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The side effects and mother or child related physical harm from massage during pregnancy and the postpartum period: An observational study

Sarah Fogarty[a,*], Catherine McInerney[b], Cath Stuart[c], Phillipa Hay[a]

[a] Western Sydney University, School of Medicine, Locked Bag 1797, Penrith, NSW 2751, Australia
[b] Pregnancy Massage Australia, PO Box 86, Bright, VIC 3741, Australia
[c] 244 Illawarra Rd, Marrickville, NSW 2204, Australia

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ABSTRACT

Introduction: Women commonly use massage therapy during pregnancy for pregnancy-related health conditions such as lower back and neck pain; however, there is little to no research related evidence on the side effects or mother or child physical harm of massage during pregnancy and the postnatal period.
Objectives: This study aims to report on the side effects and mother or child physical harm of massage during pregnancy and the postnatal period.
Design: An observational study methodology.
Setting and time frame: Two massage clinics, one in Sydney and one in Melbourne recruited participants from December 2016 to December 2017.
Intervention: Massage.
Main outcome measure: Side effects and mother or child physical harm from massage.
Results: One hundred and one participants were recruited to the study. Two fifths of the participants (n = 32, 40%) experienced one of more post-massage side effects. There were no mother or child physical harm events. Low back pain was the most common condition women sought massage treatment for 34 (33.7.%). A significant benefit ($p < 0.001$) was seen pre-massage to post-massage and pre-massage to 1-week post massage in decreasing stress, decreasing pain, increasing range of motion and improving sleep
Discussion: Similar to previous research, low back pain was the most common condition that women sought massage treatment for followed by hip pain, shoulder pain, neck pain and to improve mental health. Ninety-seven percent of the cohort received a full body massage including the feet leading credence that 'massage on the feet during pregnancy is harmful' is mythic in nature.
Conclusion: While our findings lead credence that massage on the feet during pregnancy is a myth the study was not powered to determine the safety of pregnancy massage and further research is needed. Massage was commonly sought for low back pain with promising benefits in decreased pain and improved range of movement and further research on the effectiveness of massage for low back pain in pregnancy.

1. Introduction

During pregnancy, women can experience new health issues or exacerbation of previous or current health issues such as musculoskeletal, neurological and or psychological problems.[1–7] Common health issues experienced by Australian women during pregnancy are back, neck or pelvic pain,[8,9] stress, depression and or anxiety,[1,4] sleep disturbances and or headaches.[2–4] Their prevalence during pregnancy is high with 39.5% of Australian women experiencing back pain, 12.4% experiencing neck pain and 16.3% experiencing pelvic pain[4] and anxiety ranging from 2.6% to 39%.[10] These health problems have been associated with adverse pregnancy outcomes such as preterm birth, developing gestational diabetes or pre-eclampsia and cesarean deliveries.[5–7] However, seeking treatment for these pregnancy-related health issues can be difficult as previous pharmacological interventions may not be available due to safety concerns associated with pregnancy. In addition there is an insufficiency of data available to guide evidence-based decisions for both pharmacological and complementary therapy based treatments.[4,8,9] Not all individuals seek treatment for their pregnancy-related health issues and the reasons for this are not known, it has been speculated that pain is a 'normal' part of pregnancy and therefore some women don't seek treatment and that financial constraint may be a

* Corresponding author at: PO Box 8218, Ferntree Gully, VIC, 3156, Australia.
E-mail address: s.fogarty@westernsydney.edu.au (S. Fogarty).

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factor in not seeking treatment with women without health insurance being less likely to seek treatment.[4] The lack of treatment and insufficiency of data with which to make health-related decisions during pregnancy can potentially endanger both the mother and the child and more evidence about non-pharmacological treatment options to reduce or manage pregnancy-related health issues (either new or pre-existing) is needed.

Safety is defined by the World Health Organisation as "the prevention of errors and adverse effects to patients associated with health care".[11] Massage is a popular treatment option to manage pregnancy-related health issues with almost half (49.5%) of all complementary therapies visits during pregnancy being for massage, in particular using massage for back pain (32.3%) and neck pain (39.9%) is common.[4,12,13] However, there is little to no research related evidence on the side effects and mother or child related physical harm of massage during pregnancy and the postnatal period. Despite there being anecdotal and clinical evidence that massage is physically safe for mother and child during pregnancy when administered by a trained professional[14–16] there are many myths, "old wives tales", uninformed opinions, and personal preferences surrounding massage during pregnancy and the postpartum period such as not massaging certain areas of the body or massaging during certain trimesters due to the risk of physical harm to the unborn child especially miscarriage, pre-term birth,[17–19] despite evidence that massage may decrease prematurity.[20,21] This can cause fear, anxiety and or stress for women who are contemplating or have undergone massage treatment during this time period. Given that massage is a popular treatment and there is no robust research evidence on the side effects and mother or child related physical related from massage during pregnancy and the postpartum period which may assist women to make an informed decision about their health care needs and provider, this clinical cohort study aimed to report the side effects and mother or child related physical harm from massage during pregnancy and the postnatal period using an observational study methodology.

2. Materials and methods

2.1. Method

The study is a prospective observational study in a convenience sample of pregnant women who choose to use massage therapy during their pregnancy.

2.2. Location

Two massage therapy clinics in Australia, one in Sydney and one in Melbourne.

2.3. Time frame for collecting patient data

Data were collected over a 12-month period (Dec 2016 to Dec 2017). The data collection was prospective. Data collection was intermittent as not all pregnant or postnatal women consented to participate in the study.

2.4. Ethics

All participants provided informed consent prior to their inclusion in the study. Ethics approval was obtained from Human Research Ethics Committee of Western Sydney University. The ethics approval number is H11819.

2.5. Recruitment

Potential participants were any pregnant or postnatal clients booked in for a massage with practitioners at the two clinics. The massage therapists asked eligible clients if they were interested in participating in the study. It was emphasised to all potential subjects that participation in the study was voluntary and their care would not be affected if they decided not to participate. The massage therapists (n = 2) recruited and obtained consent from the clients wishing to participate.

2.5.1. Massage therapist characteristics

All massage therapists involved in the study had seen over 700 pregnant clients, worked in a practice that focused on pregnancy and postnatal massage and had undertaken post graduate training in pregnancy and postnatal massage. All massage therapists were all members of Australian Massage Associations and were eligible for listing and reimbursement with the Australian health insurance companies covering massage.

2.5.1.1. Inclusion criteria. The inclusion criteria for participation included pregnant or postnatal woman (postnatal being up to six months post giving birth), aged ≥18 years, able to communicate in English and having a massage during their pregnancy or their postnatal period with one of the two massage therapists.

2.5.1.2. Exclusion criteria. Unwilling to provide post massage information, unable to speak or read English and not receiving any massage treatment.

2.5.1.3. Intervention. All participants received a massage at the practitioner's clinic. Usual care included providing a pregnancy or postnatal massage for the time frame the patient booked in for. The massage provided was to involve Swedish massage techniques with massage strokes used including longitudinal gliding, transverse gliding, digital ischemic pressure, transverse frictions and transverse gliding.

2.5.1.4. Questionnaire. The questionnaire was developed by the research team to collect information on massage side effects and physical pregnancy/maternal events. Massage side effects are possible 'expected' events that are temporary and associated with receiving a massage.[22,23] The symptoms used to determine side effects related to massage therapy are based on common side effects reported from previous massage and safety research in a non pregnant population[24–27] and include post massage soreness, bruising, skin reactions, increased pain, exacerbation of symptoms, headaches, dizziness, tiredness or fatigue, post treatment muscle soreness, unsettled digestion, none and or other (please list). The events used to determine unexpected mother or child related physical harm were based on previous research on main pregnancy complications,[28] data from the Australian Institute of Health and Welfare Mothers and Babies reports[29] and the concerns raised specifically in relation to massage during pregnancy on the internet.[17,18] The questionnaire therefore asked questions to determine if any 'unexpected' physical pregnancy/maternal events occurred such as bleeding, hypertension, pre-eclampsia, pre-term delivery or premature rupture of the membranes.

See Appendix 1 for a copy of the 1-week post-massage questionnaire.

2.6. Outcomes

2.6.1. Timing

The outcome data was collected pre and post massage and at one-week post massage. The massage therapist collected the pre and post massage data and the study investigators (SF) collected the one-week follow-up data.

2.6.2. Data collected

2.6.2.1. Client intake forms. Included information about participants past history, previous pregnancies, current pregnancy, health and reason for visit, collected pre-treatment by the massage therapists.

2.6.2.2. Effect of massage on commonly reported conditions. Information was collected on their response to treatment in regards to pain, stress, range of movement and sleep as these are commonly reported benefits of massage.[22–26] This was completed by the participant pre and post massage and one-week post massage. Visual Analog Scales (VAS) were used to collect levels of pain, stress, range of movement and quality of sleep. The scales ranging from 0 to 100, pain was no pain to pain at its worst, stress was none to as bad as it could be, restriction was no restriction to restriction as bad as it could be and sleep was more restful than usual to more restless than usual.

2.6.2.3. Massage side effects. The one-week follow up questionnaire, collected by the study researcher (SF), included information on massage side effects.

2.6.2.4. Mother or child related physical harm. The one-week follow up questionnaire, collected by the study researcher (SF), included information on mother or child physical related events.

2.7. Analysis

Demographic characteristics are analysed descriptively to describe the diversity and population of people participating in the study. This includes describing the population researched including their average age (mean and standard deviation (SD)), the number of times they have been pregnant (mean), previous history of pregnancy massage (mean and percentage) and any complications (mean and SD). A summary was produced that indicates the major presenting problems (frequency (count and percentage)), duration of massage and the type of massage treatment itself e.g. full body (frequency (count and percentage))

Data from the 1-week follow-up were analysed as a whole and also by trimester. The trimesters are defined by development thus the first trimester will be weeks 0–11 weeks plus six days (0–11 + 6), second trimester 12 to 26 + 6 and the third trimester weeks 27 to 41 + weeks. The pre and post massage outcomes (e.g. stress, pain, sleep etc.) are reported as mean scores with standard deviations. A *t*-test was used to determine significant differences between pre and post massage scores, pre massage and 1-wek post massage score and post massage to 1-week post massage scores. The data from the 1-week follow-up regarding side effects and mother or child related physical harm were analysed as incidences e.g. post massage soreness, etc. and reported as a count and a percentage.

The study was not powered to determine the safety of massage in relation to mother or child related physical harm given it is so rare but the purpose was to describe and report on any mother or child related physical harm observed in the cohort.

3. Results

3.1. Recruitment

One hundred and one study participants were recruited from two massage therapy clinics in Australia, one in Sydney and one in Melbourne over a 12-month period from December 2016 to December 2017. An attempt was made to track how many women were approached and how many participated; however, the recording of this was not consistent and thus it has not been reported.

3.1.1. Participant characteristics

The cohort, on average, presented with a mean age of 34.1 (± 4.0) in the third trimester (n = 65 64.4%), having a singleton (n = 100 99%), nullpara (no previous pregnancies reaching gestational age) (n = 46 (45.55) and were married/engaged (n = 87 86.1%). Slightly greater than half the participants (n = 56 55.4%) had experienced pregnancy massage previously and a just over one in four experienced a previous pregnancy loss. See Table 1.

Table 1
Participant demographics (n = 101).

	Mean (SD)
Age	34.10 (4.0)
	n (%)
Trimester in at time of massage	5 (4.9%)
• First trimester	27 (26.8%)
• Second trimester	65 (64.4%)
• Third trimester	4 (3.9%)
• Postnatal	
Having a singleton	100 (99%)
Marital status	87 (86.1%)
Married/Engaged	12 (11.9%)
Partner	2 (2.0%)
Defacto	
Gravida (number of times been pregnant)	40 (39.6%)
Gravida 1	29 (28.7%)
Gravida 2	17 (16.8%)
Gravida 3	9 (8.9%)
Gravida 4	6 (5.9%)
Gravida 5 and greater	
Parity (number of pregnancies reaching viable gestational age)	46 (45.5%)
Nullpara (none)	36 (35.6%)
Para 1	15 (15.6%)
Para2	3 (3.0%)
Para 3	1 (1%)
Para 4	
Number who had suffered a previous loss (type of loss unknown)	28 (27.7%)
No previous experience of pregnancy massage	45 (43.6%)
Previous experience of pregnancy massage	56 (55.4%)

The cohort presented as generally physically healthy but over half were suffering from lower back pain and just over 1 in 3 had experienced leg cramps and or hip pain. The cohort, on average, was also generally emotionally healthy with worry about the pregnancy and or birth as the top concern followed closely by current or previous anxiety. Three participants did not answer questions about their physical health (2.97%) and four about their emotional health (3.96%). See Table 2 from more detailed information on the physical/emotional attributes of the cohort.

3.1.2. Treatment characteristics

3.1.2.1. Number of treatments. One hundred and one participants had 166 treatments with 29 people seeking more than one treatment (14 people had 2 treatments, 5 people had 3 treatment, 5 people had 4 treatments, 2 people had 5 treatments, 2 people had 6 treatments and one person had nine treatments).

3.1.2.2. Presenting complaint. The main presenting compliant that the cohort wanted addressed by the massage was lower back pain (33.7%), hip pain (23.8%), shoulder pain (20.8%) and pelvic pain (18.8%). See Table 3 for more detailed information.

3.1.2.3. Treatment length. The length of the treatment for the 101 individual participants was 60 min for 42 participants (41.6%), 75 min for 54 participants (53.5%) and 90 min for 5 participants (5.0%). For those that had repeat visits the majority were 60-minute sessions (n = 47) with a smaller number of 75-min sessions (n = 18).

3.1.2.4. Areas massaged. The majority of treatments (n = 98, 97%) involved a full body massage (back, gluteals, neck, arms, hands, leg and feet) with a focus on the areas that the participant sought massage treatment for and three treatments (3%) involved receiving a massage just on the problem areas. The majority of the repeat visits were full body massages (n = 58) with five treating the problem area only and two being labour preparation massages.

Treating the abdomen was not included as part of the full body massage and the abdomen was included in treatment in 51 of the treatments (50.5%), 17 did not have their abdomen massaged (168%)

Table 2
Physical and emotional conditions suffered from (n = 101).

	n (%)
Physical conditions suffered	
Low back pain	61 (60.4%)
Leg cramps	40 (39.6%)
Hip pain	38 (37.6%)
Sciatica/gluteal pain	33 (32.7%)
Headaches	29 (28.7%)
Pain/Numbness	20 (19.8%)
Nausea	20 (19.8%)
Separation of abdominal muscles	18 (17.8%)
Allergies/skin problems	17 (16.8%)
Oedema/swelling/Surgery	15 (14.9%)
Varicose Veins	12 (11.9%)
Separation of symphisis pubis	9 (8.9%)
Carpal tunnel	8 (7.9%)
Injuries	6 (5.9%)
Abdominal cramping	5 (5.0%)
More than 2 consecutive miscarriage	4 (4.0%)
Illness/ Preterm labour	2 (2.0%)
Other (Spinal disorders/ Osteoporosis/Arthritis/ High blood pressure/ Diabetes/ Chronic hypertension/ Placenta insufficiency)	7 (6.9%)
Emotional conditions	
Current or Previous Eating Disorder	3 (3.0%) *
Current or previous anxiety	26 (25.7%)
Current or previous depression	19 (18.8%)
Previous postnatal depression	2 (2%)
Worry about pregnancy and or birth	29 (28.7%)
Worry about pregnancy weight gain	18 (17.8%)
Worry about changing body shape	15 (14.9%)
Worry about losing weight post pregnancy	22 (21.8%)

* 2 with Bulimia Nervosa and 1 with Anorexia Nervosa.

Table 3
Area/s seeking treatment for* (symptoms complaining of) (n = 101).

Issue/Condition	n (%)
Back area	
Lover back/Lumbar pain/stiffness	34 (33.7.%)
Shoulder pain/stiffness	21 (20.8%)
Thoracic/mid back pain/stiffness	11 (10.9%)
Back pain (general, area not specified)	5 (5.0%)
Head and Neck area	
Neck pain/stiffness	18 (17.8%)
Headaches	3 (3.0%)
Hip/Pelvis Area	
Hip pain	24 (23.8%)
Pelvic pain/pubic symphysis issues	19 (18.8%)
Sciatica/gluteal pain	9 (8.9%)
SIJ pain	8 (7.9%)
Groin pain	2 (2.0%)
Chest area	
Chest/rib pain or sore breasts	7 (6.9%)
Leg or arm areas	
Leg cramps/Calf pain	11 (11.9%)
Oedema/swelling	7 (6.9%)
Carpal tunnel	7 (6.9%)
Leg pain or restless legs/ Plantar Fasciitis	2 (2.0%)
Relaxation	
Stress/anxiety	8 (7.9%)
Relaxation/general wellbeing	6 (5.9%)
Tiredness	2 (2.0%)
Other	
Nausea/Vertigo	4 (4.0%)

* More than one reason for seeking treatment could be given.

and in 33 cases it was not stated (32.87%).

In repeat visits the abdomen was massaged, not massaged and not stated almost equally (n = 20, 20 and 21 respectively).

3.1.2.5. Massage techniques. The client history and treatment records for the individuals showed that the massage provided was Swedish massage with techniques used including gliding (both longitudinal and transverse), kneading, cross frictional work (transverse frictions), static holds (digital ischemic pressure) and muscle stretching.

No other modality of treatment was used such as herbs, naturopathy or acupuncture in any of the massage treatments including the repeat visits.

Table 4
Side effects by individual (n = 80).

	Adverse Events	
No side effect	n = 48	60%
Adverse events	n = 32	40%
Side effects #		
Post massage soreness	n = 23	
Post treatment muscle soreness	n = 7	
Tiredness or fatigue	n = 7	
Headache	n = 5	
Increased pain	n = 5	
Exacerbation of symptoms	n = 2	
Dizziness	n = 2	
Other: Braxton hicks worse day after massage, bruising, heightened anxiety, unsettled digestion	n = 4	

Client could include more than one side effect.

3.1.3. Findings from the survey

The response rate for 1-week follow up was 79.2%, which included 21 individuals lost to follow up.

3.1.3.1. Massage side effects. Two fifths of the participants (n = 32, 40%) experienced one of more post-massage side effects. The most common side effect experienced after a massage consultation was post massage soreness, tiredness/fatigue and post treatment muscle soreness. See Table 4 for more detailed information

3.1.3.2. Mother or child related physical harm. One individual indicated that they experienced bleeding and two others indicated 'other' and provided information (swelling and pelvic instability). When these three events were investigated it was determined that all these events had occurred pre massage and were therefore unrelated to massage; the bleeding had occurred earlier in the pregnancy and was not present at the time of or post massage, the pelvic instability was what the individual was seeking treatment for and the swelling also occurred pre massage and did not change at the time of or post massage. Thus there were no mother or child related physical related harm experienced from massage by any of the participants.

3.2. Effect of massage

In this study the cohort received a significant improvement in pain ($p < 0.001$), stress ($p < 0.001$) and range of movement ($p < 0.001$) after the massage and one-week post massage ($p < 0.001$) compared to before the massage. The improvement was greatest after the massage and had decreased one-week post massage but was still significantly better than before the massage ($p < 0.001$). Sleep improved significantly from before the massage to a week post massage ($p < 0.001$). See Table 5 for more information.

4. Discussion

Overall, our study found that pregnancy and or postnatal massage-related side effects were experienced by two fifths of individuals and there were no mother or child related physical harm experienced from the massage treatments. While the study was not powered to investigate the safety of massage in regard to mother or child related physical harm, the lack of mother or child related physical harm events

Table 5
Effect of massage on pain, stress, range of movement and sleep.

	Before massage (n = 101)	After massage (n = 101)	1 week post massage (n = 80)	Pre to post massage	Pre massage to 1-week post massage	Post massage to 1-week post massage
	Mean scores (Standard Deviation)[#]			*p value and effect size*		
Pain	36.0 (26.5)	14.3 (16.9)	28.8 (26.6)	p < 0.001* 0.98	p < 0.001* 0.27	p = 0.069 0.65
Stress	32.8 (22.2)	10.3 (12.2)	26.4 (20.0)	p < 0.001* 1.26	p < 0.001* 0.30	p < 0.042* 0.97
Range of movement	33.6 (25.5)	16.4 (15.3)	29.2 (23.2)	p < 0.001* 0.82	p < 0.001* 0.18	p = 0.234 0.65
Sleep	62.5 (23.7)	**NA**	45.8 (26.4)	NA	p < 0.001* 0.67	NA

NA = not applicable.
[#] Higher scores equal greater pain, stress or restriction of movement or sleep more restless than usual.
* statistically significant p = < 0.05.

experienced by the individuals in our study lends credence to mythic nature of the statement that massage on the feet during pregnancy can lead to pre-term birth especially as 97% of our cohort received massage on their feet.

Sixty-one individuals in our cohort (60.4%) indicated they experienced lower back pain while pregnant which is representative of the prevalence rates found in other studies outside Australia (between 40.2%–81%) but higher than prevalence rates among Australian studies (35.5%–39.5%).[4] However, our study cohort only included people seeking massage, which may have inflated the prevalence rate somewhat. In our study, the number of individuals seeking massage for their lower back pain was 34 (33.7%), leaving 27 individuals who reported low back pain but did not seek massage treatment for their back pain. The reasons for why these 27 individuals did not seek massage treatment for their low back pain is not known but it is hypothesised that it could be that their low back pain was minor or they had more intense or severe pain in other areas and that was their focus of treatment or it could support the theory that pain is viewed as a 'normal' part of pregnancy and therefore some women don't seek treatment for it.[4]

Other than low back pain women in our cohort sought massage for hip pain, shoulder pain and stiffness, neck pain and stiffness and mental health (stress, anxiety or just to relax). This supports prior research that reports that massage is one of the primary therapies used for low back pain and neck pain in pregnancy.[4] The significant benefit found for massage in all areas (decreased pain and stress and increased range of movement and sleep) is promising and endorses research on the benefits of massage for pain reduction, reduced stress, increased range of motion and improved sleep in non-pregnant populations.[30–34] Further research using a comparator intervention is needed to determine the efficacy of massage during pregnancy and the postnatal period.

The significant benefits seen in reducing stress, decreasing pain, increasing range of motion and improving sleep lend support to the potential underlying mechanisms of massage therapy effects reported in Field's 2010 article which highlights the gate theory for pain reduction ("pain is carried more slowly by the less insulated C neurons and massage signals are carried more rapidly by the A neurons that close the gate to the C impulses"[35]) and increased vagal activity mediation ("stimulation of pressure receptors increase vagal activity immediately after the massage which project to the limbic system and involve the autonomic nervous system and cortisol secretion[35]) given there were significant changes from baseline both immediately post massage and one-week post massage.

Two fifths of pregnant and postnatal women in our study experienced massage-related side effects post massage. There is no research data on the rates of massage-related side effects experienced by pregnant women; however, there is data on massage-related side effects for non-pregnant populations. The rates of massage-related side effects seen in our study are similar to other non-pregnant rates for manual therapies (41%)[25] and higher rates for massage therapists alone (10%)[24]; It is hypothesised that pregnant and postpartum women may be more susceptible to massage-related side effects due to the presence of relaxin produced during pregnancy and its function of healing in skeletal muscle via the regulation of inflammation, tissue remodelling and fibrosis.[36] For individuals that received multiple massage treatments there appeared to be no pattern regarding post-massage side effects with some participants experiencing side effects after their first treatment and then not at subsequent visits while others experienced side effects after every massage and others experienced no side effects after any massage. No pattern regarding experiencing post-massage side effects related to the number of treatments received was detected. This supports the previously raised possibility that certain individuals are more prone to adverse events.[24]

4.1. Clinical significance

The practitioners involved in this study are experienced (having seen over 700 pregnant clients between them and working in a practice that focused on pregnancy and postnatal massage) and highly qualified therapists (both having undertaken post graduate training in pregnancy and postnatal massage). Thus, it is hypothesized that the results of the study are dependent on the experience and qualification of the therapists and that therapists with less experience, skill and fewer qualifications may induce greater massage-related side effects. Being aware of the woman's changing body during pregnancy and familiar with the musculoskeletal conditions that occur during pregnancy is integral to the therapist's decision making about the depth of pressure provided in the treatment and areas to be treated, which may be an influential factor in the frequency massage-related side effects. While it is unlikely that mother or child related physical harm from massage is directly influenced by inexperienced and lesser qualified therapists, more experienced and qualified therapists may be more skilled at recognising signs and symptoms that may require further investigation or referral and thus indirectly this may influence the events of mother or child related physical harm occurring in a clinical setting.

4.2. Further research

While our findings lead credence that massage on the feet during pregnancy is a myth the study was not powered to determine the safety of pregnancy massage and further research is needed. Given the prevalence of treatment for low back more research into the efficacy and effectiveness of massage therapy during pregnancy for low back pain is needed.

4.3. Limitations and strengths of the study

The study was not designed to collect data on other lifestyle factors the women were involved with such as exercise, diet, happiness,

relationship issues, levels of support, other treatments received or the patient-client therapeutic relationship. Thus we were not able to descriptively describe the cohort in relation to these factors or investigate aspects of emotional safety. Our study did not have a control group and this limits our findings especially in regard to the benefits of massage. Our sample self-selected to be part of the study thus this population may not represent all pregnant or postnatal women or all women receiving a massage during pregnancy or the postnatal period. The study sample may have been influence by bias due to the selective sample and the small sample size. The study, however, had very good recruitment and follow up rate and the participants represent a sample of women who do seek massage during pregnancy.

5. Conclusion

The study findings indicate that pregnancy and or postnatal massage-related side effects were experienced by two fifths of individuals and there were no mother or child related physical harm events experienced from the massage treatments. The lack of mother or child related physical harm events experienced by the individuals in our study lends credence to the mythic nature of the assertion that massage on the feet during pregnancy can lead to pre-term birth; however, the study was not powered to bust or confirm this 'myth'. Similar to previous research, low back pain was the most common condition that women sought massage treatment for, followed by hip pain, shoulder pain and stiffness, neck pain and stiffness and to improve mental health.

Competing interests

Catherine McInerney is the owner of Copeland Massage Therapy and Cath Stuart is the owner of Damara Massage. Neither Catherine nor Cath were not involved in the analysis of the data. Professor Hay receives sessional fees and lecture fees from the Australian Medical Council, Therapeutic Guidelines publication, and New South Wales Institute of Psychiatry and royalties from Hogrefe and Huber, McGraw Hill Education, and Blackwell Scientific Publications. Dr Sarah Fogarty is a practicing massage therapist. Other authors declare no conflict of interest.

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Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:https://doi.org/10.1016/j.ctim.2018.11.002.

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