**The postnatal effects of perineal trauma on maternal psychological and emotional wellbeing: a longitudinal study**

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**CONFLICT OF INTEREST**

All authors declare no conflict of interest.

**FUNDING**

This research was funded by a funded by a PhD scholarship from the University of Liverpool Institute of Psychology, Health and Society and the Liverpool Women’s Medical Education Fund.

**ABSTRACT**

**Objective**

To examine the postnatal psychological health and parenting adjustment of primiparous women experiencing perineal trauma

**Study Design**

Longitudinal cohort study assessing body image, perceptions of traumatic birth, psychological distress, perineal pain, impact upon parental tasks and mother-infant bonding at 6-12 weeks (*n=*103) and 6-10 months postnatally (*n*=91). Primiparous women were recruited following vaginal birth and perineal suturing in a UK-based maternity hospital. al. Comparisons made according to the objective classification of perineal trauma experienced; 1st/2nd degree tear, episiotomy, and Obstetric Anal Sphincter Injuries (OASI).

**Results**

At 6-12 weeks women with an episiotomy reported a more negative perception of their body image than those with OASI. Women with OASI or an episiotomy were more likely to have experienced birth as traumatic, and those with OASI reported more avoidance symptoms of post-traumatic stress and a greater negative impact on parenting tasks. At 6-10 months significantly more avoidance symptoms continued to be reported by those with OASI, whereas those with an episiotomy reported more anxiety related symptoms in general than those with OASI.

**Conclusions**

OASI, whilst associated with traumatic birth and some early parenting impacts, may not be linked to general negative psychological outcomes when specialist routine follow-up care is provided. Psychological impacts for women with episiotomy may merit further input than currently provided. Consideration should be given with regards to widening the access to postnatal perineal care by extending the criteria for specialist follow up beyond those sustaining OASI.

**KEYWORDS**

Anxiety; PTSD; Perineal trauma; Episiotomy; OASI

**ABBREVIATIONS**

OASI: Obstetric Anal Sphincter Injury

PTSD: Post-Traumatic Stress Disorder

**MAIN TEXT**

1. **INTRODUCTION**

Giving birth is an important life event (1,2). Birth may be experienced negatively or as a traumatic event, leading to symptoms of postnatal psychological distress (3,4,5). This can impact negatively upon relationships (6), and the cognitive development and overall wellbeing of the infant (7). Those affected may chose not to become pregnant again (8) or become anxious when they do (9). The latest MBRRACE-UK report has highlighted that mental health remains the leading cause of maternal death during the first postnatal year (10). It is important that we continue to identify any intrapartum factors contributing towards distress in the postpartum period.

Previous research has identified that some labour and birth events such as an assisted birth or emergency caesarean section may contribute towards a negative birth experience and postpartum psychological distress (11,12). Physical trauma to the vaginal walls and perineum is not uncommon during labour and birth. Approximately 90% of women experience some degree of perineal tear, with around 3-6% experiencing a more extensive tear (OASI) and 13-16% experiencing an episiotomy (13). Syntheses of the evidence surrounding women’s experiences of perineal trauma suggests a negative impact on birth experience and psychological health in the postpartum period, and this area has been under-researched (14). Qualitative research of women’s individual experiences of perineal trauma suggests women find the repair of the perineum distressing and experience anxieties surrounding future births (15).

Based on the scarcity of research in this area, a mixed methods longitudinal study of the impact of perineal trauma on postnatal psychological health was undertaken. The first paper from this study (16) showed that women with an OASI/episiotomy reported a more negative birth experience, a finding which persisted when other factors known to contribute towards negative birth experience were controlled for within the analysis (16). This highlighted perineal trauma as a significant contributor towards negative birth experience.

This paper presents an assessment of the effects of perineal trauma during childbirth on maternal psychological health and wellbeing at later time points; 6-12 weeks and 6-10 months postpartum. It was hypothesised that those with OASI would report a more negative impact than those with an episiotomy or 1st/2nd degree sutured tear due to its objective severity and physiological impact.

1. **MATERIALS AND METHODS**
	1. *Design*

The data presented formed part of the PEACH study (Psychological health and relationship Experiences After vaginal CHildbirth), a longitudinal cohort study exploring the effects of different degrees of perineal trauma on birth experience and psychological health in the postpartum.

* 1. *Setting*

The PEACH study was conducted in England within a tertiary maternity hospital containing both a midwifery led unit and delivery suite, facilitating over 9000 births per year. Recruitment took place over an 18-month period (between November 2014 and May 2016).

* 1. *Recruitment of Participants*

All women were provided with an antenatal information sheet at their booking appointment. Eligible women (16 years of age or over, who could speak and read English, had given birth for the first time vaginally to one live infant at term/³ 37 weeks’ gestation and who required perineal suturing) were approached postnatally by their midwife to take part. Recruits were consented by the researchers within 48 hours of giving birth and categorised into three comparison groups based on their most severe level of perineal trauma: OASI, 1st/2nd degree sutured tear and episiotomy. Those cared for by the perinatal mental health/safeguarding teams and those with infants admitted to high intensity neonatal care for more than 24 hours were not approached to take part. The sample was recruited consecutively during researcher availability. Ethical approval was obtained from the relevant local National Research Ethics Service (NRES) committee.

* 1. *Data collection*

Demographic and birth information were obtained from hospital records. Questionnaires were completed by phone/post at 6-12 weeks and 6-10 months postnatally and included the following measurements:

* + 1. **The Body Image Scale** (BIS: 16): 9 item questionnaire assessing feelings about bodily appearance/satisfaction during the last week. Responses are on a four-point scale from ‘not at all’ to ‘very much’. Higher scores indicate poorer body image. The scale has shown good internal reliability, and in the present study Cronbach’s alpha was 0.93.
		2. **Perceived impact of perineal pain/discomfort on parenting tasks** (PIPPP: developed by the authors: See Appendix A1): Informal exploratory discussions were undertaken with five new mothers attending a specialist perineal clinic at the recruitment site. This identified a series of tasks women felt were impacted upon and resulted in the creation of a simple 6-item questionnaire assessing perceived impact of perineal discomfort on parenting tasks. The scale was piloted with a separate subsample of women attending the same specialist clinic to check clarity and appropriateness and no issues were identified. Internal reliability was excellent with a Cronbach’s alpha of 0.91.
		3. **Mother and infant bonding: Mother and Infant Bonding Scale** (MIBS: 18): 8 item Likert scale assessing mother’s feelings towards her baby, rated on a 4-point scale from ‘very much’ to ‘not at all’. The scale has acceptable internal reliability of 0.66 (17) and in the present study Cronbach’s alpha was 0.73.
		4. **Perceptions of birth as a traumatic event**: According to the Diagnostic Statistical Manual (DSM IV-R: 19) which was employed in the design of the study, to fulfil criteria for a traumatic event, a woman must report perceiving threat of injury or death to herself or her baby during her labour/birth (criterion A1), and respond to this perception of threat with intense feelings of fear, helpless or horror (criterion A2) . Two yes/no questions corresponding to the A1 (threat) and A2 (appraisal) criterions were completed at 6-12 weeks. Women answering ‘yes’ to both were categorised as having experienced birth as traumatic.
		5. **Posttraumatic stress symptoms**: The Impact of Events Scale – Revised (IES-R:20)(6)(6) a series of 22 statements relating to feelings surrounding their childbirth experience. Responses were rated ‘0’(not at all) to ‘4’ (extremely). Internal reliability of the IES-R has been shown to be very high (6). Internal reliability in the present study for the total scale was 0.93 at 6-12 weeks and 0.92 at 6-10 months.
		6. **Anxiety and depression symptoms**: The Hospital Anxiety and Depression Scale (HADS:21) a 14-item measure with two subscales, one measuring symptoms of anxiety (HADS-A) and the other measuring symptoms of depression (HADS-D). Internal reliability for 6-12 weeks and 6-10 months was observed as 0.85 and 0.84 respectively for the HADS-A subscale and 0.78 and 0.79 respectively for the HADS-D subscale.
	1. *Statistical Analyses:*

Based on a medium effect size of 0.4, three comparison groups, four covariates, an error probability of 0.05 and power of 0.8 for a two-way ANCOVA, a minimum sample size of 97 was required. Analyses were carried out in SPSS (21). Separate between subjects’ one-way ANOVA and ANCOVA were carried out to assess differences in the above measures. Differences in demographic and birth characteristics were assessed using chi-squared tests for categorical variables and t-tests for continuous variables. A *p* value of ≤.05 was considered statistically significant.

1. **RESULTS**

Of the 202 women who consented to take part, 103 were followed up at 6-12 weeks (50.9%) and 90 at 6-10 months (44.5%). Overall, those who completed their follow-up were more likely to be married (p=0.001), educated to at least graduate level (p=0.001) and reside in less deprived areas (p<0.001). There were no other significant differences between responders and non-responders. Table 1 provides an overview of the demographic and birth characteristics at each time point and Table 2 provides an overview of the birth characteristics of the comparison groups. Table 3 details the psychological questionnaire findings and the group analyses for each outcome variable at both 6-12 weeks and 6-10 months, Table 4 provides an overview of the responses to the questions assessing fulfilment of DSM-IV criteria A1 and A2 for PTSD (assessment of the birth as a traumatic event). Analyses controlling for obstetric variables differing between groups, mode of birth, duration of labour and augmentation to ascertain the effects of perineal trauma after taking account of any impacts were completed.

[TABLES 1 THROUGH 4 HERE]

* 1. ***Group Comparisons on Psychological Variables at 6-12 weeks postpartum:***
		1. *Body Image:* Significant differences between the groups for perceived body image were found, (*Welch’s F*(2,62.999)=3.20, *p*=0.048). Specifically, those with an episiotomy reported a greater negative impact than those with an OASI (8.47±5.25 vs. 5.83±3.81,*p*=0.05). No other group comparisons were found to be significant.
		2. *Experiencing the birth as a traumatic event*: There were differences between the groups overall as to whether birth was perceived as a traumatic event, (Χ2(2,101)=26.39, *p*<0.001) with further analyses highlighting that a significantly larger proportion experienced an episiotomy (n=20) compared to those who did not experience an episiotomy (n=9) (Χ2(1,101)=9.81, *p*=0.002).
		3. *Symptoms of post-traumatic stress*: Compared to those with a 1st/2nd degree tear, those with an OASI (1.21 ±3.85 vs. 3.27±3.65, p=0.019) and those with an episiotomy (1.21±3.85 vs. 2.42±2.24, p=0.028) experienced significantly more symptoms of avoidance relating to their birth. When controlling for mode of birth and duration of labour, differences between the episiotomy and 1st/2nd degree tear groups were no longer significant (p>0.05). However, those with an OASI were still found to experience more avoidance related symptoms than those with a 1st/2nd degree tear (3.670, SE= 0.511 vs. 1.799, SE=0.556, *p*=0.024).
		4. *Impact of Perineal pain/discomfort on parenting tasks:* Significant differences with regards to the perceived impact of perineal pain/discomfort were found between the groups; (*Welch’s F*(2,26.924)=6.10, *p*=0.007). Those in the OASI group perceived more of a negative impact than those in the 1st/2nd degree tear group (9.99±10.98 vs 2.42±2.76, *p=*0.033). Those with an episiotomy also reported more of a negative impact than those in the 1st/2nd degree tear group (6.75±6.98 vs. 2.42±2.76, *p*=0.05). Differences between those with an OASI and those with an episiotomy not statistically significant (*p*>0.05).
	2. ***Group Comparisons on Psychological Variables at 6-10 months postpartum:***
		1. *Symptoms of post-traumatic stress*: Significant differences in IES-R avoidance sub-scale scores remained between the groups at 6-10 months postpartum (Welch’s F(2,55.892)=3.525, p=0.036). Women with an OASI continued to engage in more avoidance related behaviours with respect to their birth than those in the 1st/2nd degree tear group (3.40±3.88 vs. 1.31 ±1.95, *p*=0.033). No other group comparisons were significant.
		2. *Symptoms of Anxiety and Depression:* Significant differences in anxiety symptoms were found between the groups (F(2,87)=3.314, p=0.041). Those with an episiotomy reported experiencing significantly more anxiety related symptoms than those in the OASI group (7.79 vs. 5.23, *p*=0.039).
		3. No other group comparisons were significant.
1. **DISCUSSION**

To our knowledge, this is the first longitudinal study attempting to quantify the effects of different types of perineal trauma on psychological health in a sample of first-time mothers who had given birth vaginally.

At 6-12 weeks there were no differences between groups with regards to symptoms of anxiety or depression, or perceived bonding with the infant. Those with OASI or episiotomy were more likely to report their birth as traumatic compared to those with a 1st/2nd degree tear. Even after differences in obstetric variables were accounted for, the OASI group reported higher levels of birth-related avoidance symptoms, a key component of PTSD. This indicates that those who experienced OASI were needing to avoid distressing thoughts, images, people, or places that triggered birth related memories. Perceived impact on parenting tasks was also significantly affected in the OASI group. However, body image was most positive within the OASI group and significantly least positive with episiotomy. By 6-10 months the only differences remaining were that the OASI group continued to report higher avoidance symptoms and the episiotomy group higher anxiety symptoms.

The pattern of effects revealed are perhaps not those that would have been expected and demonstrate the complexity of the relationship between birth events, postnatal care, and postnatal mental health. Although the analysis sought to control for variation due to known contributing factors influencing birth experience, owing to the various combinations of birth events and obstetric interventions/complications that can exist, it is difficult to disentangle the effects that each event can have in isolation. For example, the episiotomy group included the largest proportion of assisted births, accounting for nearly 85% of the group compared to 30% of the OASI group and only 4% of the 1st/2nd degree tear group. Therefore, if the effects were due to mode of birth alone, we would expect to see the greatest impact in the episiotomy group and the least impact in the 1st/2nd degree tear group. However, such an easily understood pattern was not observed in this study, suggesting that the influencing factor(s) are less straightforward than simply the mode of birth experienced. If perineal trauma was the sole influencing factor, we may have expected to see those with an OASI reporting the largest impact across the measures, as was hypothesised, however this was also not the case.

The pattern of results may have been influenced by the care package provided within the hospital to those with OASI in the postnatal period, which is based on recommendations outlined by the Royal College of Obstetricians and Gynaecologists green top guideline (23). During the study period, this package of care was not routine routinely offered at all maternity services across the United Kingdom (24), and it may have alleviated some of the worries and anxieties within the OASI group that contribute to poor psychological wellbeing postnatally (25).

*Strengths and Limitations*

Many of the studies reporting on experiences of perineal trauma could be said to have an element of response bias due to the nature of the recruitment methods used. Such a response bias may have been avoided in this study as recruitment was driven by researcher availability and experience of the influencing birth event under investigation. Individuals were also recruited very early following their experiences of perineal trauma. However, the proportions of women participating were less than ideal and there was significant attrition over time. The factors influencing attrition are unclear and this may have introduced an element of response bias. Similarly, a sample of women who experienced perineal trauma that was not sutured were not recruited, and therefore not available for comparison. Subsequent research would benefit from larger sample sizes and the inclusion of women from more diverse ethnic and cultural backgrounds. Finally we did not include information on whether women had attended any antenatal education which included information on the possibility of tears or episiotomy. Interestingly recent research has indicated that preparation about possible complications and procedures may be psychologically beneficial whether or not procedures are subsequently required (7). This could be specifically explored in relation to perineal trauma.

1. **Conclusion**

These data suggest that major psychological difficulties following OASI are not inevitable and appropriate follow up care may alleviate OASI anxieties and issues relating to body image. It appears episiotomy has more negative implications than previously recognised. Given the data from this study and previous findings suggesting the importance of meeting care needs during the postnatal period (27) it may be beneficial to explore routine follow up for women after episiotomy.

**CONTRIBUTION TO AUTHORSHIP**

RM – Completed the work as part of a PhD funded by the University of Liverpool which included data collection, analysis, and the writing of this paper

GF – assisted with data analysis and assisted with the drafts and final version of this paper

PS – Supervised this work and assisted with data analysis, interpretation and assistance with drafts and final version of this paper

**REFERENCES**

1. Hall PL, Wittkowski A. An exploration of negative thoughts as a normal phenomenon after childbirth. J Midwifery Womens Health. 2006;51(5):321-330. doi:10.1016/j.jmwh.2006.03.007
2. Larkin P, Begley CM, Devane D. Women's experiences of labour and birth: an evolutionary concept analysis. Midwifery. 2009;25(2):e49-e59. doi:10.1016/j.midw.2007.07.010
3. Bell AF, Andersson E. The birth experience and women's postnatal depression: A systematic review. Midwifery. 2016;39:112-123. doi:10.1016/j.midw.2016.04.014
4. Ayers S, Pickering AD. Do women get posttraumatic stress disorder as a result of childbirth? A prospective study of incidence. Birth. 2001;28(2):111-118. doi:10.1046/j.1523-536x.2001.00111.x
5. Czarnocka J, Slade P. Prevalence and predictors of post-traumatic stress symptoms following childbirth. Br J Clin Psychol. 2000;39(1):35-51. doi:10.1348/014466500163095
6. Molloy E, Biggerstaff DL, Sidebotham P. A phenomenological exploration of parenting after birth trauma: Mothers perceptions of the first year. Women Birth. 2021;34(3):278-287. doi:10.1016/j.wombi.2020.03.004
7. Oyetunji A, Chandra P. Postpartum stress and infant outcome: A review of current literature. Psychiatry Res. 2020;284:112769. doi:10.1016/j.psychres.2020.112769
8. Fenech G, Thomson G. Tormented by ghosts from their past': a meta-synthesis to explore the psychosocial implications of a traumatic birth on maternal well-being. Midwifery. 2014;30(2):185-193. doi:10.1016/j.midw.2013.12.004
9. Greenfield M, Jomeen J, Glover L. "It Can't Be Like Last Time" - Choices Made in Early Pregnancy by Women Who Have Previously Experienced a Traumatic Birth. Front Psychol. 2019;10:56. Published 2019 Jan 25. doi:10.3389/fpsyg.2019.00056
10. Knight, M., Bunch, K., Tuffnell,. D, Patel, R., Shakespeare, J., Kotnis, R., Kenyon, S., & Kurinczuk, J. J. (Eds.). Saving lives, improving mothers’ care: Lessons learned to inform maternity care from the UK and Ireland confidential enquiries into maternal deaths and morbidity 2018-20.  [Internet]. United Kingdom: MBRRACE-UK; 2022. Available from: <https://www.npeu.ox.ac.uk/assets/downloads/mbrrace-uk/reports/maternal-report-2022/MBRRACE-UK_Maternal_MAIN_Report_2022_v10.pdf>
11. Ayers S, Bond R, Bertullies S, Wijma K. The aetiology of post-traumatic stress following childbirth: a meta-analysis and theoretical framework. Psychol Med. 2016;46(6):1121-1134. doi:10.1017/S0033291715002706
12. Ayers S, Joseph S, McKenzie-McHarg K, Slade P, Wijma K. Post-traumatic stress disorder following childbirth: current issues and recommendations for future research. J Psychosom Obstet Gynaecol. 2008;29(4):240-250. doi:10.1080/01674820802034631
13. Graham ID, Carroli G, Davies C, Medves JM. Episiotomy rates around the world: an update. Birth. 2005;32(3):219-223. doi:10.1111/j.0730-7659.2005.00373.x
14. Crookall R, Fowler G, Wood C, Slade P. A systematic mixed studies review of women's experiences of perineal trauma sustained during childbirth [published online ahead of print, 2018 May 23]. J Adv Nurs. 2018;10.1111/jan.13724. doi:10.1111/jan.13724
15. Priddis H, Schmied V, Dahlen H. Women's experiences following severe perineal trauma: a qualitative study. BMC Womens Health. 2014;14(1):32. Published 2014 Feb 21. doi:10.1186/1472-6874-14-32
16. Molyneux R, Fowler G, Slade P. The effects of perineal trauma on immediate self-reported birth experience in first-time mothers [published online ahead of print, 2021 May 19]. J Psychosom Obstet Gynaecol. 2021;1-7. doi:10.1080/0167482X.2021.1923689
17. Hopwood P, Fletcher I, Lee A, Al Ghazal S. A body image scale for use with cancer patients. Eur J Cancer. 2001;37(2):189-197. doi:10.1016/s0959-8049(00)00353-1
18. Taylor A, Atkins R, Kumar R, Adams D, Glover V. A new Mother-to-Infant Bonding Scale: links with early maternal mood. Arch Womens Ment Health. 2005;8(1):45-51. doi:10.1007/s00737-005-0074-z
19. DSM-IV. Washington DC: American Psychiatric Association; 1995.
20. Weiss DS, Marmar D. The impact of event scale-revised. In: Wilson J., Keane T., editors. Assessing psychological trauma and PTSD. New York: Guildford Press; 1997. p. 399–411.
21. Zigmond AS, Snaith RP. The hospital anxiety and depression scale. Acta Psychiatr Scand. 1983;67(6):361-370. doi:10.1111/j.1600-0447.1983.tb09716.x
22. IBM. SPSS statistics for Windows. Version 21.0. Armonk, NY: IBM; 2012
23. Third- and Fourth-degree Perineal Tears, Management (Green-top Guideline No. 29) [Internet]. 2022 [cited 18 March 2022]. Available from: <https://www.rcog.org.uk/guidance/browse-all-guidance/green-top-guidelines/third-and-fourth-degree-perineal-tears-management-green-top-guideline-no-29/>
24. Ismail SI. The management of obstetric anal sphincter injuries (OASIS): A national postal questionnaire survey in hospitals in the U.K. J Obstet Gynaecol. 2015;35(3):229-234. doi:10.3109/01443615.2014.954098
25. Priddis HS, Schmied V, Kettle C, Sneddon A, Dahlen HG. "A patchwork of services"--caring for women who sustain severe perineal trauma in New South Wales--from the perspective of women and midwives. BMC Pregnancy Childbirth. 2014;14:236. Published 2014 Jul 18. doi:10.1186/1471-2393-14-236
26. Soet JE, Brack GA, DiIorio C. Prevalence and predictors of women's experience of psychological trauma during childbirth. Birth. 2003;30(1):36-46. doi:10.1046/j.1523-536x.2003.00215.x
27. McLeish J, Harvey M, Redshaw M, Henderson J, Malouf R, Alderdice F. First-Time Mothers’ Expectations and Experiences of Postnatal Care in England. Qualitative Health Research. 2020;30(12):1876-1887. doi:10.1177/1049732320944141
28. Cross H, Krahe C, Spiby H, Slade P Do antenatal preparation and obstetric complications and procedures interact to affect birth experience and postnatal mental health? BMC Pregnancy and Childbirth.2023 23: 543 doi.org/10.1186/s12884-023-05846-5

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| --- |
| Table 1 *Demographic and Birth characteristics*  |
|  | 6-12 weeks  | 6-10 months  |
|  | All Participants (N=103) | All Participants (N=91) |
| Maternal age at birth, Mean(±SD)  | 29.00 (5.07)  | 29.51(4.75)  |
| Marital Status N (%) Married Cohabiting Single  | 56 (54.4) 33 (32) 14 (13.6)  | 48 (52.7) 34 (37.4) 9 (9.9)  |
| Ethnicity N (%) White Non-White  | 99 (96.1) 4 (3.9)  | 88 (96.7) 3 (3.3)  |
| Highest Education Level N (%) Up to GCSE/high school A-Level/Diploma UGD and higher  | 14 (13.6) 24 (23.3) 65 (63.1)  | 11 (12.1) 21 (23.1) 59 (64.8)  |
| Employed (%) YN  | 80 (77.6)23(22.3) | 77 (84.6)14 (15.4) |
| Gestation(weeks) Mean(±SD)  | 39.54 (1.24)  | 9.51(1.24)  |
| Onset of Labour N(%) Spontaneous Induced  | 70 (67.9) 33 (32.1)  | 60 (65.9) 31 (34.1)  |
| Duration of labour/birth (Hours)\*Mean (±SD)  | 8.36 (5.35)  | 8.55(±5.34)  |
| Augmentation of labour \*YN  | 6 (5.8) 97 (94.2)  | 7 (7.7) 84 (92.3)  |
| Type of Birth N (%) \*unassisted vaginal birth Assisted vaginal birth  | 60 (58.3) 43 (41.7)  | 53 (58.2) 38 (41.8)  |
| \*- significant difference between the three perineal status groups, *1values may not equal total group size due to missing data, 2 Non-Pharmacological= Hypnotherapy, TENs, Hydrotherapy, Attendant support, 3Pharmacological = Entonox, Diamorphine, Paracetamol, 4Anaesthetic = Epidural, Spinal, Pudendal, General Anaesthetic* |

 Table 2. Birth characteristics by comparison group

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | All (N=202)  | OASI (N=31) | 1st/2nd Degree (N=33) | Episiotomy (N=39) |
| Antenatal Risk Classification N (%)HighLow | 22 (21.4) 81 (78.6)  |  6 (19.4)25 (80.6) | 7 (21.2)26 (78.8) | 9 (23.1)30 (76.9) |
| Gestation in weeks, Mean (SD)  | 39.54 (±1.24)  | 39.55 (±1.12)  | 39.48 (±1.30)  | 39.59 (±1.29)  |
| Onset of Labour N (%) Spontaneous Induced  | 70 (67.9) 33 (32.1)  | 22 (70.9) 9 (29.1)  | 24 (72.7) 9 (27.3)  | 24 (61.5) 15 (38.5)  |
| Total duration of labour and birth in hours M(SD) \* | 8.36 (±5.35)  | 9.09 (±5.90)  | 7.12(±4.43)  | 9.13 (±4.91)  |
| Augmentation of labour \*YESNO  | 6 (5.8) 97 (94.2)  | 0 (0.0)31 (100.0)  | 0 (0.0)33 (100.0)  | 6 (15.4) 33 (84.6)  |
| Type of Birth N (%) \*Unassisted Vaginal Birth Assisted Vaginal Birth | 60 (58.3) 43 (41.7)  | 23 (74.2) 8 (25.8)  | 32 (97.0) 1 (3.0)  | 5 (12.8) 34 (87.2)  |
| \*- significant difference between the three perineal status groups |

Table 3. *Questionnaire and ANOVA results at 6-12 weeks and 6-10 months postpartum*

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | 6-12 weeks |  |  |  | 6-10 months |  |  |
|  | All 6-12 w(*n*=103) | All 6-10m(n=90) |  | OASI (*n*=31) | 1st/2nd degree tear(*n*=33) | Episiotomy (*n*=39) | *p*-value | Effect Size |  |  |  |  | *p*-value | *Effect Size* |
| BIS TotalNMean (±SD) | 1007.56(±5.42) | 878.42(±6.26) |  | 295.83(±3.81) | 338.00 (±6.51) | 388.47(±5.25) | .048 | 0.490 |  | 288.21(±6.31) | 258.84(±7.41) | 348.29(±5.43) | *>0.05* | *0.106* |
| IES-R TotalNMean (±SD)  | 1016.99(±7.74) | 906.46(±7.89) |  | 308.43(8.94) | 335.15 (±5.88) | 387.45(±8.03) | *>0.05* | 0.486 |  | 308.23(±9.60) | 264.38(±6.11) | 346.47(±7.27) | *>0.05* | *0.547* |
| IES-R IntrusionNMean (±SD) | 1013.26(±3.82) | 902.69(±3.13) |  | 303.27(±3.65) | 332.94(±3.47) | 383.53(±4.28) | *>0.05* | 0.127 |  | 302.93(±3.16.) | 261.69(±2.19) | 343.23(±3.61) | *>0.05* | *0.374* |
| IES-R Avoidance NMean (±SD)  | 1012.31(±2.78) | 902.32(±3.09) |  | 303.37(±3.85) | 331.21(±3.85) | 382.42(±2.24) | .004 | 0.471 |  | 303.40(±3.88) | 261.30(±1.95) | 342.15(±2.78) | .036 | 0.494 |
| IES-R HyperarousalNMean (±SD)  | 1011.31(±1.90) | 900.62(±0.87) |  | 301.67(±2.23) | 331.15(±1.91) | 381.29(±1.94) | *>0.05* | 0.149 |  | 300.67(±0.84) | 260.53(±0.95) | 340.65(±0.85) | *>0.05* | *0.063* |
| HADS AnxietyNMean(±SD) | 1005.45(±3.94) | 906.48(±4.13) |  | 294.41(±0.12) | 335.73(±3.97) | 386.00(±3.95) | *>0.05* | 0.412 |  | 305.23(±3.83) | 266.19(±4.33) | 347.79(±3.96) | .041 | 0.544 |
| HADS DepressionNMean (±SD) | 1014.29(±3.27) | 904.77(±3.36) |  | 303.87(±3.31) | 334.36(±3.36) | 384.63(±3.33) | *>0.05* | 0.170 |  | 303.83(±3.30) | 264.88(±3.17) | 345.50(±3.46) | *>0.05* | *0.389* |
| MIBS TotalNMean (±SD) | 981.49(±1.85) | 891.06(±1.47) |  | 281.51(±1.78) | 350.97(±1.38) | 351.00(±2.32) | *>0.05* | 0.176 |  | 301.46(±1.92) | 240.87(±1.22) | 331.00(±1.63) | *>0.05* | *0.198* |
| PIPP– Total NMean (±SD)  | 526.48(±8.16) | - |  | 179.99(±10.98) | 162.43(±2.76) | 206.75(±6.98) | .007 | 1.137 |  | - | - | - | - |  |
|  |  | --: differences not analyzed due to insufficient data. BIS: Body Image Scale; IES-R: Impact of Events Scale Revised; HADS: Hospital Anxiety and Depression Scale; MIBS; Mother and Infant Bonding Scale; VAS: Visual Analogue Scale; PIPP: Perceived Impact of Perineal discomfort on Parenting.  |

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| T*able 4 Frequencies for endorsement of DSM-IV A1 and A2 criteria for traumatic birth by perineal status group ( % in brackets)*  |
|  | OASI (n=31)  | 1st/2nd degree tear (*n=*32)  | Episiotomy (*n*=38) |
| A1(*Did you feel like yours or your baby’s life was at risk or that there was a risk of injury to yourself or your baby during labour/birth?)* Yes *n* (%)  | 18 (58.1)  | 5 (15.6)  | 29 (76.3)  |
| A2 *(Did you feel intense feelings of fear helplessness or horror during your labour/birth?)* Yes *n* (%) | 7 (22.6) | 3(9.4) | 13 (34.2) |
| A1 and A2 (together) *n* (%)  | 11 (35.5)  | 2 (6.3)  | 16 (42.1)  |

**Appendix A1: Perceived impact of perineal pain/discomfort on parenting tasks**

