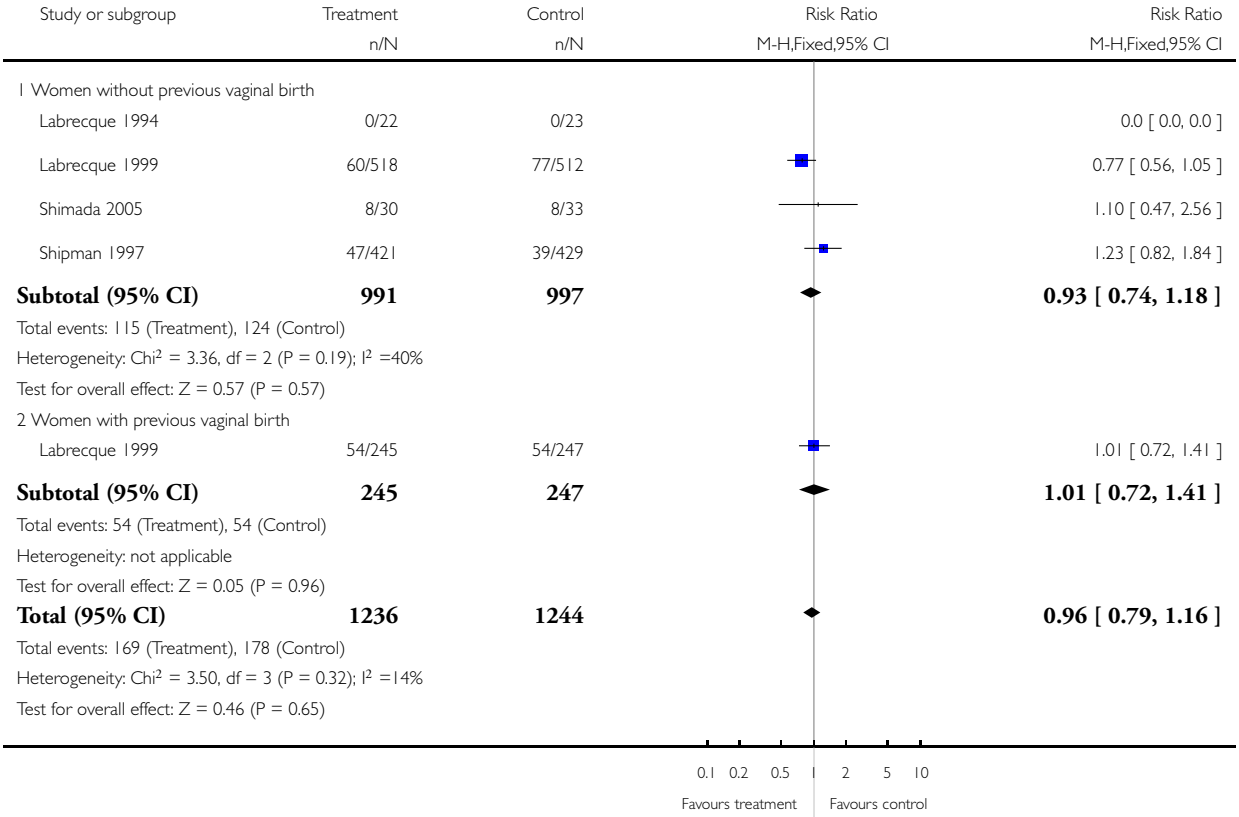


Analysis 1.2. Comparison 1 Digital perineal massage versus control: results by parity, Outcome 2 1st degree perineal tear.

Review: Antenatal perineal massage for reducing perineal trauma

Comparison: 1 Digital perineal massage versus control: results by parity

Outcome: 2 1st degree perineal tear

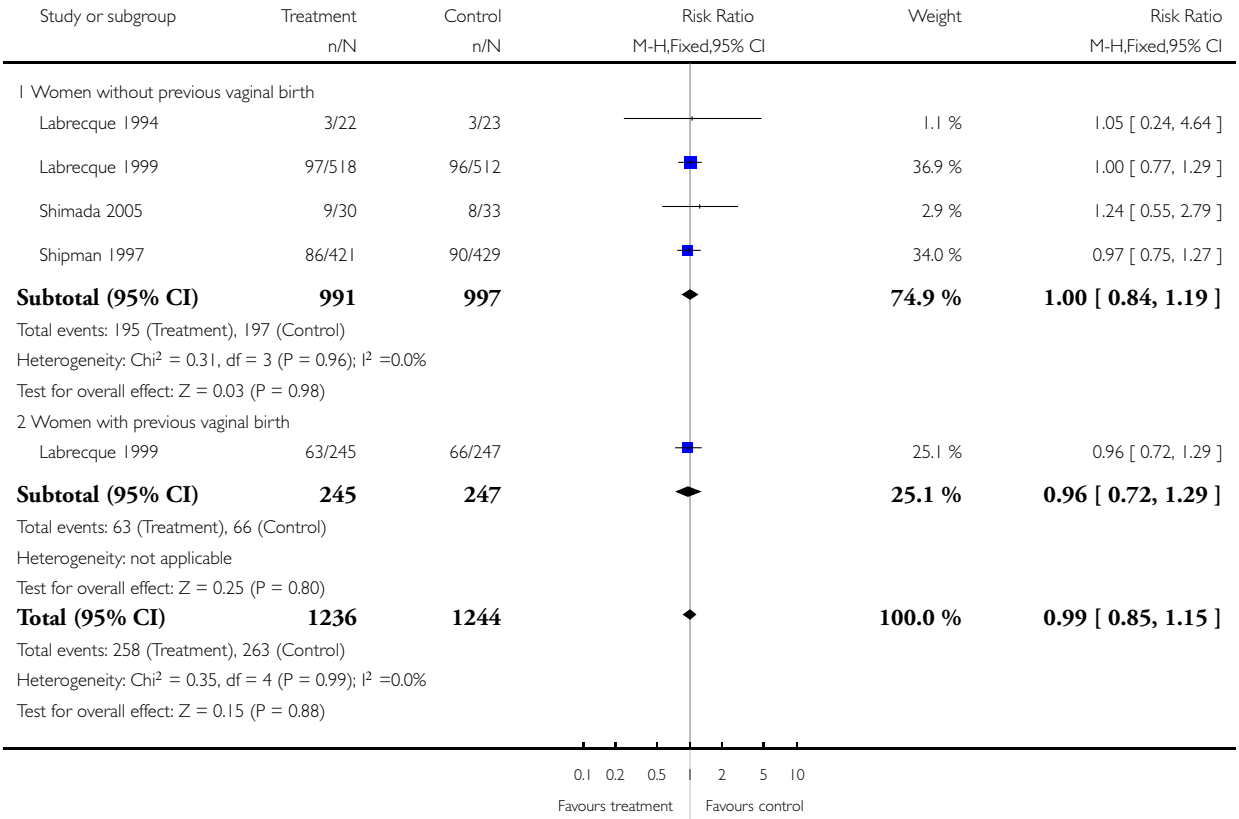


Analysis 1.3. Comparison 1 Digital perineal massage versus control: results by parity, Outcome 3 2nd degree perineal tear.

Review: Antenatal perineal massage for reducing perineal trauma

Comparison: 1 Digital perineal massage versus control: results by parity

Outcome: 3 2nd degree perineal tear

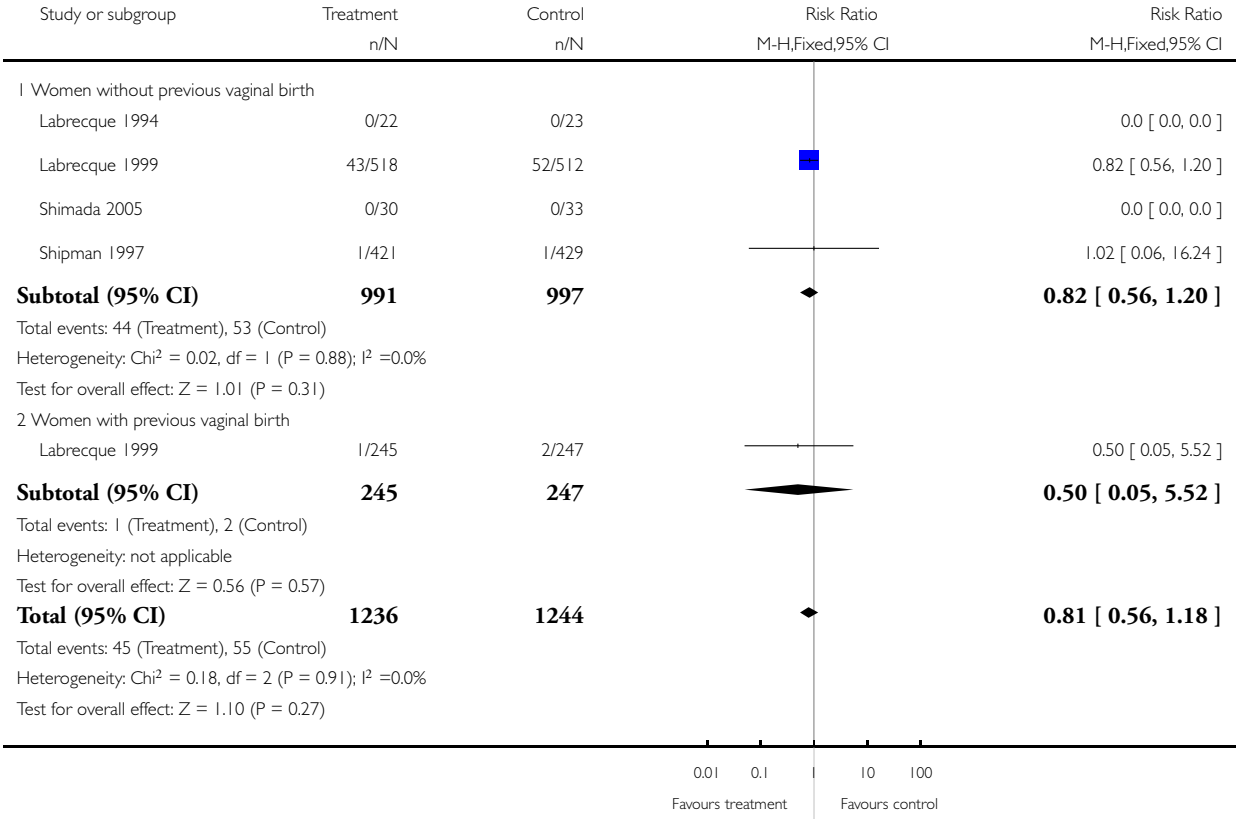


Analysis 1.4. Comparison 1 Digital perineal massage versus control: results by parity, Outcome 4 3rd or 4th degree perineal trauma.

Review: Antenatal perineal massage for reducing perineal trauma

Comparison: 1 Digital perineal massage versus control: results by parity

Outcome: 4 3rd or 4th degree perineal trauma

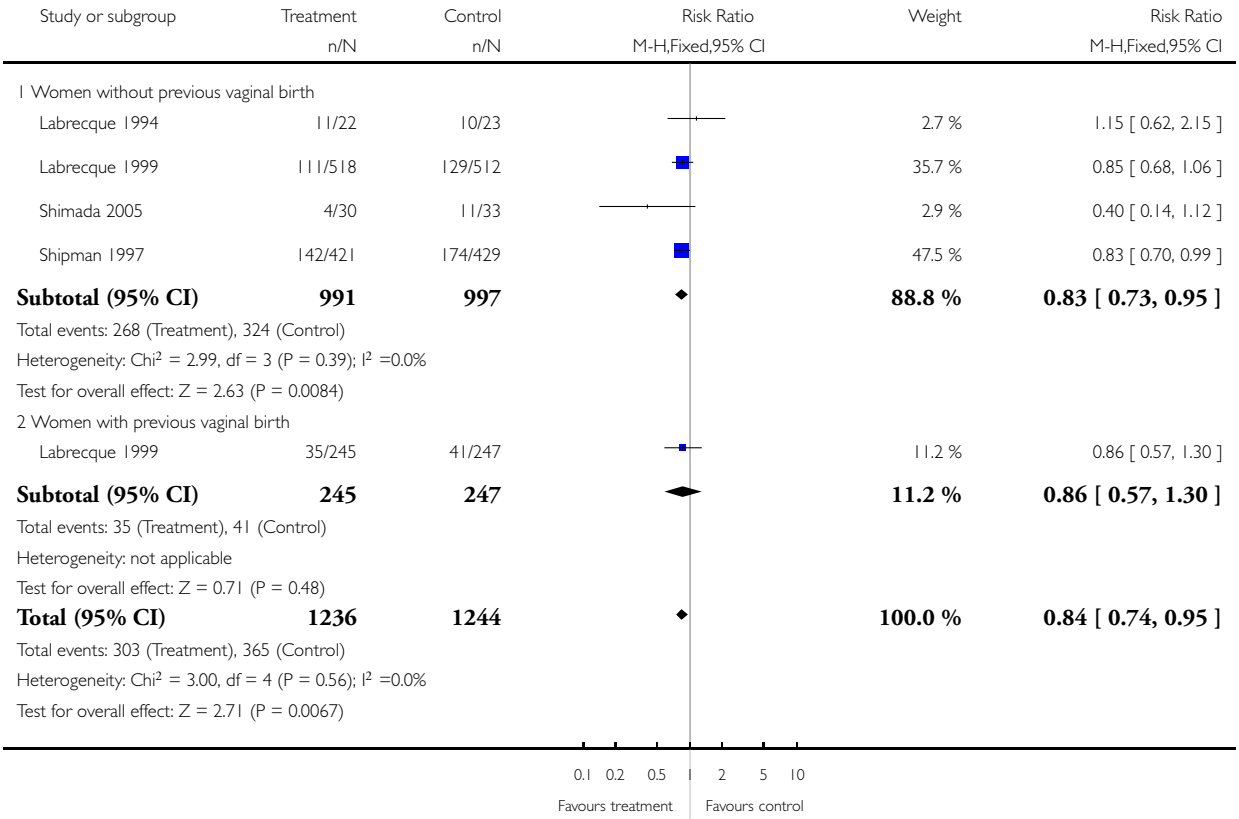


Analysis 1.5. Comparison 1 Digital perineal massage versus control: results by parity, Outcome 5 Incidence of episiotomy.

Review: Antenatal perineal massage for reducing perineal trauma

Comparison: 1 Digital perineal massage versus control: results by parity

Outcome: 5 Incidence of episiotomy



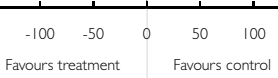
Analysis 1.6. Comparison 1 Digital perineal massage versus control: results by parity, Outcome 6 Length of second stage.

Review: Antenatal perineal massage for reducing perineal trauma

Comparison: 1 Digital perineal massage versus control: results by parity

Outcome: 6 Length of second stage

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Weight	Mean Difference IV,Fixed,95% CI
1 Women without previous vaginal birth							
Labrecque 1999	518	89.9 (63.4)	512	85.9 (60.7)		29.3 %	4.00 [-3.58, 11.58]
Shipman 1997	335	86.74 (57.08)	354	87.06 (60.88)		21.7 %	-0.32 [-9.13, 8.49]
Subtotal (95% CI)	**853**		**866**			**51.1 %**	**2.16 [-3.58, 7.91]**
Heterogeneity: Chi^2 = 0.53, df = 1 (P = 0.47); I^2 =0.0%							
Test for overall effect: Z = 0.74 (P = 0.46)							
2 Women with previous vaginal birth							
Labrecque 1999	245	31.8 (38.2)	247	26.2 (27.3)		48.9 %	5.60 [-0.27, 11.47]
Subtotal (95% CI)	**245**		**247**			**48.9 %**	**5.60 [-0.27, 11.47]**
Heterogeneity: not applicable							
Test for overall effect: Z = 1.87 (P = 0.062)							
Total (95% CI)	**1098**		**1113**			**100.0 %**	**3.84 [-0.26, 7.95]**
Heterogeneity: Chi^2 = 1.20, df = 2 (P = 0.55); I^2 =0.0%							
Test for overall effect: Z = 1.83 (P = 0.067)							
Test for subgroup differences: Chi^2 = 0.67, df = 1 (P = 0.41), I^2 =0.0%							

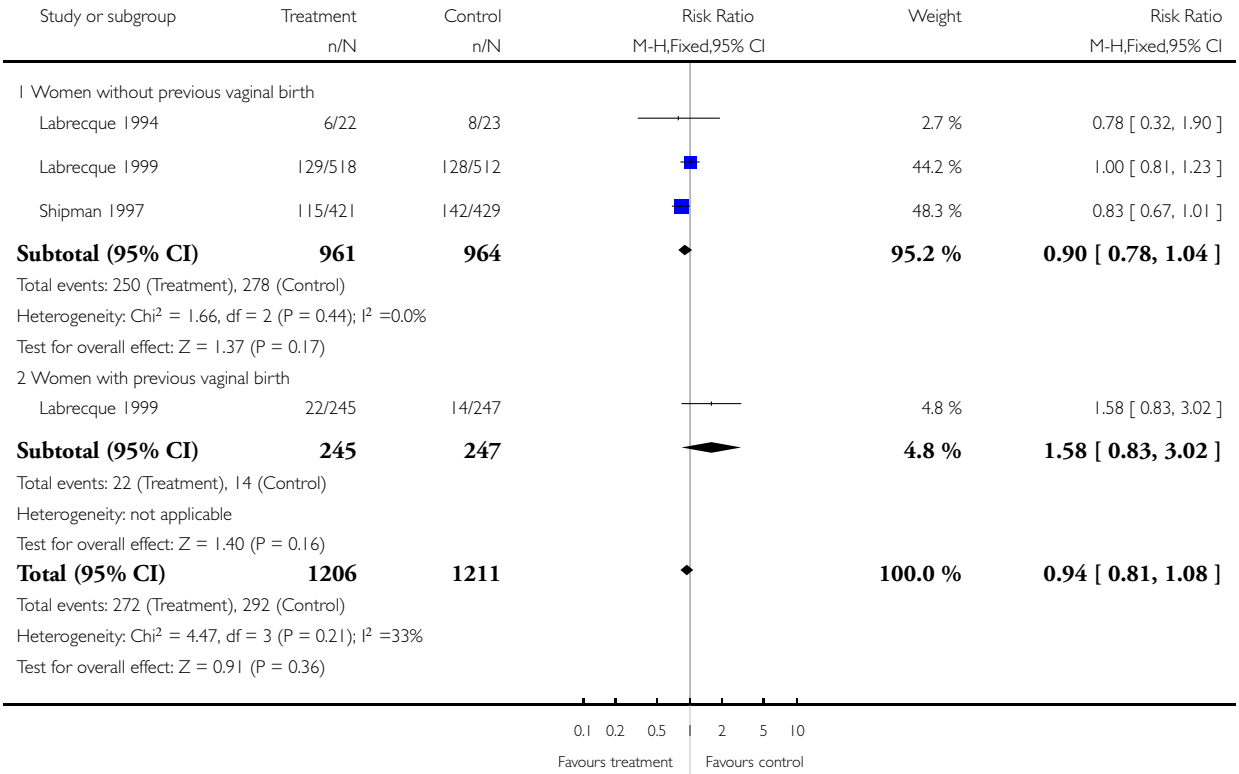


Analysis 1.7. Comparison 1 Digital perineal massage versus control: results by parity, Outcome 7 Instrumental delivery.

Review: Antenatal perineal massage for reducing perineal trauma

Comparison: 1 Digital perineal massage versus control: results by parity

Outcome: 7 Instrumental delivery

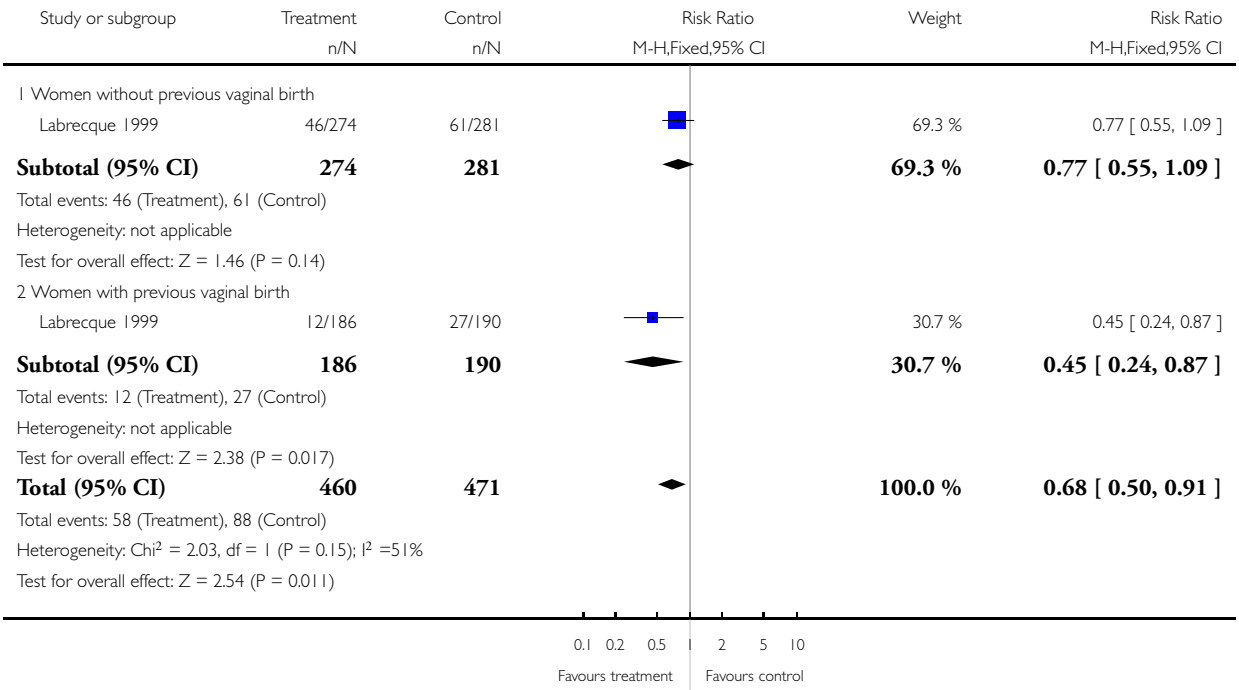


Analysis 1.13. Comparison 1 Digital perineal massage versus control: results by parity, Outcome 13 Perineal pain at 3 months postpartum.

Review: Antenatal perineal massage for reducing perineal trauma

Comparison: 1 Digital perineal massage versus control: results by parity

Outcome: 13 Perineal pain at 3 months postpartum

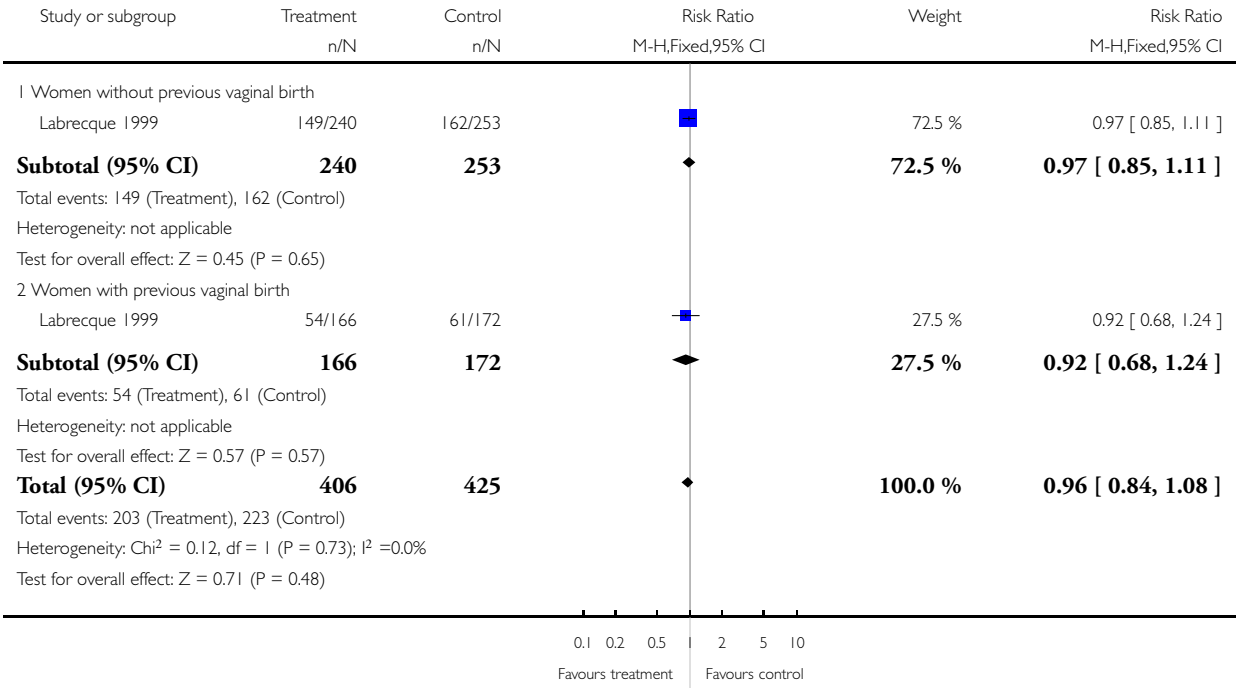


Analysis 1.14. Comparison 1 Digital perineal massage versus control: results by parity, Outcome 14 Painful sex at 3 months postpartum.

Review: Antenatal perineal massage for reducing perineal trauma

Comparison: 1 Digital perineal massage versus control: results by parity

Outcome: 14 Painful sex at 3 months postpartum



Analysis 1.15. Comparison 1 Digital perineal massage versus control: results by parity, Outcome 15 Woman's sexual satisfaction at 3 months postpartum.

Review: Antenatal perineal massage for reducing perineal trauma

Comparison: 1 Digital perineal massage versus control: results by parity

Outcome: 15 Woman's sexual satisfaction at 3 months postpartum

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Weight	Risk Ratio M-H,Fixed,95% CI
1 Women without previous vaginal birth					
Labrecque 1999	203/273	202/279		56.4 %	1.03 [0.93, 1.14]
Subtotal (95% CI)	**273**	**279**		**56.4 %**	**1.03 [0.93, 1.14]**
Total events: 203 (Treatment), 202 (Control)					
Heterogeneity: not applicable					
Test for overall effect: Z = 0.52 (P = 0.60)					
2 Women with previous vaginal birth					
Labrecque 1999	157/184	155/185		43.6 %	1.02 [0.93, 1.11]
Subtotal (95% CI)	**184**	**185**		**43.6 %**	**1.02 [0.93, 1.11]**
Total events: 157 (Treatment), 155 (Control)					
Heterogeneity: not applicable					
Test for overall effect: Z = 0.41 (P = 0.68)					
Total (95% CI)	**457**	**464**		**100.0 %**	**1.02 [0.96, 1.10]**
Total events: 360 (Treatment), 357 (Control)					
Heterogeneity: Chi^2 = 0.02, df = 1 (P = 0.90); I^2 =0.0%					
Test for overall effect: Z = 0.66 (P = 0.51)					

Analysis 1.16. Comparison 1 Digital perineal massage versus control: results by parity, Outcome 16 Partner's sexual satisfaction at 3 months postpartum.

Review: Antenatal perineal massage for reducing perineal trauma

Comparison: 1 Digital perineal massage versus control: results by parity

Outcome: 16 Partner's sexual satisfaction at 3 months postpartum

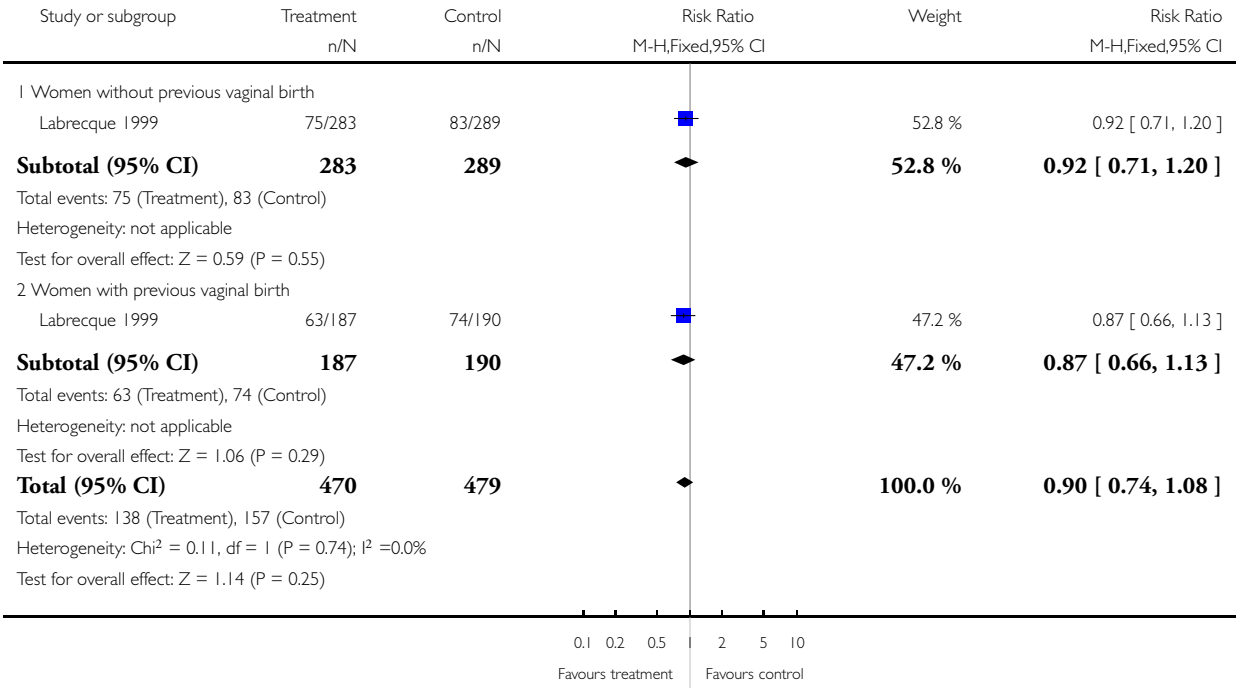
Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Weight	Risk Ratio M-H,Fixed,95% CI
1 Women without previous vaginal birth					
Labrecque 1999	205/270	213/278		56.4 %	0.99 [0.90, 1.09]
Subtotal (95% CI)	**270**	**278**		**56.4 %**	**0.99 [0.90, 1.09]**
Total events: 205 (Treatment), 213 (Control)					
Heterogeneity: not applicable					
Test for overall effect: Z = 0.19 (P = 0.85)					
2 Women with previous vaginal birth					
Labrecque 1999	153/184	162/184		43.6 %	0.94 [0.87, 1.03]
Subtotal (95% CI)	**184**	**184**		**43.6 %**	**0.94 [0.87, 1.03]**
Total events: 153 (Treatment), 162 (Control)					
Heterogeneity: not applicable					
Test for overall effect: Z = 1.33 (P = 0.18)					
Total (95% CI)	**454**	**462**		**100.0 %**	**0.97 [0.91, 1.04]**
Total events: 358 (Treatment), 375 (Control)					
Heterogeneity: Chi^2 = 0.60, df = 1 (P = 0.44); I^2 =0.0%					
Test for overall effect: Z = 0.91 (P = 0.37)					

Analysis 1.17. Comparison 1 Digital perineal massage versus control: results by parity, Outcome 17 Uncontrolled loss of urine at 3 months postpartum.

Review: Antenatal perineal massage for reducing perineal trauma

Comparison: 1 Digital perineal massage versus control: results by parity

Outcome: 17 Uncontrolled loss of urine at 3 months postpartum

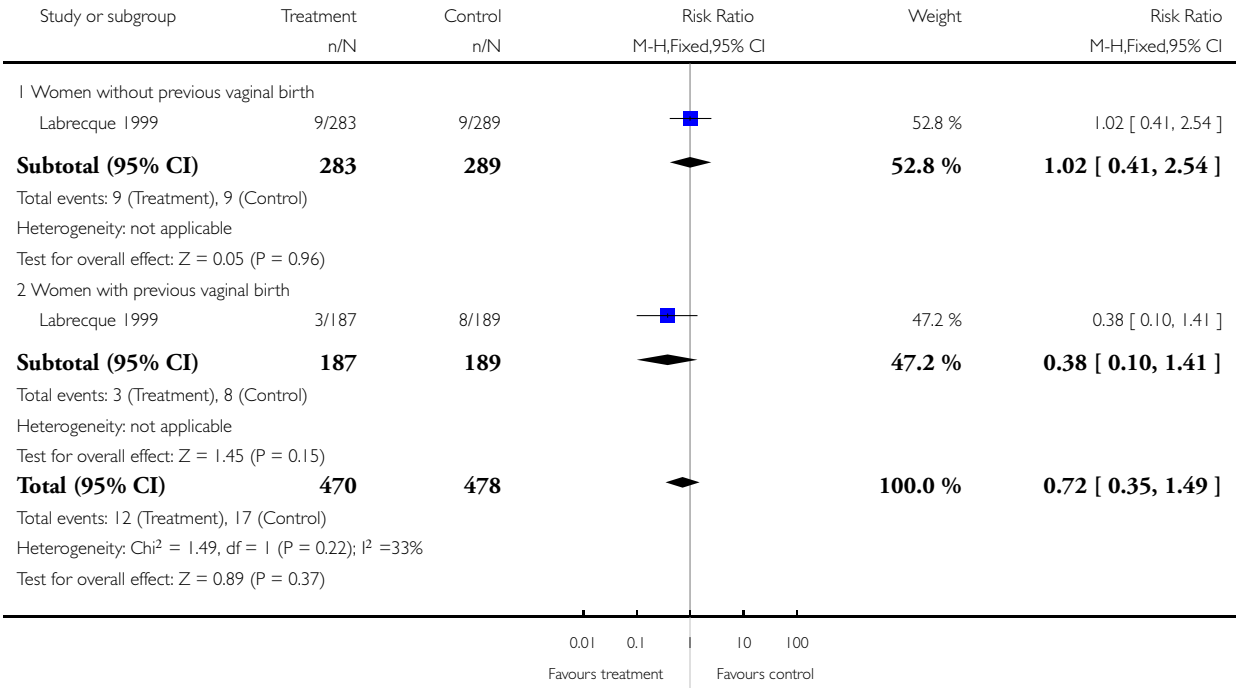


Analysis 1.18. Comparison 1 Digital perineal massage versus control: results by parity, Outcome 18 Uncontrolled loss of faeces at 3 months postpartum.

Review: Antenatal perineal massage for reducing perineal trauma

Comparison: 1 Digital perineal massage versus control: results by parity

Outcome: 18 Uncontrolled loss of faeces at 3 months postpartum

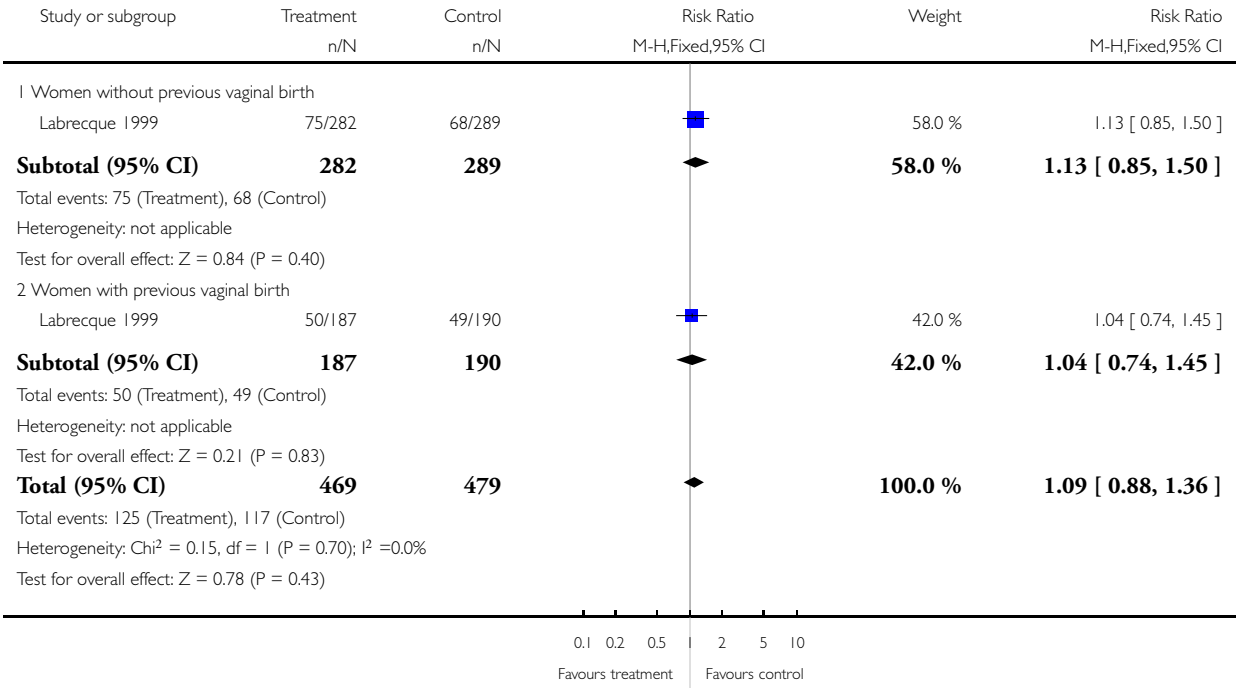


Analysis 1.19. Comparison 1 Digital perineal massage versus control: results by parity, Outcome 19 Uncontrolled loss of flatus at 3 months postpartum.

Review: Antenatal perineal massage for reducing perineal trauma

Comparison: 1 Digital perineal massage versus control: results by parity

Outcome: 19 Uncontrolled loss of flatus at 3 months postpartum



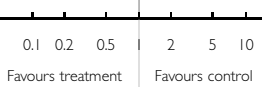
Analysis 2.1. Comparison 2 Digital perineal massage versus control: results by frequency of massage, Outcome 1 Perineal trauma requiring suturing.

Review: Antenatal perineal massage for reducing perineal trauma

Comparison: 2 Digital perineal massage versus control: results by frequency of massage

Outcome: 1 Perineal trauma requiring suturing

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Weight	Risk Ratio M-H,Fixed,95% CI
1 Average number of massages per week < 1.5					
Labrecque 1999	111/206	517/759		64.7 %	0.79 [0.69, 0.91]
Shipman 1997	68/106	304/429		35.3 %	0.91 [0.78, 1.06]
Subtotal (95% CI)	**312**	**1188**		**100.0 %**	**0.83 [0.75, 0.92]**
Total events: 179 (Treatment), 821 (Control)					
Heterogeneity: Chi² = 1.68, df = 1 (P = 0.19); I² =41%					
Test for overall effect: Z = 3.52 (P = 0.00042)					
2 Average number of massages per week = 1.5 to 3.4					
Labrecque 1999	119/196	517/759		47.7 %	0.89 [0.79, 1.01]
Shipman 1997	179/266	304/429		52.3 %	0.95 [0.86, 1.05]
Subtotal (95% CI)	**462**	**1188**		**100.0 %**	**0.92 [0.85, 1.00]**
Total events: 298 (Treatment), 821 (Control)					
Heterogeneity: Chi² = 0.61, df = 1 (P = 0.44); I² =0.0%					
Test for overall effect: Z = 2.01 (P = 0.045)					
3 Average number of massages per week > 3.5					
Labrecque 1999	234/361	517/759		84.2 %	0.95 [0.87, 1.04]
Shipman 1997	29/49	304/429		15.8 %	0.84 [0.66, 1.06]
Subtotal (95% CI)	**410**	**1188**		**100.0 %**	**0.93 [0.86, 1.02]**
Total events: 263 (Treatment), 821 (Control)					
Heterogeneity: Chi² = 1.00, df = 1 (P = 0.32); I² =0.0%					
Test for overall effect: Z = 1.60 (P = 0.11)					
4 Any frequency of massage					
Labrecque 1994	14/22	13/23		1.5 %	1.13 [0.70, 1.82]
Labrecque 1999	464/763	517/759		62.3 %	0.89 [0.83, 0.96]
Shipman 1997	276/421	304/429		36.2 %	0.93 [0.84, 1.01]
Subtotal (95% CI)	**1206**	**1211**		**100.0 %**	**0.91 [0.86, 0.96]**
Total events: 754 (Treatment), 834 (Control)					
Heterogeneity: Chi² = 1.13, df = 2 (P = 0.57); I² =0.0%					
Test for overall effect: Z = 3.27 (P = 0.0011)					

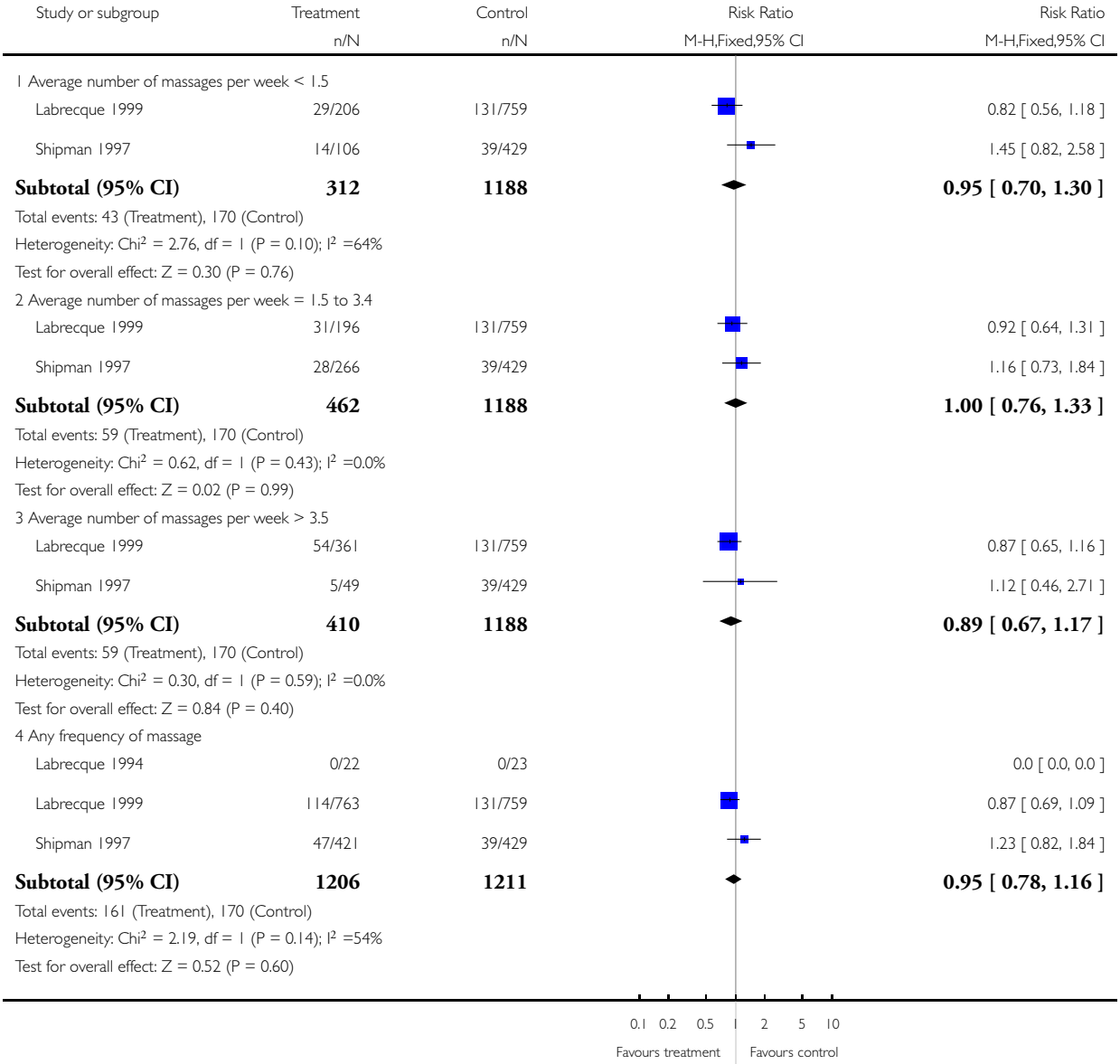


Analysis 2.2. Comparison 2 Digital perineal massage versus control: results by frequency of massage, Outcome 2 1st degree perineal tear.

Review: Antenatal perineal massage for reducing perineal trauma

Comparison: 2 Digital perineal massage versus control: results by frequency of massage

Outcome: 2 1st degree perineal tear

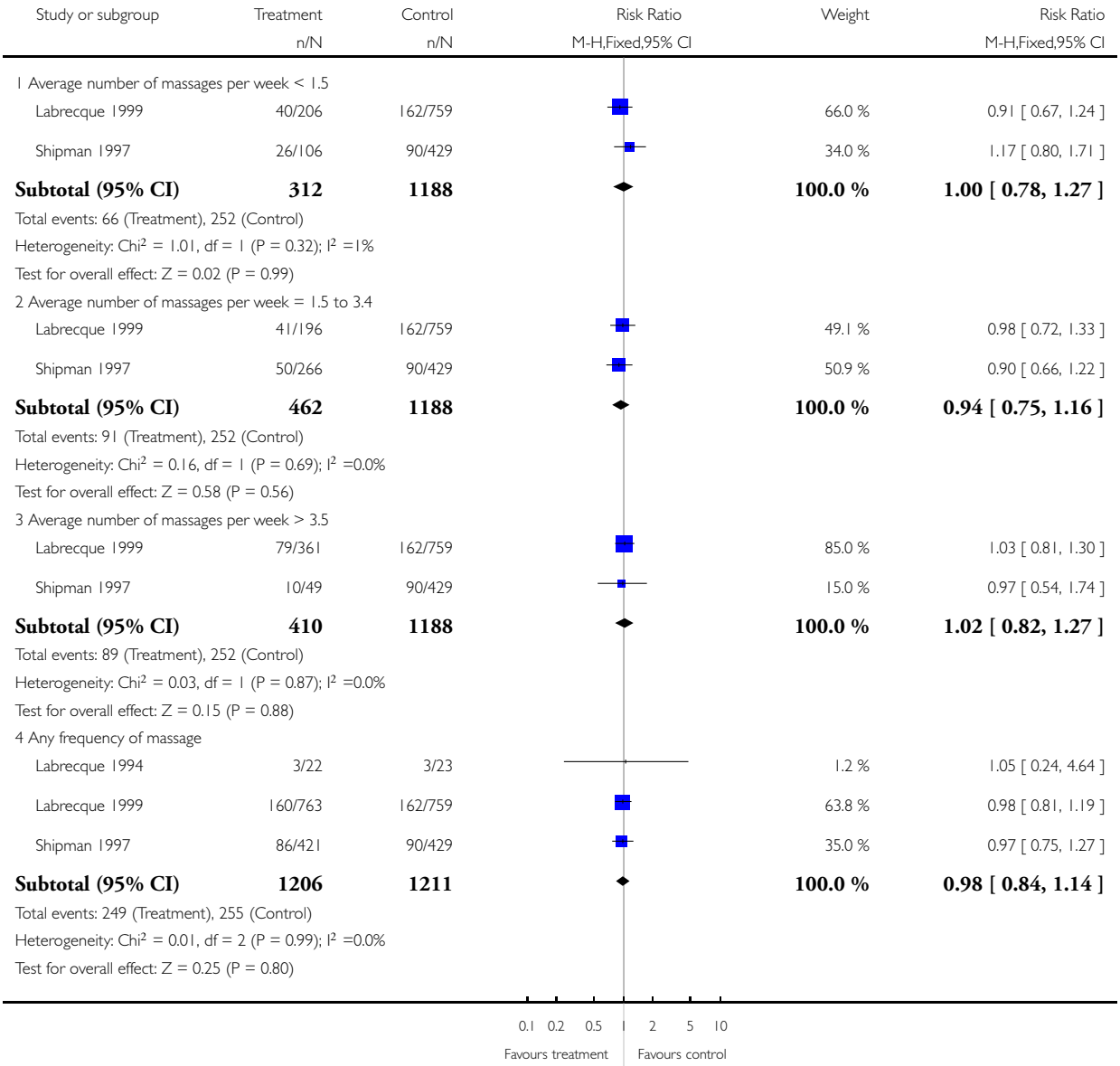


Analysis 2.3. Comparison 2 Digital perineal massage versus control: results by frequency of massage, Outcome 3 2nd degree perineal tear.

Review: Antenatal perineal massage for reducing perineal trauma

Comparison: 2 Digital perineal massage versus control: results by frequency of massage

Outcome: 3 2nd degree perineal tear

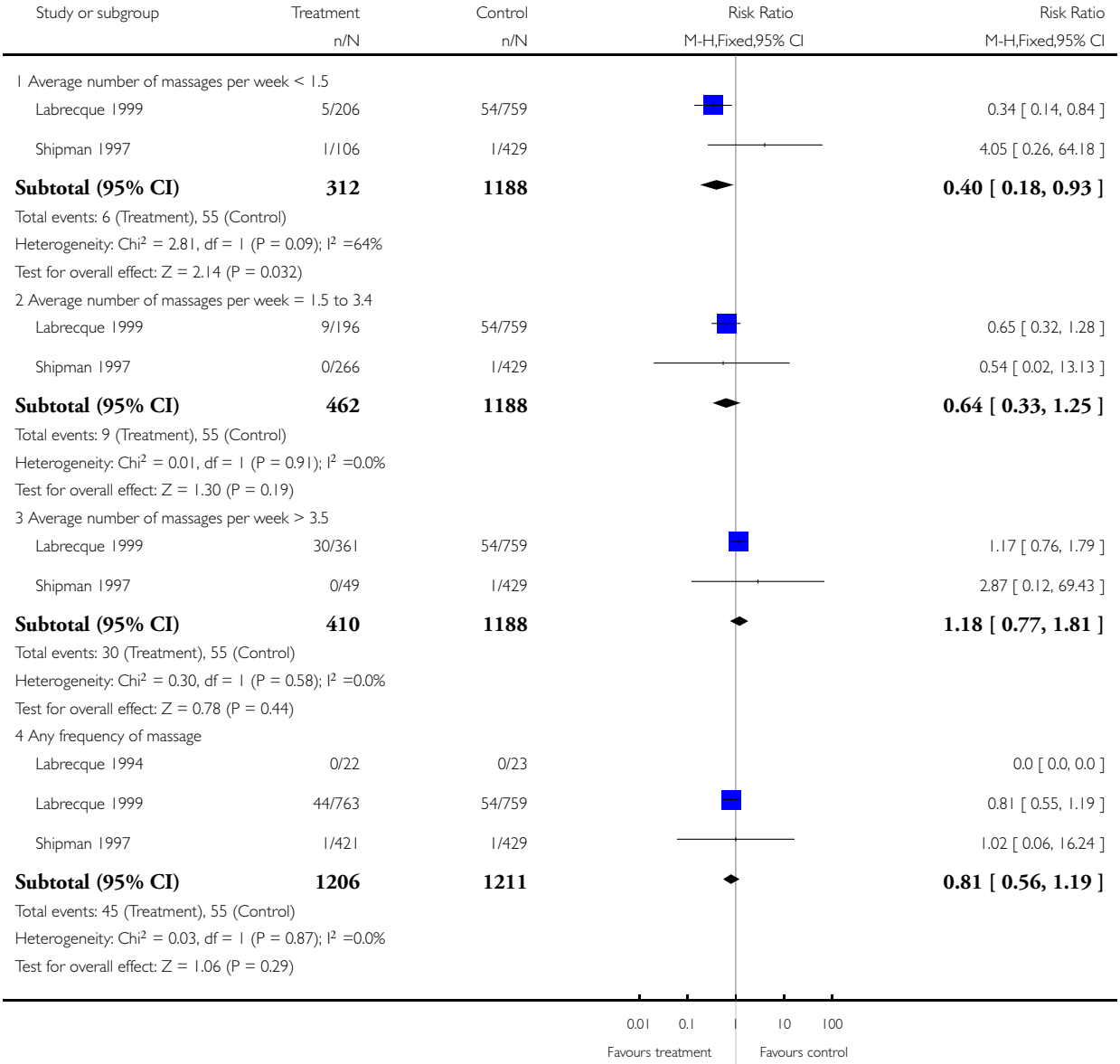


Analysis 2.4. Comparison 2 Digital perineal massage versus control: results by frequency of massage, Outcome 4 3rd or 4th degree perineal trauma.

Review: Antenatal perineal massage for reducing perineal trauma

Comparison: 2 Digital perineal massage versus control: results by frequency of massage

Outcome: 4 3rd or 4th degree perineal trauma

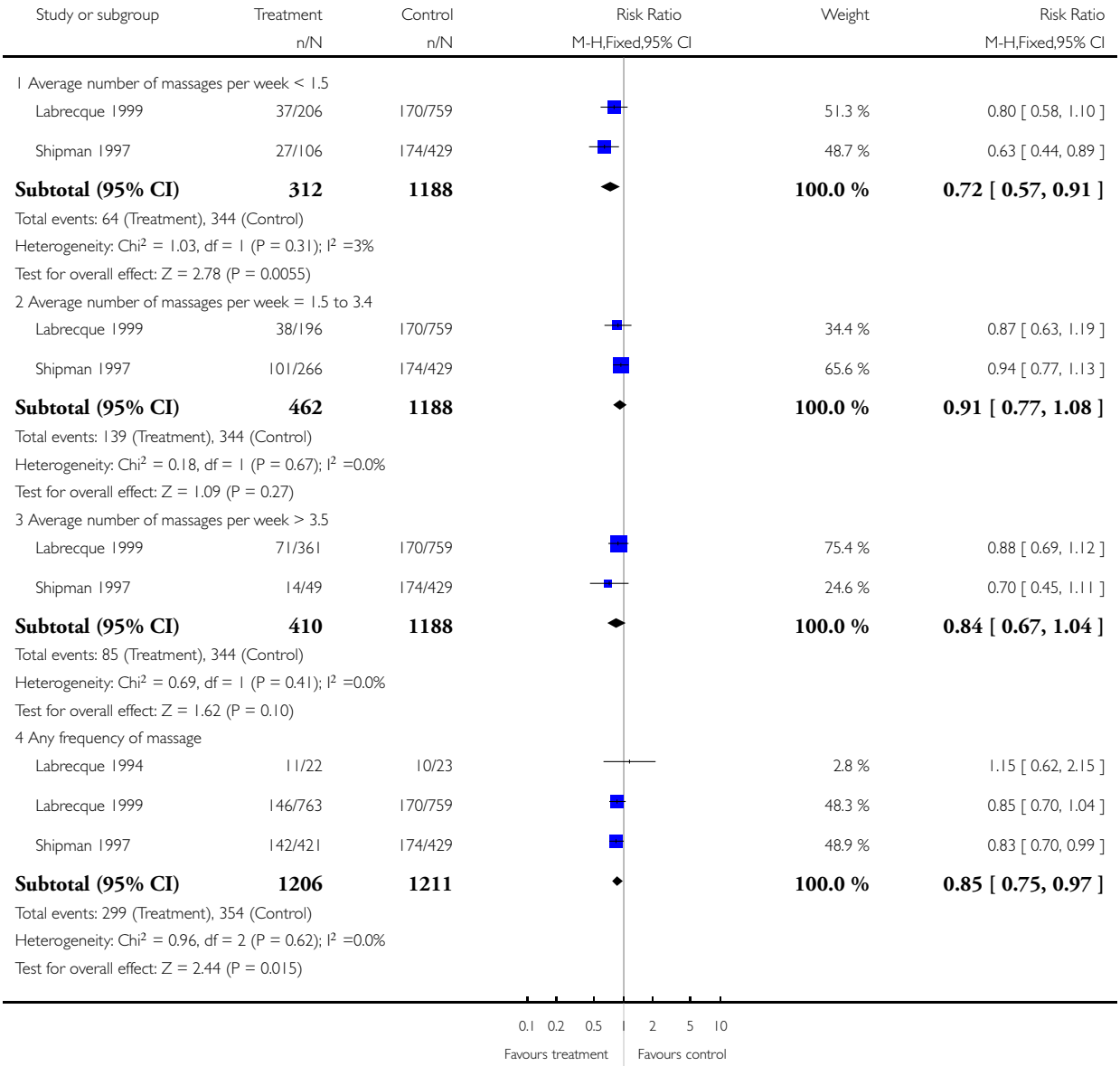


Analysis 2.5. Comparison 2 Digital perineal massage versus control: results by frequency of massage, Outcome 5 Incidence of episiotomy.

Review: Antenatal perineal massage for reducing perineal trauma

Comparison: 2 Digital perineal massage versus control: results by frequency of massage

Outcome: 5 Incidence of episiotomy



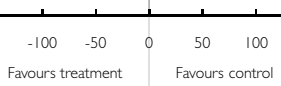
Analysis 2.6. Comparison 2 Digital perineal massage versus control: results by frequency of massage, Outcome 6 Length of second stage.

Review: Antenatal perineal massage for reducing perineal trauma

Comparison: 2 Digital perineal massage versus control: results by frequency of massage

Outcome: 6 Length of second stage

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Weight	Mean Difference IV,Fixed,95% CI
1 Average number of massages per week < 1.5							
Labrecque 1999	206	68.5 (57.4)	759	66.47 (52.24)		73.2 %	2.03 [-6.64, 10.70]
Shipman 1997	84	85.13 (60.19)	354	87.06 (60.88)		26.8 %	-1.93 [-16.28, 12.42]
Subtotal (95% CI)	**290**		**1113**			**100.0 %**	**0.97 [-6.45, 8.39]**
Heterogeneity: Chi² = 0.21, df = 1 (P = 0.64); I² =0.0%							
Test for overall effect: Z = 0.26 (P = 0.80)							
2 Average number of massages per week = 1.5 to 3.4							
Labrecque 1999	196	64.08 (50.76)	759	66.47 (52.24)		59.2 %	-2.39 [-10.41, 5.63]
Shipman 1997	216	84.7 (54.73)	354	87.06 (60.88)		40.8 %	-2.36 [-12.03, 7.31]
Subtotal (95% CI)	**412**		**1113**			**100.0 %**	**-2.38 [-8.55, 3.79]**
Heterogeneity: Chi² = 0.00, df = 1 (P = 1.00); I² =0.0%							
Test for overall effect: Z = 0.75 (P = 0.45)							
3 Average number of massages per week > 3.5							
Labrecque 1999	361	76.7 (58.97)	759	66.47 (52.24)		90.2 %	10.23 [3.10, 17.36]
Shipman 1997	35	103.17 (62.51)	354	87.06 (60.88)		9.8 %	16.11 [-5.55, 37.77]
Subtotal (95% CI)	**396**		**1113**			**100.0 %**	**10.80 [4.03, 17.58]**
Heterogeneity: Chi² = 0.26, df = 1 (P = 0.61); I² =0.0%							
Test for overall effect: Z = 3.13 (P = 0.0018)							
4 Any frequency of massage							
Labrecque 1999	763	71.24 (56.56)	759	66.47 (52.24)		72.2 %	4.77 [-0.70, 10.24]
Shipman 1997	335	86.74 (57.08)	354	87.06 (60.88)		27.8 %	-0.32 [-9.13, 8.49]
Subtotal (95% CI)	**1098**		**1113**			**100.0 %**	**3.35 [-1.29, 8.00]**
Heterogeneity: Chi² = 0.93, df = 1 (P = 0.34); I² =0.0%							
Test for overall effect: Z = 1.41 (P = 0.16)							
Test for subgroup differences: Chi² = 8.33, df = 3 (P = 0.04), I² =64%							

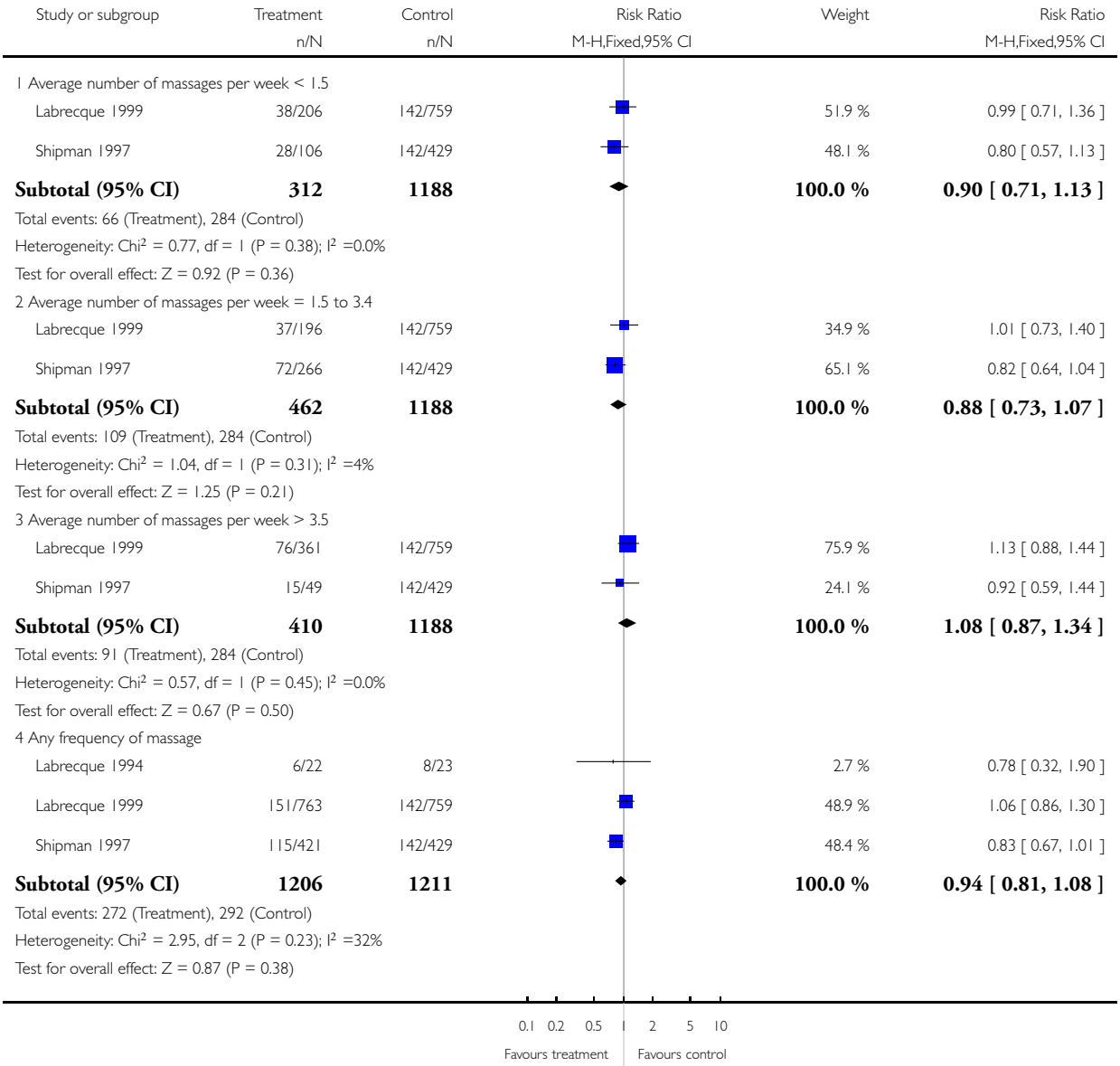


Analysis 2.7. Comparison 2 Digital perineal massage versus control: results by frequency of massage, Outcome 7 Instrumental delivery.

Review: Antenatal perineal massage for reducing perineal trauma

Comparison: 2 Digital perineal massage versus control: results by frequency of massage

Outcome: 7 Instrumental delivery

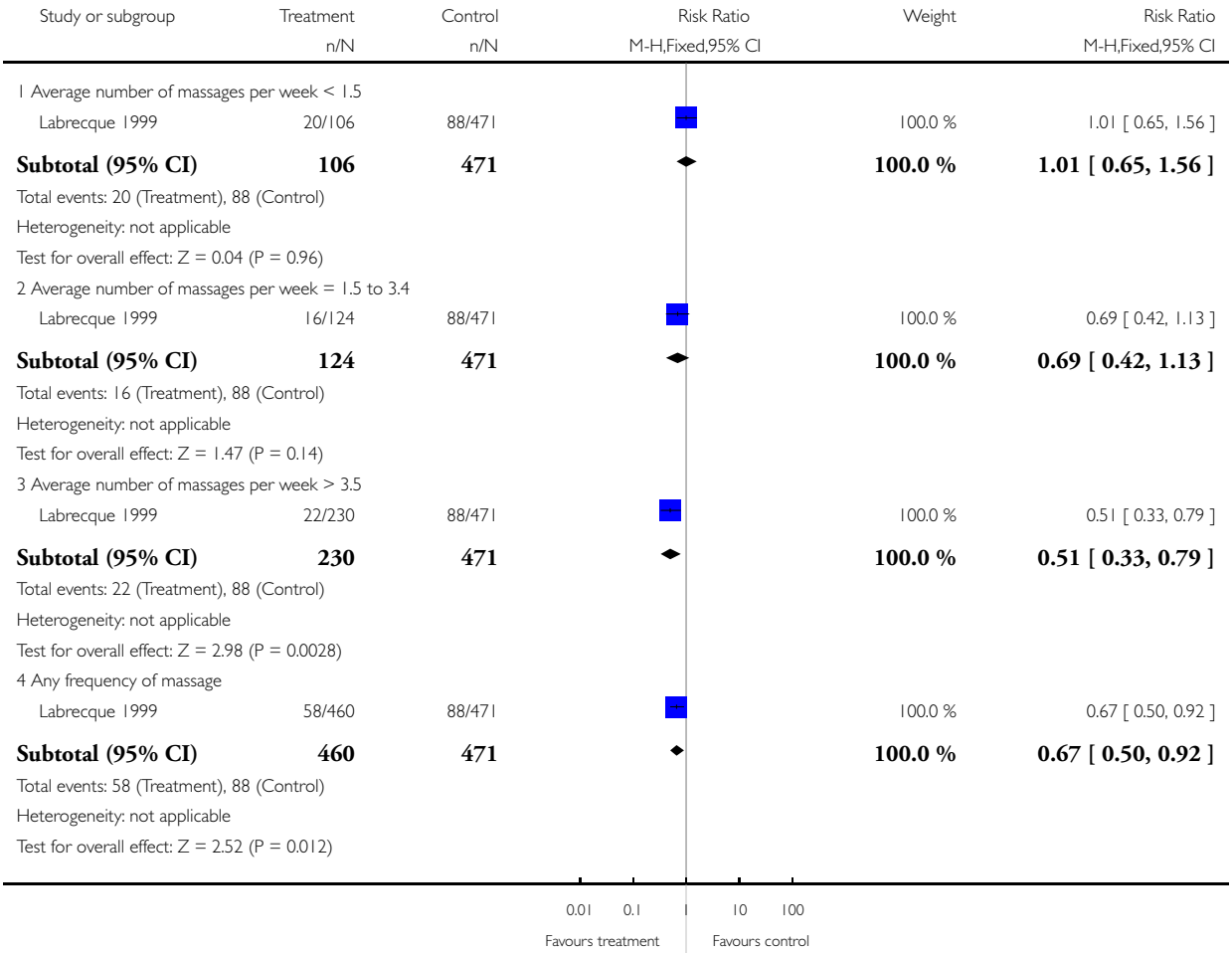


Analysis 2.13. Comparison 2 Digital perineal massage versus control: results by frequency of massage, Outcome 13 Perineal pain at 3 months postpartum.

Review: Antenatal perineal massage for reducing perineal trauma

Comparison: 2 Digital perineal massage versus control: results by frequency of massage

Outcome: 13 Perineal pain at 3 months postpartum

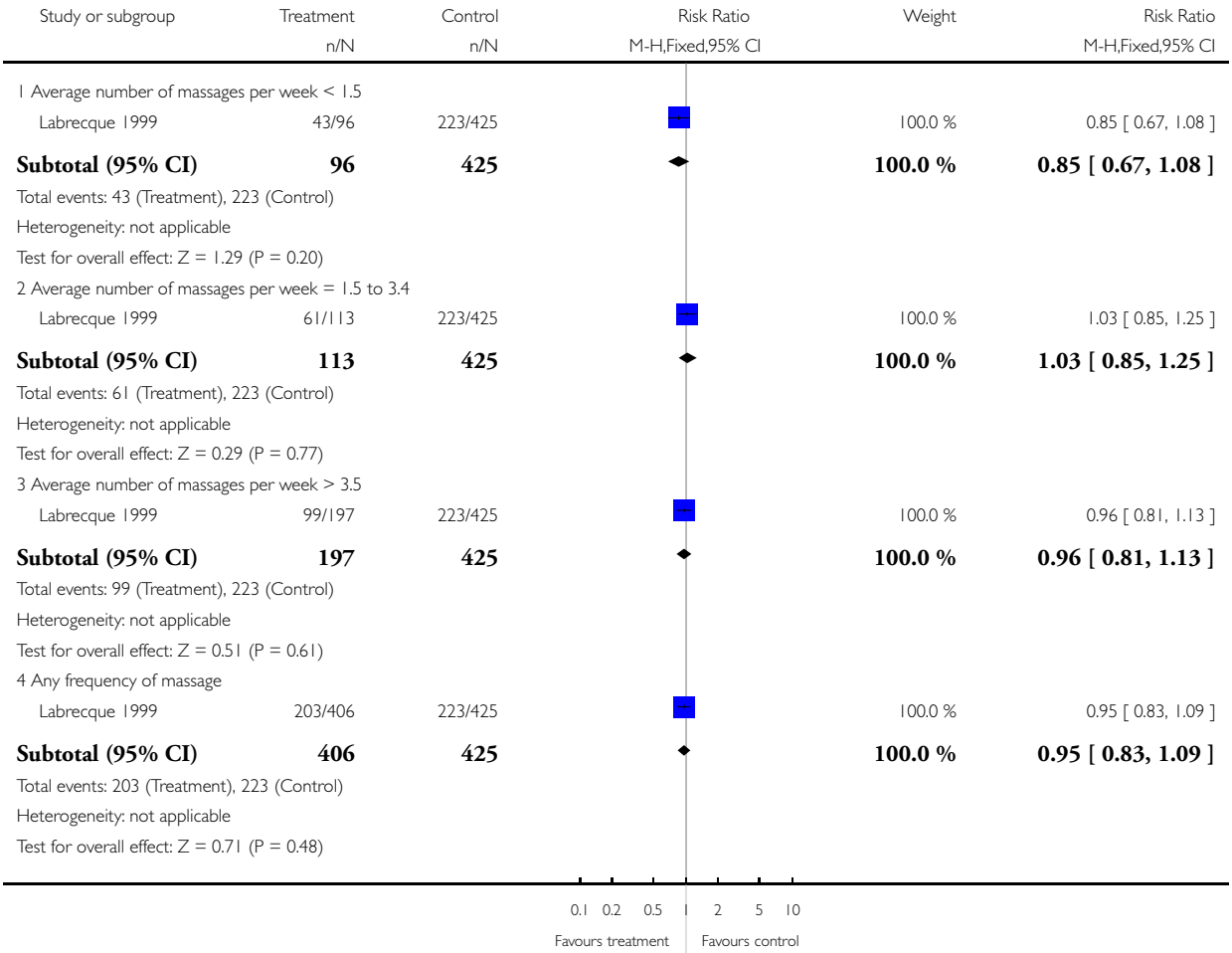


Analysis 2.14. Comparison 2 Digital perineal massage versus control: results by frequency of massage, Outcome 14 Painful sex at 3 months postpartum.

Review: Antenatal perineal massage for reducing perineal trauma

Comparison: 2 Digital perineal massage versus control: results by frequency of massage

Outcome: 14 Painful sex at 3 months postpartum

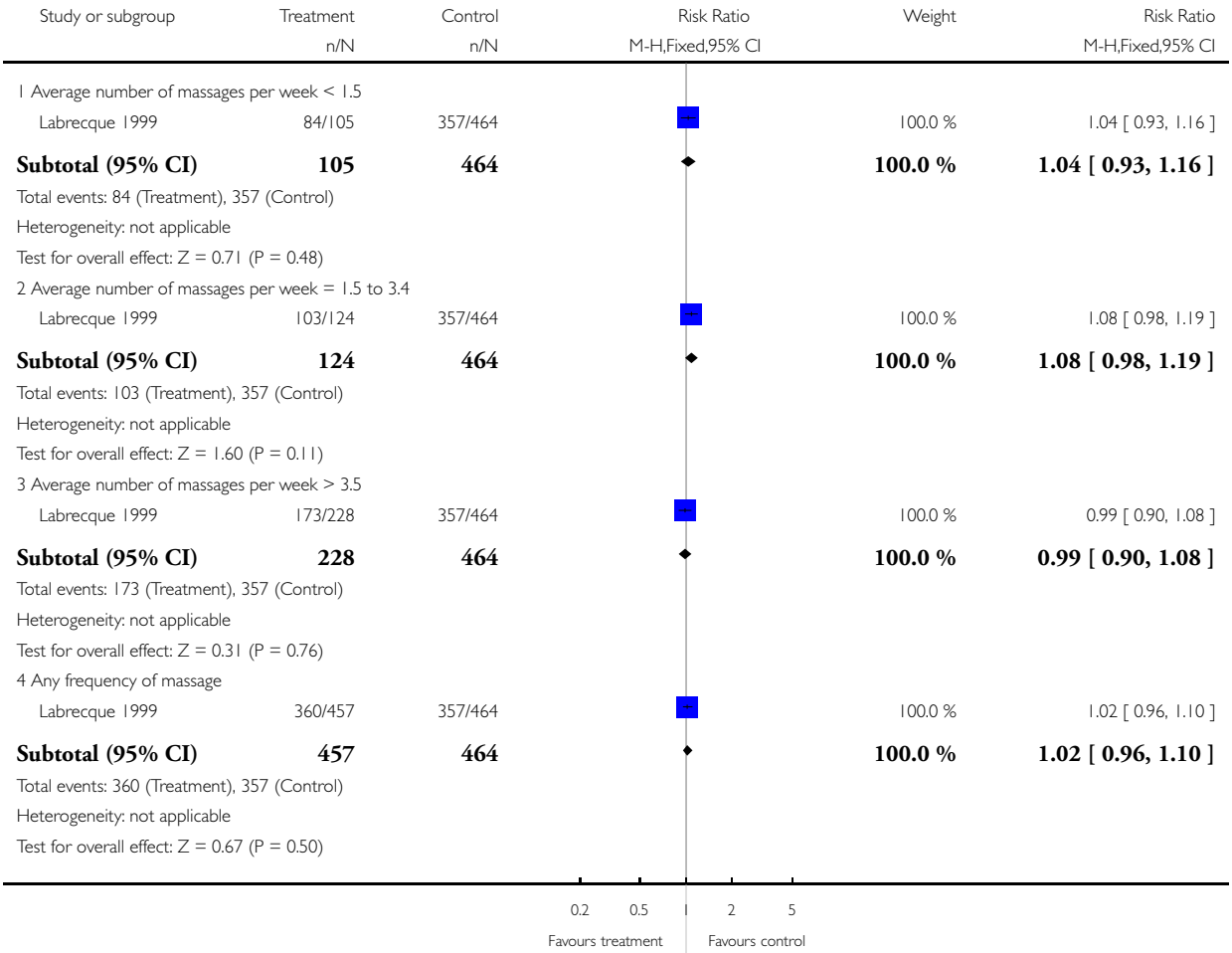


Analysis 2.15. Comparison 2 Digital perineal massage versus control: results by frequency of massage, Outcome 15 Woman's sexual satisfaction at 3 months postpartum.

Review: Antenatal perineal massage for reducing perineal trauma

Comparison: 2 Digital perineal massage versus control: results by frequency of massage

Outcome: 15 Woman's sexual satisfaction at 3 months postpartum



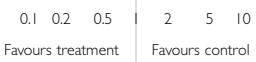
Analysis 2.16. Comparison 2 Digital perineal massage versus control: results by frequency of massage, Outcome 16 Partner's sexual satisfaction at 3 months postpartum.

Review: Antenatal perineal massage for reducing perineal trauma

Comparison: 2 Digital perineal massage versus control: results by frequency of massage

Outcome: 16 Partner's sexual satisfaction at 3 months postpartum

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Weight	Risk Ratio M-H,Fixed,95% CI
1 Average number of massages per week < 1.5					
Labrecque 1999	93/114	375/462		100.0 %	1.01 [0.91, 1.11]
Subtotal (95% CI)	**114**	**462**		**100.0 %**	**1.01 [0.91, 1.11]**
Total events: 93 (Treatment), 375 (Control)					
Heterogeneity: not applicable					
Test for overall effect: Z = 0.10 (P = 0.92)					
2 Average number of massages per week = 1.5 to 3.4					
Labrecque 1999	104/124	375/462		100.0 %	1.03 [0.95, 1.13]
Subtotal (95% CI)	**124**	**462**		**100.0 %**	**1.03 [0.95, 1.13]**
Total events: 104 (Treatment), 375 (Control)					
Heterogeneity: not applicable					
Test for overall effect: Z = 0.72 (P = 0.47)					
3 Average number of massages per week > 3.5					
Labrecque 1999	171/226	375/462		100.0 %	0.93 [0.86, 1.02]
Subtotal (95% CI)	**226**	**462**		**100.0 %**	**0.93 [0.86, 1.02]**
Total events: 171 (Treatment), 375 (Control)					
Heterogeneity: not applicable					
Test for overall effect: Z = 1.60 (P = 0.11)					
4 Any frequency of massage					
Labrecque 1999	358/454	375/462		100.0 %	0.97 [0.91, 1.04]
Subtotal (95% CI)	**454**	**462**		**100.0 %**	**0.97 [0.91, 1.04]**
Total events: 358 (Treatment), 375 (Control)					
Heterogeneity: not applicable					
Test for overall effect: Z = 0.87 (P = 0.38)					

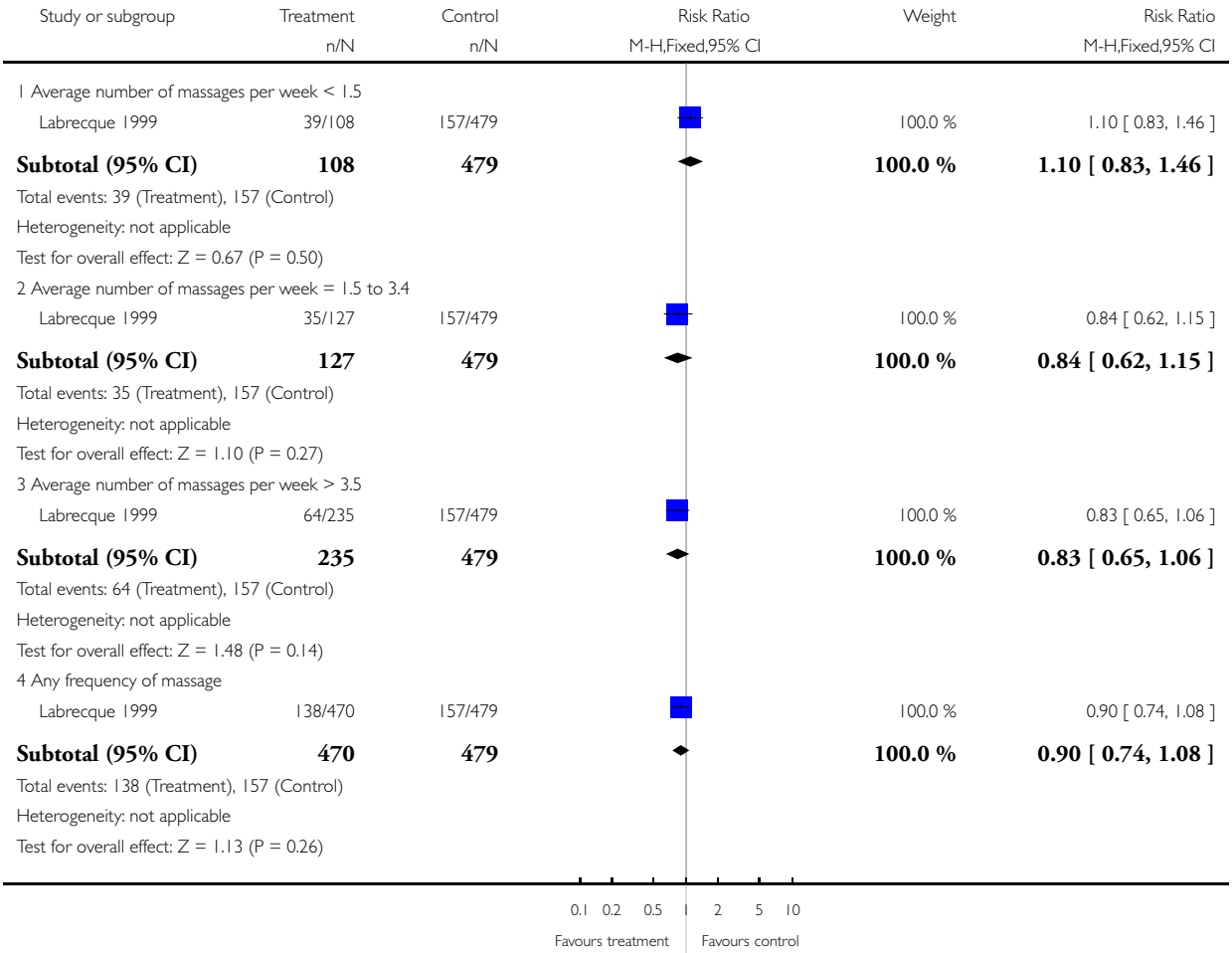


Analysis 2.17. Comparison 2 Digital perineal massage versus control: results by frequency of massage, Outcome 17 Uncontrolled loss of urine at 3 months postpartum.

Review: Antenatal perineal massage for reducing perineal trauma

Comparison: 2 Digital perineal massage versus control: results by frequency of massage

Outcome: 17 Uncontrolled loss of urine at 3 months postpartum

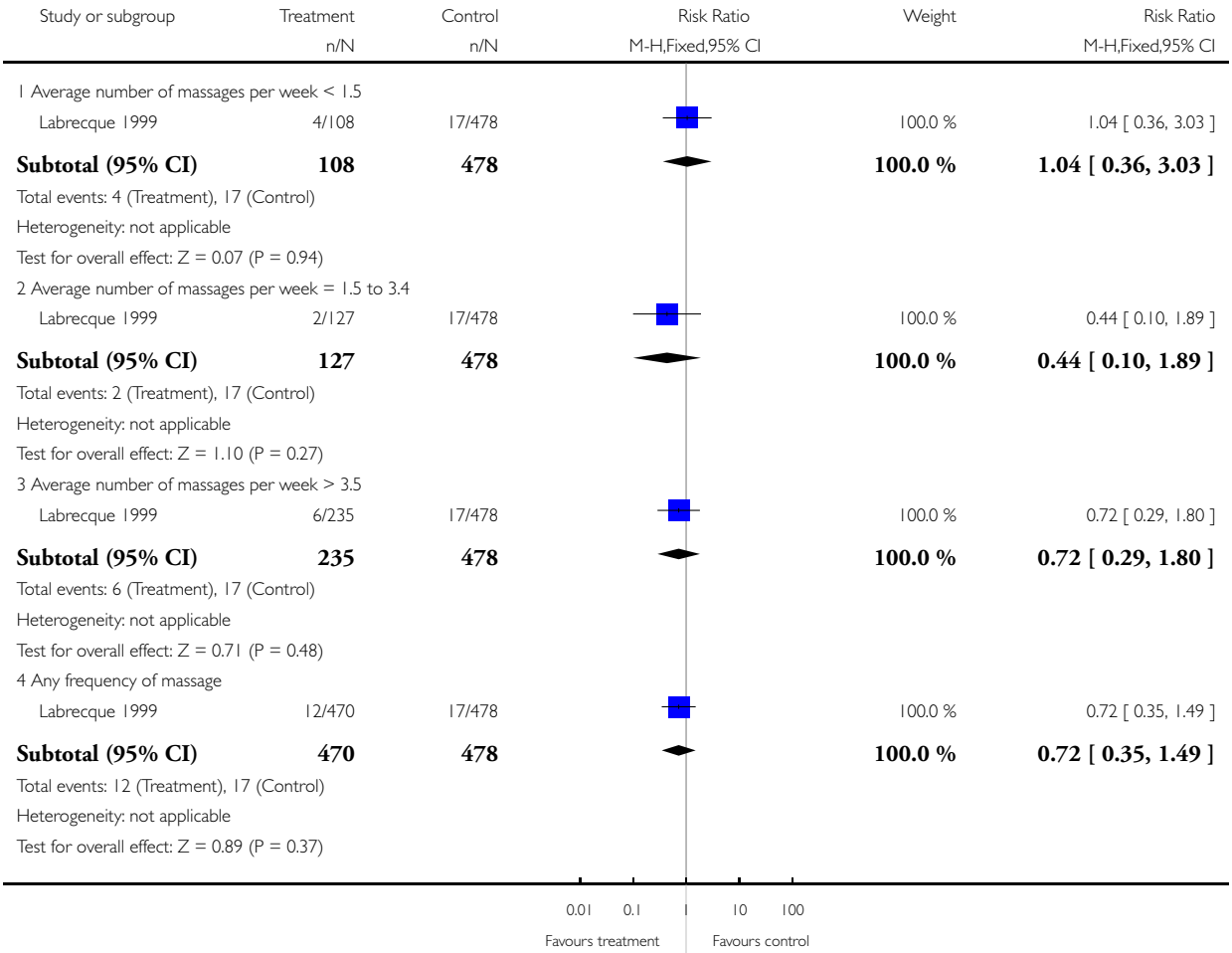


Analysis 2.18. Comparison 2 Digital perineal massage versus control: results by frequency of massage, Outcome 18 Uncontrolled loss of faeces at 3 months postpartum.

Review: Antenatal perineal massage for reducing perineal trauma

Comparison: 2 Digital perineal massage versus control: results by frequency of massage

Outcome: 18 Uncontrolled loss of faeces at 3 months postpartum

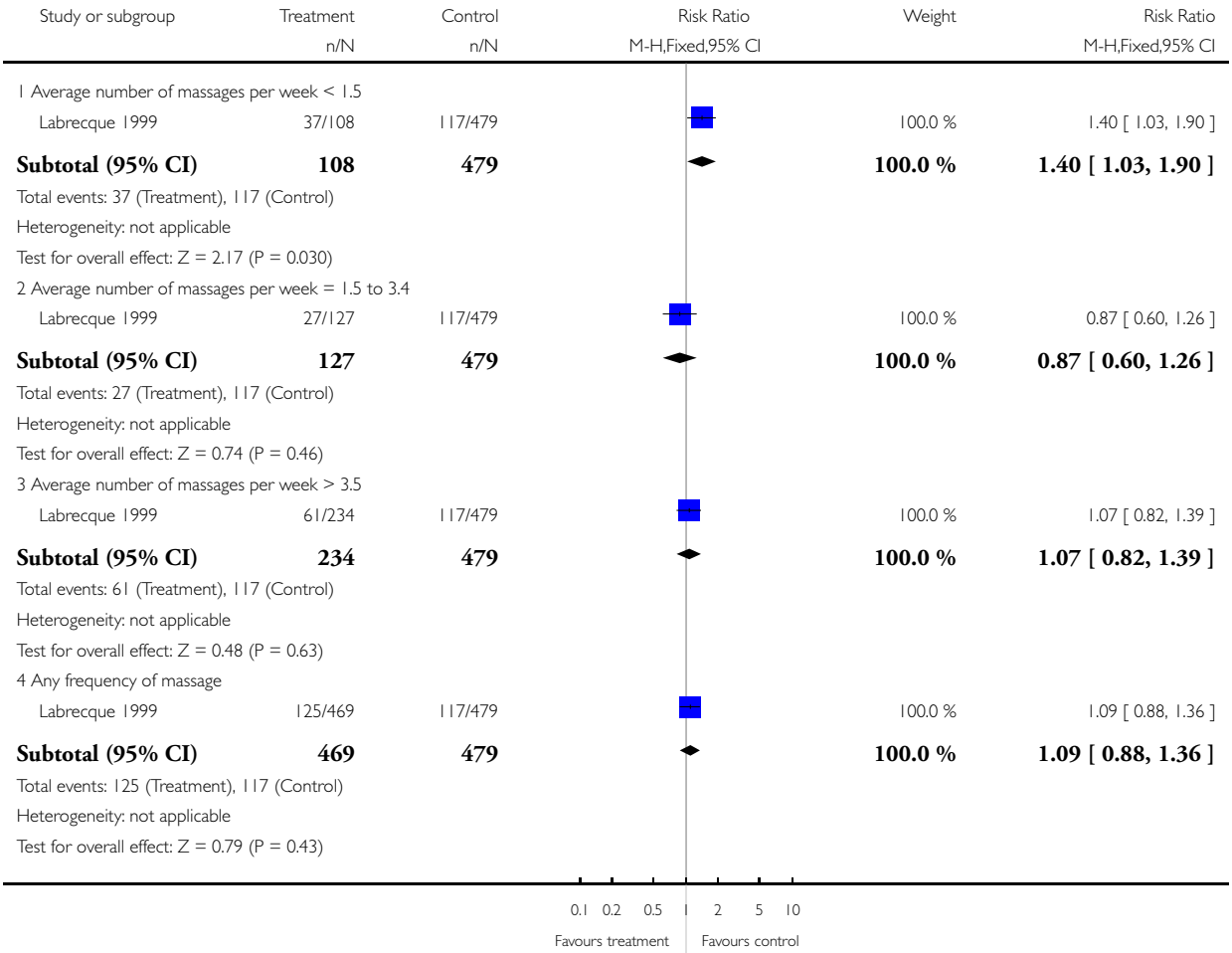


Analysis 2.19. Comparison 2 Digital perineal massage versus control: results by frequency of massage, Outcome 19 Uncontrolled loss of flatus at 3 months postpartum.

Review: Antenatal perineal massage for reducing perineal trauma

Comparison: 2 Digital perineal massage versus control: results by frequency of massage

Outcome: 19 Uncontrolled loss of flatus at 3 months postpartum



ADDITIONAL TABLES

Table 1. Flatal incontinence at 3 months postpartum in women who massage less than 1.5 times per week

	Treatment		Control		Risk ratio, M-H, Fixed, 95% CI
	Events	Total	Events	Total	
Reporting of infrequent flatal incontinence	21	108	107	479	0.87 (0.57,1.32)
Reporting of flatal incontinence at least daily	6	108	10	479	2.66 (0.99,7.16)

Table 2. Length of second stage perineal massage versus control: analysis excluding episiotomies

Duration	All women	Excl episiotomy
Length of 2nd stage (mins)	+3.84 (95% CI -0.26 to +7.95)	+3.57 (95% CI -0.86 to +8.00)
Length of 2nd stage for women massaging more than 3.5 times/week (mins)	+10.80 (95% CI +4.03 to +17.58)	+5.21 (95% CI -1.45 to +11.86)

mins: minutes
CI: confidence interval

APPENDICES

Appendix 1. Search strategy

CENTRAL (*The Cochrane Library* 2008, Issue 2), PubMed (1966 to June 2008) and EMBASE (1980 to June 2008) adapted for each database by selecting appropriate subject headings and/or free text terms.
#1 PERINEUM (MeSH)
#2 perine*
#3 MASSAGE (MeSH)
#4 massag*
#5 EPISIOTOMY (MeSH)
#6 episiotom*
#7 LACERATION (MeSH)
#8 lacerat*
#9 #1 or #2
#10 #3 or #4
#11 #5 or #6
#12 #7 or #8
#13 #9 and #10

#14 #11 and #10
#15 #12 and #10
#16 #13 or #14 or #15

WHAT'S NEW

Last assessed as up-to-date: 29 June 2008.

Date	Event	Description
12 July 2008	New search has been performed	A new search found two studies (Shimada 2005; Mei-Dan 2004); only one has been included (Shimada 2005). The meta-analysis has been updated. Results and conclusions are unchanged

HISTORY

Protocol first published: Issue 1, 2005

Review first published: Issue 1, 2006

Date	Event	Description
9 June 2008	Amended	Converted to new review format.

CONTRIBUTIONS OF AUTHORS

Michael Beckmann and Andrea Garrett worked collaboratively on the development of the protocol. Andrea Garrett undertook selection of trials for inclusion, quality assessment and data extraction and commented on drafts of review. Michael Beckmann undertook data search, selection of trials for inclusion, quality assessment and data extraction, statistical analysis and interpretation, and writing of the review. The updated review was undertaken by Michael Beckmann.

DECLARATIONS OF INTEREST

None known.

SOURCES OF SUPPORT

Internal sources

- No sources of support supplied

External sources

- Australian Department of Health and Ageing, Australia.

INDEX TERMS

Medical Subject Headings (MeSH)

Delivery, Obstetric [*adverse effects]; Massage [*methods]; Obstetric Labor Complications [*prevention & control]; Perineum [*injuries]; Prenatal Care [*methods]; Randomized Controlled Trials as Topic

MeSH check words

Female; Humans; Pregnancy