



THE EFFICACY OF MODIFIED VIENNESE MANUAL
PERINEAL PROTECTION (VMPP) VERSUS
CONVENTIONAL TECHNIQUE IN PERINEAL
PROTECTION AT SECOND STAGE OF LABOUR: A
RANDOMIZE CASE CONTROL

BY

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degree of Master of Obstetrics and Gynaecology

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ABSTRACT

The modified Viennese manual perineal protection (VMPP) is a modified method based on an experimental study on a computerized biomechanical model of the perineum by Jansova and colleagues. It determines the exact placement of fingers on the perineum that has less perineal tension with the minimal perineal injury. The aim of study is to evaluate the effectiveness of modified VMPP in protecting the perineal injury and need of episiotomy compared to conventional method. The associated risk factors for perineal injury were also identified. A randomized case control study on women in labour without previous vaginal delivery at a tertiary hospital. The modified VMPP was based on a method described by Jansova et al., (2014). The sanitary pad was used to support and protect perineum in the control group. Total of 158 women were recruited and divided into modified VMPP group (n=71) and control group (n=78). Nine cases were excluded due to instrumental deliveries. Thirty two (21.5%) women had intact perineum mainly in modified VMPP group (n=21) and control group (n=11) (p=0.022). There were 81 (54.4%) cases of first degree perineal tear, 16 (10.7%) second degree tear and 26 (18.7%) required episiotomy which is more in the control group (p=0.548). None of the participants suffered third or fourth degree perineal tears. The more advanced maternal age (OR 1.149, p=0.043), the higher BMI (OR 1.113, p=0.027) and larger infant's head circumference (OR 1.681, p=0.049), the higher the risk of perineal injury. In conclusion, modified VMPP is effective in minimizing perineal injury with less need for an episiotomy. The risk of perineal injury is higher with increasing maternal age, BMI and fetal head circumference.

APPROVAL PAGE

I certify that I have supervised and read this study and that in my opinion, it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a thesis for the degree of Master of Obstetrics and Gynaecology.

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DECLARATION

I hereby declare that this dissertation is the result of my own investigations, except where otherwise stated. I also declare that it has not been previously or concurrently submitted as a whole for any other degrees at IIUM or other institutions.

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LIST OF ABBREVIATIONS

BMI	Body mass index
HTAA	Hospital Tengku Ampuan Afzan
LSCS	Lower segment caesarean section
OASIS	Obstetric anal sphincter injuries
OP	Occipito-posterior
VBAC	Vaginal birth after caesarean
VMPP	Viennese manual perineal protection

CHAPTER ONE

INTRODUCTION

A large number of vaginal deliveries are afflicted with perineal trauma which has a chance of occurring either spontaneously or due to an episiotomy (Albers, 2003; Zainur & Loh, 2006). The occurrence of perineal trauma can be cited as a range from 83% to 95% (McCandlish et al., 1998; Zainur & Loh, 2006). The number for trauma occurrence that involves the anal sphincter complex is said to have the range between 1% and 11% (Laine, Skjeldestad, Sandvik, & Staff, 2012; Thakar & Sultan, 2003). The incidence of extensive perineal tears also has increased in the last decades (Laine, Rotvold, & Staff, 2013). Ample discrepancies can be seen in the perineal trauma reporting rates among different countries, which is partially attributed to variation in the definition as well how reporting is done in that certain country (Byrd, Hobbiss, & Tasker, 2005).

Trauma of the perineum is closely linked to a myriad of complications which includes perineal pain, infection, haemorrhage, painful during intercourse, uterovaginal prolapse, urinary and faecal incontinence (Laine et al., 2012; Thakar & Sultan, 2003). The associated morbidities may have a further impact on the women's recovery, health and psychological wellbeing. It also affects the women's ability to bond with her newborn and manage the trials and tribulations of motherhood (Sleep, 1991).

Injuries of the perineum are significantly linked to the maternal age of 30 years or older, primigravida, previous caesarean delivery, instrumental delivery, episiotomy, prolonged second stage (more than one hour), occipito-posterior position (OP), epidural analgesia, shoulder dystocia, birth weight 4000g or more and head

circumference 35cm or more (Andrews, Sultan, Thakar, & Jones, 2006; Fowler, 2009; Fowler, 2010; Lavesson et al., 2014; Thakar & Sultan, 2003).

Perineal lacerations could weaken the pelvic floor muscles (Handa, Blomquist, McDermott, Friedman, & Munoz, 2012). Thus, it is associated with pelvic floor disorders five to ten years after a first time delivery. Women whom experience lacerations of the perineum in two or more deliveries are at an increased risk of developing prolapse (Handa et al., 2012). Perineal and pelvic floor complications such as perineal pain, dyspareunia as well as weak pelvic floor musculature are significantly higher for those who receive episiotomies compared to women with remain intact perineum or sustained spontaneous perineal tears (Awwad, Sayegh, Yeretzian, & Deeb, 2012; Baksu, Davas, Agar, Akyol, & Varolan, 2007; De Tayrac, Panel, Masson, & Mares, 2006; Hartmann et al., 2005; Hudelist et al., 2005; Klein et al., 1994).

Aspects of sexual function; arousal, lubrication, orgasm and satisfaction are afflicted after a mediolateral episiotomy is performed beyond the puerperal period (Baksu et al., 2007). Hence, routine episiotomy should be avoided.

Therefore, management of the second stage of labour the aim of reducing injury to the perineum is an important issue in obstetrics. A great number of studies were carried out with the intention of evaluating the best technique to reduce perineal injuries especially obstetrics anal sphincter injuries (OASIS).

Modified VMPP method is a technique to reduce the perineal tension throughout the full thickness of the perineum in the midline to minimize perineal injury present at the second stage of labour. A study concerning the modified VMPP method utilising a novel biomechanical model of perineum at New Technologies for Information Society, Pilsen, Czech Republic (NTIS). The modified VMPP method

emphasised on precise placement of the thumbs and index finger during tension of perineal tissue. This modified VMPP method was compared with the hands-off delivery techniques. Stress distribution between modified VMPP method showed a wide variation in peak perineal tension from 72% to 102% compared with 100% for the hands-off technique. The most effective modified VMPP method is initial position of fingers 12cm apart ($x = \pm 6\text{cm}$) on the x-axis, 2cm anteriorly from the posterior fourchette ($y = \pm 2\text{cm}$) on the y-axis. At the time of pushing till expulsion, the thumb and index finger were then moved 1cm toward midline on the x-axis. There was no movement on the y-axis (Jansova et al., 2014).

The incidence of perineal injuries among primigravida who delivered in HTAA in year the 2012, 2013 and 2014 were 99.6%, 97.4% and 95.9% respectively. The prevalence of episiotomy among primigravida were 93.3% (2012), 90.0% (2013) and 87% (2014). The prevalence of episiotomy is still high among primigravida even though the trend is decreasing. Therefore it is important to determine the most effective technique of perineal protection at the second stage of labour that can minimize perineal injuries and OASIS. Thus, the morbidity can be reduced with better quality of women's life in future.

This study aims to determine the effectiveness of modified VMPP in preventing perineal injuries as well as the needs of episiotomy between modified VMPP and control group. The risk factors associated with perineal injury were also identified.

CHAPTER TWO

LITERATURE REVIEW

Trauma to the perineum is closely linked to a great deal of morbidities of different lengths. Pain experienced from trauma to the perineum is at its most severe during the post natal period of about a couple of weeks postpartum in about 42% of women (Macarthur & Macarthur, 2004). OASIS is associated with more perineal pain than other perineal trauma (Andrews, Thakar, Sultan, & Jones, 2008). It can interfere with the women's ability to bond with her newborn. If severe, may lead to difficulty in voiding and defecation.

Maternal morbidity from perineal trauma includes dyspareunia, urinary and faecal incontinence (Barrett et al., 2000; Boyles, Li, Mori, Osterweil, & Guise, 2009; Sultan & Fernando, 2001). The morbidities previously listed could result in a myriad of physical, psychological as well as social problems. Urinary dysfunction after childbirth is seen to be of a higher incidence when it is associated with trauma of the perineum (Boyles et al., 2009). Urinary incontinence symptoms more likely are related to pudendal nerve damage and tissue stretching. Stool incontinence is seen in approximately 8% of women and 45% experience incontinence of flatus following an injury to the anal sphincter (Eason, Labrecque, Marcoux, & Mondor, 2002). Unfortunately, about 33% of women sustained an occult to the anal sphincter during the course of vaginal delivery. It is probably due to either an undiagnosed injury or misclassification degree perineal tears (Zainur & Loh, 2006).

It can be seen that the women who report of an undamaged perineum, note reduced pain during sexual intercourse, as well as a better sexual experience and

sensation, not limiting the chance of an orgasm occurring around the six months postpartum period (Rådestad, Olsson, Nissen, & Rubertsson, 2008; Williams, Herron-Marx, & Carolyn, 2007). Dyspareunia can have an impact on women's psychosexual health in the form of abstinence for many years (Fowler, 2010).

Women who sustained perineal injury are significantly at risk of pelvic floor disorders five to ten years after first delivery and the risk is even higher after two and more deliveries (Handa et al., 2012). An increased time period seen in the second stage of labour (above 30 minutes) is associated with pudendal nerve damage and has been found to be associated with pelvic organ prolapse (Dietz & Bennett, 2003; Heit, Mudd, & Culligan, 2001; Sultan & Fernando, 2001). There is a direct correlation between the level of morbidity and the level of the injured perineum sustained. The first and second perineal tear are associated with less severe morbidity compared to OASIS (Rådestad et al., 2008; Williams et al., 2007).

Numerous risk factors for perineal trauma had been widely studied, with several hundred studies assessing maternal, obstetric and fetal risk factors may assist in identify the risk factors in preventing perineal injuries.

Several retrospective studies showed that the associated risk factors for perineal trauma include labour induction (up to 2%), analgesia of the epidura (until 2%), birth weight above 4kg (until 2%), persistent occipito-posterior position (until 3%), primigravida (up to 4%), a second stage above 60 minutes (up to 4%) and delivery by instrumentation i.e. forceps (up to 7%) (RCOG Guideline, 2007). These were confirmed by a systemic review of 14 studies (Adams, Bricker, Richmond, & Neilson, 2001; Fowler, 2010).

Episiotomy is a significant risk factor for perineal trauma. Even though, there is conflicting evidence in the literature regarding episiotomy. Up until now it is taught

that episiotomies quell trauma that occurs during delivery by protecting the perineal region. A number of authors have shown the efficacy of the mediolateral episiotomy with its protection of the perineum yet there are some whom have reported otherwise. Systemic review by Eason, Labrecque, Wells, and Feldman (2000) found that by avoiding the routine episiotomy, the perineal injury was significantly decreased. Cochrane database of systemic reviews showed there was a reduced number of posterior trauma to the perineum, reduced suturing as well as a reduced number of complications, a uniformity for most pain measures, not to mention intense perineal trauma with restrictive episiotomy (Carroli & Mignini, 2009). It consistently shown that there were no benefits from the routine use of episiotomy (Carroli & Mignini, 2009; Eason et al., 2000; Steiner, Weintraub, Wiznitzer, Sergienko, & Sheiner, 2012). However, OASIS occurrences vary with the episiotomy type. It can be seen that there is a higher occurrence of OASIS in median episiotomy when it is in comparison to mediolateral episiotomy (Eason et al., 2000). The latest systemic review by Pergialiotis, Vlachos, Protopapas, Pappa, and Vlachos (2014) has shown that median episiotomy was more associated with significant perineal trauma (OR 3.82 (95% CI, 1.96 – 7.42, p=0.002) compared to mediolateral episiotomy (OR 1.72 (95% CI, 0.81 – 3.65, p=0.001).

There is an increased incidence of OASIS in instrumental deliveries when they are in comparison with those of the normal delivery. Recent systemic review by Pergialiotis et al (2014) found that incidence of severe perineal injuries is increased regardless either forceps or vacuum delivery (Pergialiotis et al., 2014). Eason et al (2000) also found that the risk of perineal injuries was high with both instruments. More women on epidural analgesia during delivery had perineal injury with OR 2.29 (95% CI 1.89-2.71, p=0.003). Persistent OP position in labour is associated with

severe perineal injuries OR 3.09 (95% CI 1.81-5.29, p=0.003) (Groutz et al., 2011; Pergialiotis et al., 2014).

Both maternal age and gestational weeks showed no significance difference between perineal injuries and intact perineum (Angioli, Gómez-Marín, Cantuaria, & O'Sullivan, 2000; Aukee, Sundström, & Kairaluoma, 2006; Eogan, Daly, O'Connell, & O'Herlihy, 2006; Groutz et al., 2011; Pergialiotis et al., 2014; Riskin-Mashiah, Smith, & Wilkins, 2002). Lowder, Burrows, Krohn, and Weber (2007) reported that perineal injuries was significantly higher among women with vaginal birth after caesarean (VBAC) compared with multiparous women (OR 5.1 (95% CI, 4.2 – 5.9, p=0.001). However, there was no difference with primiparous women. Groutz et al. (2011) also reported that perineal laceration among women with VBAC was higher compared to women with non-VBAC but these findings do not reach statistical significance. Laine et al. (2012) also reported women with a previous caesarean section and without prior vaginal delivery had an increased OASIS risk compared to primiparous.

Management of the second stage of labour in reducing risk of trauma to the perineum is still an important issue in obstetrics. Awareness regarding the myriad of complications that follow trauma to the perineum has led to the quest of developing different methods of preventing trauma to the perineum at the second stage of labour. These methods of intervention doth include massaging the perineum, applying warm compresses to as well as perineal management technique (Albers, Sedler, Bedrick, Teaf, & Peralta, 2005; Dahlen et al., 2007; Myrfield, Brook, & Creedy, 1997; Stamp, Kruzins, & Crowther, 2001). The Cochrane review about the perineal technique that occurs in the midst of the second stage of labour in aiding the reduction of the number trauma to the perineum numbers had indicated towards the compelling effect of warm

compress in reducing third and fourth degree tears. There was also a compelling effect that favours massaging the perineum rather than a hands-off approach in reducing the incidence of OASIS. Hands-off showed no effect on OASIS but it is significant in reducing the episiotomy rate (Aasheim, Nilsen, Lukasse, & Reinar, 2011).

CHAPTER THREE

METHODOLOGY

3.1 DESIGN/ SETTING OF THE STUDY

This was a randomised case control study conducted at HTAA between January till December 2015.

3.1.1 Study population

All primigravidae and pseudo primigravidae who never had vaginal delivery before were included in this study. Women with multiple pregnancy, abnormal presentation, abnormal lie, on epidural, instrumental delivery, infants on OP position, shoulder dystocia, intra-uterine death and emergency caesarean were excluded from this study.

All participants who consented to the study were randomised into two groups either intervention group which is modified VMPP or control group by using closed envelope. The closed envelopes are kept in the Labour Suite.

3.1.2 Methods

The participants were recruited upon admission to the Labour Suite. The delivery was conducted by two research assistants who were trained for VMPP and familiar with the conventional technique.

The modified VMPP method is a technique used whereby the tip of the thumb and index finger of the accoucheur's dominant hand were placed alongside the vaginal introitus at crowning (Figure 3.1). The point of placement was measured by using the same ruler and marked with the marker pen. The initial position (point A), whereby the thumb and index finger is 12cm apart on the x-axis ($x = \pm 6\text{cm}$) and 2 cm

anteriorly from the posterior fourchette on the y-axis ($y = + 2\text{cm}$). Then, the thumb and index finger were moved 1 cm toward the midline on the x-axis ($\Delta x = 1\text{cm}$) without any movement on the y-axis ($\Delta y = 0\text{cm}$) which is point B. This manoeuver is maintained throughout the maternal pushing until expulsion of the fetal head. Meanwhile, the non-dominant hand controlled the fetal head expulsion (Jansova et al., 2014; Jansova, et al., 2014; Zemčik et al., 2012).

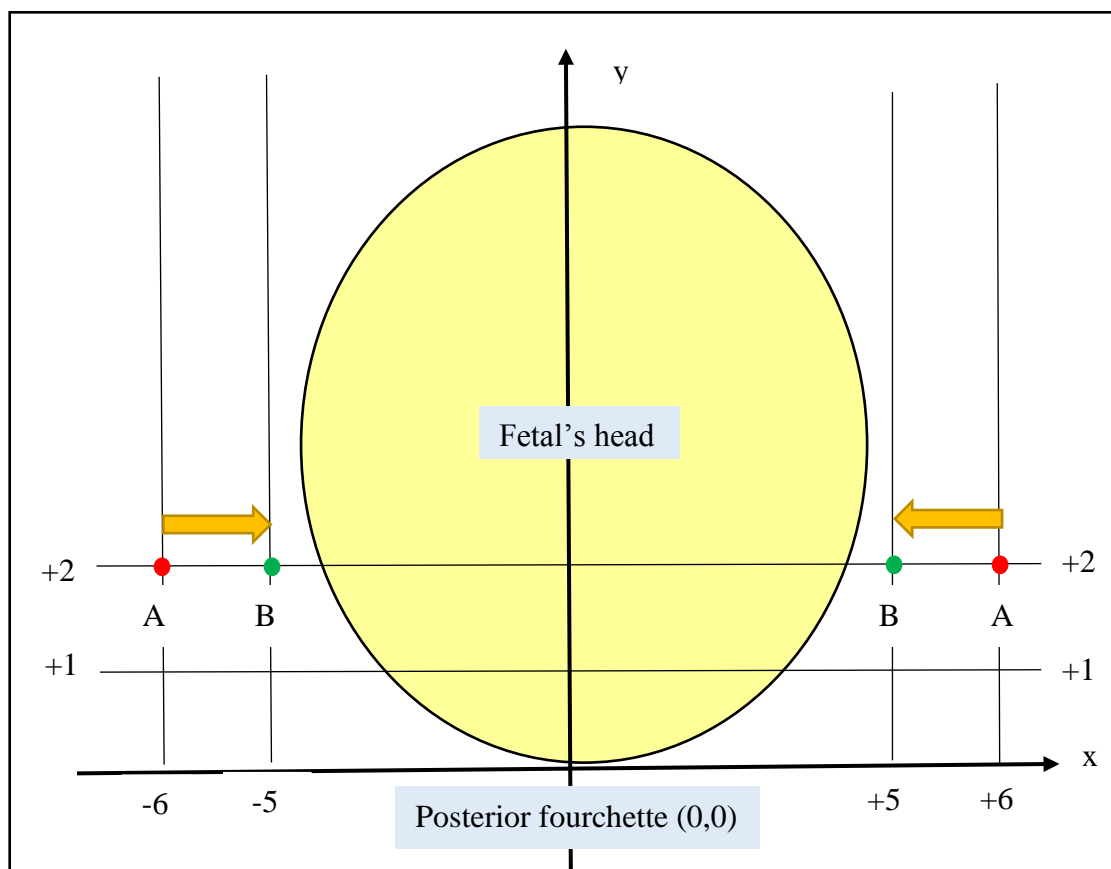


Figure 3.1 Scheme of initial and final locations of the thumb and index finger in modified VMPP on axial planes of perineum.

The control group was delivered using the conventional technique as per routine practice in the labour suite. The accoucheur's non-dominant hand applies

pressure on the head of the fetus while his/hers dominant hand is placed against the perineum with a pad to support this structure without routine episiotomy (Mayerhofer et al., 2002).

The first to fourth degree perineal tear is defined according to Sultan (Thakar & Sultan, 2003) (Eskandar & Shet, 2009) (RCOG Guideline, 2007). The assessment of perineal tear was performed by a trained medical officer. The third and fourth degree perineal tear were further confirmed by the specialists.

Table 3.1 Classification of perineal trauma

Types of tear	Definition
1st degree perineal tear	Injury to perineal skin and/or vaginal mucosa.
2nd degree perineal tear	Injury to perineum involving perineal muscles but not involving the anal sphincter.
3 rd degree perineal tear	Injury to perineum involving the anal sphincter complex.
(3A)	Less than 50% of external anal sphincter (EAS) thickness torn.
(3B)	More than 50% EAS thickness torn.
(3C)	Both EAS and internal anal sphincter torn.
4 th degree perineal tear	Injury to perineum involving the anal sphincter complex (EAS and IAS) and anorectal mucosa.

3.1.3 Sample size

PS software was used to calculate the sample size with a level of significance set at ≥ 0.05 , power of study 80%, anticipated population proportion 90% and the estimated sample size (N) is 138. Taking into consideration an expected 20% drop out, the final sample size was 166 (83 for each group).

$$\begin{aligned}\text{Sample size} &= (N + \text{expected drop out}) \\ &= [(1.96/0.05)^2 \times 0.90 \times (1-0.90)] + 20\% N \\ &= 138 + 28 \\ &= 166\end{aligned}$$

Figure 3.2 Sample size calculation

3.1.4 Statistical analysis

SPSS Software version 22.0 was used to analyse each other datum obtained. Both descriptive statistics as well as frequency calculations were used when dealing with the presenting variables. The results were expressed as means, standard deviations (SD) or percentage. Comparison of binomial variables between groups was analyzed with a Chi-square test. It was then expressed as the odds ratio, OR (95% CI). Calculations to view the association between perineal tear was carried out using multivariate logistic regression as well as forward likelihood analysis, controlling for related variables. Calculations of the odd ratio (OR) and 95% confidence interval (CI) were done. It is deemed significant with a p value of < 0.05 .

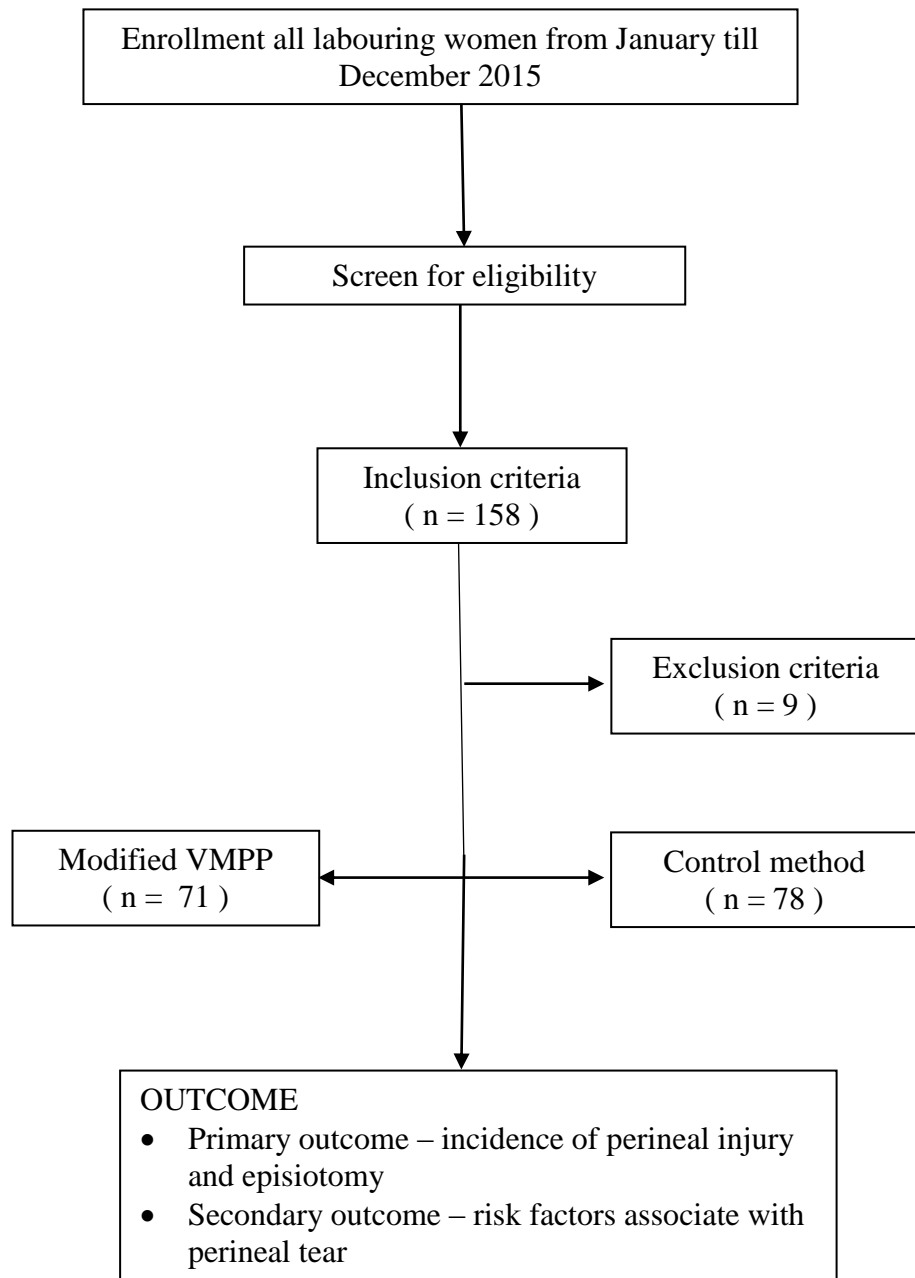


Figure 3.3 The study flow chart

CHAPTER FOUR

RESULT

There were 158 women who have been asked to partake in this study during this study period. However, 9 women were excluded due to instrumental deliveries. This left 71 women in intervention group and 78 women in control group.

The data was homogenous for both groups in term of age and gestation at delivery. The majority were primigravidae (91.9%), 12 women had previous history of caesarean section. Both groups have high BMI, overweight 25.82 kg/m² in the intervention group and obese 27.80 kg/m² in control group (p=0.45). There was no disparity in the duration of both groups during the second stage of labour (p=0.69). (Table 4.1)

Table 4.1 Baseline characteristics of the study subjects

	Modified VMPP	Control	P
	n=71	n=78	
	mean (SD)	mean (SD)	
Age (years)	25.06 (3.55)	26.04 (4.25)	0.31
Gestation (weeks)	39.06 (1.17)	39.07 (1.01)	0.12
Primigravida (n/%)	67 (94.4)	70 (89.7)	0.30
Previous LSCS (n/%)	4 (5.6)	8 (10.3)	0.30
BMI (kg/m ²)	25.82 (5.04)	27.80 (6.16)	0.45
Second stage (mins)	15.83 (9.81)	15.03 (9.98)	0.69

* Chi-square test and One-way ANOVA