

Introduction

It has been suggested that research studies informing third stage of labour practice guidelines and recommendations are questionable, particularly for women at low risk of post-partum haemorrhage (PPH) who choose to birth in midwife-led units or home birth settings (Baker et al. 2021). This paper discusses the findings from a literature review conducted in June 2021 and updated August 2021, to answer a research question. Are there any published studies have that investigated: *active verse expectant management of the third stage of labour and any related blood loss, during this period or shortly after in women, who had a normal physiological birth and gave birth or intended to give birth in a midwife-led unit?*

This literature review is important as research studies have reported many beneficial outcomes for healthy women at low risk of obstetric complications, who plan to give birth away from hospital obstetric led units, particularly for women who choose to birth in midwife-led units (Brocklehurst, et al., 2011; Christensen & Overgaard, 2017; Hodnett, Downe & Walsh, 2012; Hollowell et al., 2011).

Search strategy

The PICOS (Population, Intervention, Comparison and Outcomes, Study) tool was used as a structure to organise a list of terms, addressing the main issues in the research question (see Table 1).

Table 1: PICOS Tool to organise a list of terms

P:	Women receiving midwifery-led care, women giving birth in alternative institutional settings, midwifery-led care, midwife-led care alternative birth setting, alternative institutional birth setting, birth centres, birth centre, midwifery-led unit, midwife-led unit, midwifery unit
I:	Third stage, active management, expectant management, physiological management
C:	None identified at this stage
O:	Blood loss, postpartum haemorrhage, postpartum haemorrhage
S:	Primary study, quantitative study

The PICOS tool and its terms were then used to help search the electronic databases, to ensure the most comprehensive and unbiased searches possible. Advanced searches were conducted on the most relevant electronic databases used for medical and midwifery research. (EMBASE (Excerpta Medica Database); Psych Info (Psychology and allied fields); AMED (Allied and Complementary Medicine); HBE (Health Business Elite); PubMed, BNI (British Nursing Index), HMIC (Health Management Information Consortium); CINAHL (Cumulative Index to Nursing and Allied Health Literature) and Medline). No date was set when searching the electronic data bases for studies.

Reference lists from relevant studies were reviewed, hand searches were conducted on the last 2 years editions of the most frequently cited journals and key midwifery and medical journals (British Journal of Midwifery; Midwifery; Journal of Advanced Nursing; Birth and Women and Birth) and relevant internet resources were searched

(NICE; Cochrane Library; World Health Organisation (WHO); Royal College of Obstetrics and Gynaecology (RCOG)) for possible studies for this literature review.

Study Selection

From the electronic database results study selection was then conducted in two stages, to increase the transparency of the study selection process (CRD, 2009; University of York, 2021). An initial screening of titles and, where possible, abstracts, was conducted against pre-determined inclusion criteria; followed by obtaining in full all the research study papers that appeared to meet this pre-determined inclusion criteria, or those that were ambiguous, and screening the full paper against the pre-determined inclusion criteria.

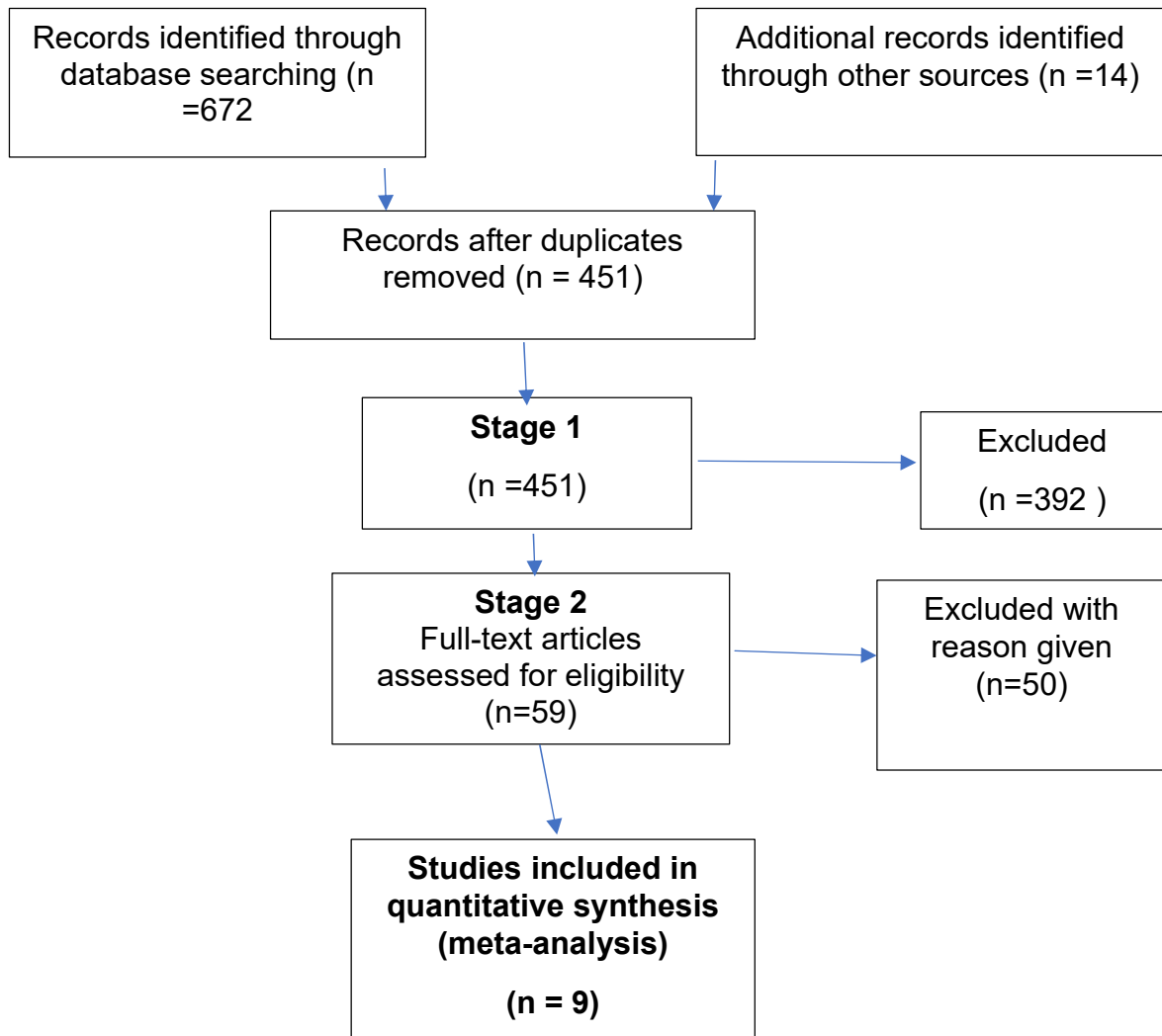
Research studies identified by looking at reference lists from relevant studies, hand-searching the most frequently cited journals and key midwifery and medical journals and searching relevant Internet resources were then assessed for inclusion in the review against the pre-determined inclusion criteria.

Results

686 research study papers were identified, with 451 remaining after removal of duplicates. 59 papers remained after screening the title and abstract. After reading the full text, nine papers (Begley et al., 2011; Davis et al., 2012; Dixon et al., 2009; 2013; Fahy, et al., 2010; Grigg et al., 2017; Kataoka, et al., 2018; Laws, et al., 2014; Monk, et al., 2014) appeared to meet the inclusion criteria (see PRISMA diagram; Figure 1). These papers were critically reviewed using a CASP (2018) tool and were judged to be of high enough quality to be included in this review.

All included studies compared, directly or indirectly, active versus expectant third stage management approaches for women at low risk of PPH giving birth in midwife-led units, in terms of blood loss during the third stage of labour and shortly thereafter. The studies included one RCT (Begley et al., 2011b); with the remainder being prospective or retrospective cohort studies.

Figure 1: PRISMA Flow Diagram



Outline and critique of identified papers

Davis et al. (2012) investigated the effect of planned place of birth on the risk of severe PPH (defined as blood loss of more than 1000 mL) and active compared with expectant management of the third stage of labour. The study analysed data collected from the New Zealand College of Midwives' research database for women giving birth in 2006 and 2007, who were classified as at low risk of PPH when labour commenced. Data was obtained for 39,677 births, of which 16,453 (41.5%) births met the study criteria. Outcomes were attributed to the planned place of birth at the onset of labour. The study found that the proportion of women who had a severe PPH was higher in the women who received active management, compared to those who received expectant management in all birth settings, (relative risk, [RR]: 2.14,

95% CI: 1.42–3.22). Women who received active management in primary level units (midwife-led units) were more than twice as likely to have a severe PPH, as women who received expectant management (1.7%, (23 women) versus 0.6%, (9 women)). However, twice as many women in the expectant management group went on to have further (uterotonic) treatment for excessive blood loss compared with those in the active management group (14.0% vs 7.3%).

Dixon et al. (2009) also analysed data collected from the New Zealand College of Midwives' research database, comparing active and expectant management of the third stage of labour for all normal physiological births from 2004 to 2008. 33,752 women met the study inclusion criteria. The study found that primary level units experienced a reduction in the occurrence of PPH, despite an increase in the use of expectant management (57.8%) compared to active management (42.2%). This was in comparison to the secondary and tertiary level units (obstetric-led units) which reported an increased proportion of active management (63.7% and 65.7% respectively) compared to expectant management (36.3% and 34.1 respectively). The proportion of blood loss of 501-1000 mL was 4.1%; and 0.99% for a blood loss greater than 1000 mL at the primary level unit. At the secondary and tertiary level units (obstetric-led units) the proportions of blood loss of 501-1000 mL were 4.2% and 5.2% respectively. For a blood loss greater than 1000 mL they were 1.2% and 1.5% respectively.

In a study further analysing the data from their 2009 study, Dixon et al. (2013) found women who had expectant management compared with active management received more treatment (use of an uterotonic drug) for excessive blood loss after birth. The relative risk of having treatment for excessive blood loss was 1.7 (95% confidence interval [CI] 1.6 to 1.8) for women in the expectant management group compared to the active management group. However, once the women had the uterotonic drug to treat excessive blood loss, those in the expectant management group were less at risk of a PPH compared with the active management group (RR: 0.54, 95%CI: 0.5 to 0.6). Amongst women in the expectant management group, 3.7% had a blood loss of more than 500mL, compared to 6.9% in the active management group.

Grigg et al. (2017) compared clinical outcomes for women intending to give birth in a freestanding midwife-led unit (n=407) or a tertiary level unit (obstetric-led unit) (n=285) in New Zealand. All but 29 of the women intending to birth in the midwife-led unit were identified as at low risk of obstetric complications and consequently, at low risk of PPH; whilst 29 women were identified as at high risk of obstetric complications and consequently, at high risk of PPH. The study found despite higher proportions of women who intended to birth in the midwife-led unit choosing expectant management compared with higher proportions of women, who intended to birth in the tertiary level unit choosing active management, the overall rates of PPH were similar (23.3% of women in the midwife-led unit, compared with 24.7% of women in the obstetric-led unit).

Fahy et al. (2010) collected and analysed data on women classified as low risk of PPH, who gave birth at a freestanding midwife-led unit from July 2005 to June 2008 (n=361 after exclusions for PPH risk factors) and at a tertiary level maternity unit (comprising of an obstetric-led unit and an alongside midwife-led unit) from January 2006 to June 2008 (n=3436 after exclusions for PPH risk factors). The study was conducted in New South Wales, Australia. At the tertiary maternity unit, active management of labour was the policy and almost universal practice. Expectant management was mainly practised at the freestanding midwife-led unit and midwives who worked there received extra training in this management approach. The study revealed that 11.2% (344 of 3075) of women who received active management (the intended management approach at the tertiary level unit) experienced a PPH; compared to 2.8% (10 of 361) of women who had expectant management (the intended management approach at the freestanding midwife-led unit). The difference was statistically significant (odds ratio [OR] 4.4, 95% CI: 2.3 to 8.4).

Laws et al. (2014) conducted a matched pairs cohort study of women defined as at low risk of PPH in New South Wales, Australia. Maternal outcomes for these women, who intended to birth at midwife-led units were matched with women who intended to give birth at alongside hospital's obstetric-led units. Data was collected between 2001 and 2009 from the computerised maternity notes of 15,742 women, who intended to birth at the midwife-led units and met the study criteria, and from the computerised maternity notes of 66,190 women who intended to give birth in the

alongside hospital's obstetric-led units during the same period. PPH incidence at the obstetric-led units was 10.6% compared with 8.6% at the midwife-led units. This difference was statistically significant (OR 0.79, 95% CI: 0.74 to 0.85), despite a much higher rate in expectant management of the third stage at the midwife-led units (24.4 versus 2.0%).

Monk et al. (2014) investigated specified maternal and neonatal outcomes in women at low risk of obstetric complications in New South Wales, Australia; comparing women giving birth in freestanding midwife-led units in regional and urban areas, with women intending to give birth in tertiary level units. Data was collected from the computerised maternity notes of women, who met the study criteria and booked to give birth at the freestanding midwife-led units (n=494) and the tertiary-level units (n=3,157), from 2010 over a 17-month period. Prevalence of PPH on the freestanding midwife-led units was 9.7% compared to 15.4% on the tertiary level units, which was statistically significant (p=0.031); despite a higher incidence of expectant management for these women, compared with women booked on the tertiary-level units (37.4% compared with 2.9%).

Begley et al. (2011) conducted an RCT comparing midwife-led care (n=1,101) versus consultant-led care (n=552) for women at low risk of childbirth complications in Ireland. Findings from the study were that despite an increase in expectant management at the midwife-led unit compared to the obstetric-led unit (12.4%, 137 of 1101 versus 0.2%, 1 of 552; RR 68.69) there was no statistically significant difference in estimated mean blood loss, during the third stage of labour or shortly after (323 mL (SD 317 mL) vs 324 mL (SD 401 mL); MD 6.17, 95% CI 32.12, 44.46); and incidence of PPH (13.1%, 144 of 1101 versus 13.6%, 75 of 552; RR 0.96, 95% CI 0.74, 1.25).

Kataoka et al. (2018) conducted a study comparing numerous maternal and neonatal outcomes in midwife-led and hospital obstetric-led units in Japan, including PPH (defined as blood loss of more than 1000 mL) during the third stage of labour or shortly after birth. The study consisted of 9588 women at low risk of obstetric complications who had a spontaneous vaginal birth in one of 19 birth centres (midwife-led units), or in one of two hospital obstetric-led units. Data for the study

was collected from maternity computerised records for women who birthed in the midwife-led units from 2001 to 2006, consisting of 5379 women; and for women who birthed in the hospital's obstetric-led units from 2004 to 2006 and from 2008 to 2009, consisting of 4209 women.

The study found a higher incidence of PPH (defined as blood loss of more than 1000 mL) in women who birthed on the birth centres (22.1%) where women received expectant management compared to women who birthed on the hospital obstetric-led units (18.4%), where women received active management. This difference was statistically significant; (OR 1.47, 95% CI: 1.31 to 1.64, $P < 0.001$). However, women with risk factors for PPH identified by NICE (2017), including maternal age 35 or over, parity 4 or more, and baby's birth weight 4 kg or more, received expectant management in the midwife-led units. Additionally, during the time the study was conducted midwives working in the midwife-led units were not able to convert to active management if the woman experienced excessive blood loss. These factors may have led to an increase in blood loss during the third stage or shortly after for women who birthed on the midwife-led unit, where expectant third stage management approach was practised. Since this study was conducted, midwives practising at midwife-led units in Japan are now able to convert to active management, if women develop risk factors for PPH or experience excessive blood loss during the third stage of labour or shortly thereafter.

Summary

This literature review identified nine studies that directly or indirectly compared blood loss in women receiving active or expectant management approaches during the third stage of labour and shortly after birth. Most women in these studies were identified as at low risk of PPH and gave birth in a variety of birth settings, including midwife-led and obstetric-led units.

Studies by Davis et al. (2012) and Fahy et al. (2010) found higher incidences of PPH with active management compared with expectant management in all birth settings. Although twice as many women receiving expectant management went on to have further (uterotonic drug) treatment for excessive blood loss, compared with those

receiving active management (Davis et al., 2012). The study by Dixon et al. (2013) found that women who received expectant management and had treatment for excessive blood loss (use of an uterotonic drug) after birth were then less at risk of having a PPH than women who received active management.

The studies by Dixon et al. (2009), Grigg et al. (2017), Laws et al. (2014) and Monk et al. (2014) revealed a lower incidence of PPH in midwife-led units, despite an increased rate of expectant management and a reduced rate of active management. This was in comparison to the obstetric-led units, where there was an increased rate of active management and a reduced rate of expectant management.

Begley et al. (2011) also found that despite an increase in expectant management in midwife-led units compared to obstetric units, there was no significant difference in estimated mean blood loss during the third stage of labour or shortly thereafter, or in the incidence of PPH. Therefore, it can be inferred that expectant management did not lead to a higher rate of PPH. However, Kataoka et al. (2018) found a significantly higher incidence of PPH (defined as blood loss of more than 1000 mL) in women, who birthed in midwife-led units, where women received expectant management, compared to the hospital obstetric-led units where women received active management. However, the generalisability of the findings of this study may be limited by the unknown effects of PPH risk factors on PPH incidence. Furthermore, the inability of midwives to convert to active management if excessive bleeding was observed during the third stage of labour reduces the generalisability of the findings of this study to the UK and other settings, where midwives convert to active management if blood loss during the third stage is perceived by them to be excessive.

Discussion

There is a lack of studies that directly compare the incidence of PPH in women, receiving active or expectant management, at low risk of PPH giving birth in midwife-led units; with no identified studies conducted in the UK. Only two studies were identified that directly examined the incidence of PPH and active verse expectant management in women at low risk of PPH, giving birth in midwife-led units (Davis et al., 2012; Fahy et al., 2010). One of these studies, consisting of a large national

study, only examined the incidence of severe PPH (defined as blood loss of more than 1000 mL) (Davis et al., 2012). The other study (Fahy et al., 2010) was a small-scale study in which the low numbers of women may have limited reliability, validity and generalisability of the study's findings.

The studies identified in this review were also of varying quality and their generalisability to women at low risk of PPH, who have a physiological birth, and give birth in midwife-led units, in the UK is limited. The studies identified in this literature review were not stated as evidence by international (WHO, 2012; 2018) and national third stage of labour practice guidelines (NICE, 2017; RMC, 2018; RCOG, 2016); and were not included in Cochrane Reviews (Begley et al., 2010; 2011a; 2015; 2019; Prendiville, et al., 2000) comparing active and expectant management. One of the reasons for not being included as evidence or included in these Cochrane Reviews (Begley et al., 2010; 2011a; 2015; 2019; Prendiville, et al., 2000) may have been eight of the studies identified in this literature review were cohort studies. The evidence informing international (WHO, 2012; 2018) and national third stage of labour practice guidelines (NICE, 2017; RMC, 2018; RCOG, 2016); and the Cochrane Reviews, comparing active and expectant management, only included RCTs. This is because RCTs are held as the gold standard for evaluating the effectiveness of interventions (Schulza, K.F., Altmanb, D.G. & Moherc., 2010; Torgerson & Torgerson, 2008).

Although, it has been questioned whether an RCT is appropriate to investigate an expectant third stage of labour management approach and any associated blood loss (Fahy et al., 2009). This is because for a woman to participate in an RCT, investigating an expectant third stage of labour management approach and associated blood loss, she should be randomised after the birth of the baby. At this point it will be known if she has had a spontaneous vaginal birth and is at low risk of PPH. This is essential, as expectant management is only appropriate for women who have had a normal physiological birth and are at low risk of PPH. However, Fahy et al. also comments that to randomise women after the birth of their baby would be unethical. This is due to difficulties regarding obtaining informed consent. It has also been commented that asking women to think about taking part in a study and give their informed consent during this stage of labour, might be an intervention that

disturbs their hormones and impacts on the birthing process, including the birth of the placenta and membranes (Edwards & Wickham, 2018). Consequently, to conduct an RCT to investigate an expectant third stage of labour management approach and any associated blood loss, during the third stage or shortly after might not be appropriate.

Conclusion

There is a need for further research studies investigating third stage of labour management approaches and any related blood loss, during this period or shortly after in women who had a normal physiological birth and give birth in a midwife-led unit. This is because research studies have reported many beneficial outcomes for healthy women at low risk of obstetric complications, who plan to birth in midwife-led units.

Key points:

1. Research studies informing third stage of labour practice guidelines and recommendations are questionable, particularly for women at low risk of PPH who choose to birth in midwife-led units.
2. This literature review found limited studies of varying quality that investigated active versus expectant management and any related blood loss in women at low risk of PPH, who had a normal physiological in a midwife-led unit.
3. The generalisability of the studies identified in this literature review to women at low risk of PPH, who have a physiological normal birth, and give birth in midwife-led units, in the UK is limited.
4. More studies are needed as, research studies have reported many beneficial outcomes for women at low risk of obstetric complications, who choose to birth in midwife-led units.

Questions:

1. Do you think your third stage of labour practice guideline is generalisable to women at low risk of obstetric complications who choose to birth away from a hospital obstetric-led unit?

2. How have you come to this conclusion?
3. When was the last time you questioned the evidence practice guidelines are based on?
4. When was the last time you reviewed the evidence practice guidelines are based on and assessed if they are generalisable to the woman you are providing care for?

Keywords

Literature review; third stage of labour; midwife-led units; active management; expectant management; postpartum haemorrhage, blood loss

References

Baker, K, Stephenson, J., Leeming D. (2021). Clinical Review: First Stage of Labour Care. British Journal of Midwifery In press

Begley, C.M., Devane, D., Clarke, M., McCann, C., Hughes, P., Reilly, M., et al. (2011b). Comparison of midwife-led and consultant-led care of healthy women at low risk of childbirth complications in the Republic of Ireland: a randomised trial. BMC Pregnancy and Childbirth, 11, 85–94. doi: 10.1186/1471-2393-11-85

Brocklehurst, P., Hardy, P., Hollowell, J., Linsell, L., Macfarlane, A., Marlow, N., et al. (2011). Perinatal and maternal outcomes by planned place of birth for healthy women with low risk pregnancies: The Birthplace in England national prospective cohort study. British Medical Journal.;7400 doi: 10.1136/bmj.d7400.

Christensen, L. F. & Overgaard, C. (2017). Are freestanding midwifery units a safe alternative to obstetric units for low-risk, primiparous childbirth? An analysis of effect differences by parity in a matched cohort study. BMC Pregnancy and Childbirth, 17, 14.

Critical Appraisal Skills Programme [CASP] (2018). CASP Checklists, [online] Available at: <https://casp-uk.net/casp-tools-checklists/>

Centre for Reviews and Dissemination, (CRD). (2009). Systematic Reviews, CRD guidance for undertaking systematic reviews in healthcare. University of York. Available at: https://www.york.ac.uk/media/crd/Systematic_Reviews.pdf

Davis, D., Baddock, S., Pairman, S., Hunter, M., Benn, C., Anderson, J., Dixon, L., Herbison, P. (2012). Risk of severe postpartum hemorrhage in low-risk childbearing women in New Zealand: exploring the effect of place of birth and comparing third stage management of labor. Birth, 39 (2), 98-105

Dixon, L., Fletcher, L. Tracy, S., Guilliland, K., Pairman S.& Hendry, C. (2009). Midwives care during the third stage of labour: An analysis of the New Zealand

College of Midwives. Midwives Database 2004-2008. New Zealand College of Midwives Journal, 41, 20-25.

Dixon, L., Tracy, S., Guilliland, K., Fletcher, L., Hendry, C. & Pairman S. (2013). Outcomes of physiological and active third stage labour care amongst women in New Zealand. *Midwifery*, 29:67-74. doi: 10.1016/j.midw.2011. 11.003

Edwards E. & Wickham, S. (2018). *Birthing Your Placenta the third stage of labour*. Edinburgh: Birthmoon Creations.

Fayh, K.M. (2009). Third stage of labour care for women at low risk of postpartum haemorrhage. *Journal of Midwifery and Women's Health*, 54(5),380-386

Fahy, K., Hastie, C., Bisits, A., Marsh, C., Smith, L. & Saxton, A. (2010). Holistic physiological care compared with active management of the third stage of labour for women at low risk of postpartum haemorrhage: a cohort study. *Women & Birth: Journal of the Australian College of Midwives*, 23(4),146-52.

Grigg, C.P, Tracy, S.K., Tracy, M., Daellenbach, R., Kensington, M., Monk, A., Schmied, V. (2017). Evaluating Maternity Units: a prospective cohort study of freestanding midwife-led primary maternity units in New Zealand clinical outcomes. *BMJ open*, 7 (8), e016288. doi: 10.1136/bmjopen-2017-016288.

Hodnett, E.D., Downe, S. & Walsh, D. (2012). Alternative versus conventional institutional settings for birth. *Cochrane Database of Systematic Reviews*, Issue 8. Art. No.: CD000012. doi: 10.1002/14651858.CD000012.pub4.

Hollowell J, Puddicombe D, Rowe R, Linsell L, Hardy P, Stewart, M, Redshaw, M., Newburn, M., McCourt, C. Sandall, J., Macfarlane, A., Silverton, L., Brocklehurst, P. (2011). The Birthplace national prospective cohort study: perinatal and maternal outcomes by planned place of birth. Birthplace in England research programme. Final report part 4. NIHR Service Delivery and Organisation programme. Retrieved from http://www.nets.nihr.ac.uk/data/assets/pdf_file/0006/84948/SDO_FR4_-08-1604-140_V04.pdf

Kataoka, Y., Masuzawa, Y., Kato, C. Eto, H. (2018). Maternal and neonatal outcomes in birth centers versus hospitals among women with low-risk pregnancies in Japan: A retrospective cohort study. *Japan Journal of Nursing Science*; 15(1), 91-96.

Laws, P. J., Xu, F., Welsh, A., Tracy, S.K., Sullivan, E. A. (2014). Maternal Morbidity of Women Receiving Birth Center Care in New South Wales: A 189 Matched-Pair Analysis Using Linked Health Data. *Birth: Issues in Perinatal Care*, 41(3), 268-275.

Monk A; Tracy M; Foureur M; Grigg C; Tracy S. (2014). Evaluating Midwifery Units (EMU): a prospective cohort study of freestanding midwifery units in New South Wales, Australia. *British Medical Journal, open*, 4 (10), p. e006252.

National Institute for Health and Care Excellence. (2017) *Intrapartum Care for healthy women and babies*. [NICE guideline]. Available at:

<https://www.nice.org.uk/guidance/cg190/resources/intrapartum-care-for-healthy-women-and-babies-pdf-35109866447557>

Royal College of Obstetrics and Gynaecology, (RCOG). (2016). Prevention of postpartum haemorrhage. Clinical Guideline 52. London: RCOG Press. Available at: <http://onlinelibrary.wiley.com/doi/10.1111/1471-0528.14178/epdf>

Royal College of Midwives, (RCM). (2018). Midwifery Blue Top Guidance, No 1. Available at: <https://www.rcm.org.uk/media/2539/professionals-blue-top-guidance.pdf>

Schulza, K.F., Altman, D.G. & Moher, D. (2010). CONSORT 2010 Statement: Updated guidelines for reporting parallel group randomised trials, *Journal of Clinical Epidemiology*, doi:10.1016/j.jclinepi.2010.02.005.

Torgerson, D. & Torgerson, C. (2008). *Designing randomised trials in health, education and social science. An introduction.* Hampshire: Palgrave Macmillan.

University of York, (2021). *Systematic Review. A Practical Guide.* Available at: <https://subjectguides.york.ac.uk/systematic-review/expectations>

World Health Organization. (WHO). (2012). WHO recommendations for the prevention and treatment of postpartum haemorrhage [online]. Geneva. Available at: http://apps.who.int/iris/bitstream/10665/75411/1/9789241548502_eng.pdf?ua=1

World Health Organization. (2018). WHO recommendations on intrapartum care for a positive childbirth experience. Available at: https://apps.who.int/iris/bitstream/handle/10665/260178/9789241550215_eng.pdf