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A Study On The Indispensability Of Weight Management For Working Female Athletes During And After The Postpartum Period: A Review

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Abstract
In this study, we examined whether weight management is necessary for working female athletes during and after pregnancy. Postpartum obesity, behavioral change, working women and sportspersons were the literature review topics. Pregnancy complications due to obesity, such as infertility, hypertension, gestational diabetes and neural tube defects in the child are associated with higher rates of early miscarriage and congenital defects. A woman's behavior changes during the postpartum period, including depression, stress and anxiety. For working women, maternity leave (over 12 weeks) positively impacts their vitality and mental health. It is common for elite athletes to become pregnant easily due to their healthy lifestyle, they deliver healthy babies, reduce their training during pregnancy, and resume sports usually occurs between 6 weeks to 12 weeks after giving birth. Women who are working, and especially those who are postpartum, must manage their weight during this period.

Keywords: Obesity, Behavioral change, Working Women, Postpartum period and Sportsperson

INTRODUCTION

A woman reaches maturity between the ages of 12 and 15. Menstruation is a process that happens when the uterine lining tears and blood flows out of the vagina. Every menstrual cycle, which typically lasts for one month, involves the ovary developing microscopic eggs for fertilization and the uterus producing lining to cushion the eggs. When a sperm cell fertilizes an egg, the lining of the uterus becomes thick and porous. This causes the pregnancy to begin. A foetus develops as a result of a process that occurs in a woman's uterus during pregnancy. The typical pregnancy process lasts nine months, however preterm pregnancy, sometimes known as taking less than seven months, can occur. There are 44 chromosomes in a female nucleus (X, X), and there are 44 chromosomes in a male nucleus (X, Y). There are two chromosomes in each daughter cell. A female zygote is created when it has two X chromosomes, and a male zygote is created when it has both X and Y chromosomes.

The period of pregnancy is divided into three trimesters, with each trimester lasting for 3 months. The first trimester, known as the conception period, begins at week 1 and ends at week 12. During the Second trimester, mothers can feel their baby's movements from week 13 to week 27. During the final three months, the infant gets ready for delivery, which typically begins between weeks 28 and 40.

Following the baby's birth, the postpartum period begins and typically lasts for around 8 weeks. The postpartum period begins right after the baby is born and lasts for 24 hours, also called the Acute Phase. Following the acute phase is the sub-acute postpartum period lasting up to 6 weeks. If a woman takes longer to return to her pre-pregnancy state, she enters the Delayed postpartum period which lasts up to 6 months.

[1] To investigate the effect of acupressure on postpartum low back pain (LBP), salivary cortisol, physical limitations and postpartum depression. Participants were 70 postpartum women who were randomly assigned to either an intervention (n = 35) or a control (n = 35) group. The intervention group received 10 acupressure sessions (1 session per day, 5 d per week). The control group received 10 sham acupressure sessions. Outcomes were assessed using a visual analog scale (LBP intensity), salivary cortisol values (LBP biomarker) and Chinese versions of the Roland-Morris Disability Questionnaire (daily activity limitations), Oswestry Disability Index (physical activity limitations) and the Edinburgh Postnatal Depression Scale (postpartum depression). Participants in the intervention group had significantly lower levels of LBP intensity, daily activity limitations, physical activity limitations and postpartum depression than those in the control group. There was no significant between-group difference in salivary cortisol. Acupressure may reduce postpartum LBP intensity and limitations in daily and physical activity, and alleviate postpartum depressive symptoms. Acupressure should be offered in postpartum care settings as an alternative treatment for postpartum women with LBP.

[2] For women with epilepsy (WWE), the postpartum period is a vulnerable time owing to medication alterations, disrupted sleep, increased stress and the challenges of breastfeeding. Sleep deprivation and the stress of having a new child can be challenging for WWE. Concerns over antiepileptic drugs (AEDs) in breast milk and sleep disruption associated with breastfeeding leads some WWE to discontinue breastfeeding. Adjustment of AEDs in the postpartum period can lead to difficulties in seizure control. Postpartum depression is increased in WWE, and patient education about newborn safety remains a concern. This article covers these important topics in postpartum WWE.

[3] Early diagnosis of an extrauterine pregnancy is important for safe and effective management. However, a pregnancy's location often cannot be easily determined with abnormal implantations or before 5-6 weeks' gestation. Multiple testing strategies exist to diagnose an abnormal pregnancy when location is unknown but caution needs to be used to avoid a false diagnosis. Medical treatment is optimal when an abnormal pregnancy is diagnosed early. Because most of these pregnancies are intrauterine additional testing to localize the pregnancy will allow the correct choice of therapy and avoids unnecessary exposure to a toxic therapy. This testing strategy should be reserved for patients with significant concern for ectopic pregnancy based on either risk factors or clinical findings. Overuse of this approach can lead to interruption of normal pregnancies.

[4] Pregnancy is often thought of as a time of happiness and anticipation however, for some women it can bring about significant emotional distress and feelings of vulnerability. The physiological changes that occur during pregnancy including hormonal fluctuations and alterations to the immune and physical systems can affect various parts of the body including the central nervous system (CNS). As a result, existing conditions may be intensified or new ones such as neurologic or psychiatric disorders may arise exposing women to increased risk of life-threatening conditions or suicide in the worst-case scenarios. Given the impact of pregnancy on CNS diseases it is crucial for healthcare providers and patients alike to be aware of these potential effects. By understanding how pregnancy may affect the CNS clinicians can take appropriate steps to ensure that women receive the care and support they need to minimize any negative outcomes for both the mother and the baby. This paper aims to review the available evidence on the impact of pregnancy on CNS diseases including mental health conditions from both the clinical and biomolecular perspectives. By illuminating this crucial subject this study fosters a delicate understanding within both patients and healthcare providers thereby paving the way for enhanced outcomes for women throughout their pregnancy journey and beyond.

[5] Gestational age in sheep can be closely predicted through ultrasonographic measurement of fetal bones when correlated to standardized fetal growth curves. However, these standardized curves do not account for factors that are known modulators of fetal growth such as maternal nutrition or health status. Despite being seasonal breeders, and studies reporting an effect of season on birth weight the influence of season on fetal growth has not been well characterized. In this study, we hypothesized that season of conception will affect fetal growth curves during mid-gestation and that pre-conceptional nutrition would have no effect. We investigated this by provisioning treatments of low, control, and high planes of nutrition during the lactation and flushing pre-conceptional periods to multiparous Dorset x Polypay and Dorset ewes over two seasons (the optimal breeding season [n = 97] and the suboptimal breeding season [n = 104]). Females were mated naturally with mating dates recorded, fetal biparietal diameter measured via ultrasound between gestational days 35-71 and newborn weights recorded at lambing. Pre-conceptional nutritional treatments did not affect fetal biparietal diameter. However, low vs. high nutrition in the pre-conceptional lactation (but not flushing) period resulted in reduced lamb birth weights ($P < 0.001$). Early fetal growth tended to be faster in the suboptimal breeding season than in the optimal

breeding season ($P < 0.061$) with lambs being heavier at birth in the optimal breeding season ($P < 0.001$). There was no effect of fetal sex or litter size on fetal biparietal diameter during the first half of pregnancy however both sex and litter size influenced lamb birth weight ($P < 0.001$) with males being heavier than females and singletons being heavier than twins and triplets. Mating date within the flushing period had a significant effect on lamb birth weight regardless of season and independent of treatment with ewes that conceived later in the flushing period having heavier lambs at birth ($P = 0.007$). These findings suggest that pre-conceptional under-or overnutrition resulting in substantial changes in body condition does not affect fetal growth during the first half of pregnancy. However, the reduction in lamb birth weight indicates that pre-conceptional maternal nutrition during the previous lactation period may affect fetal growth later in pregnancy.

OBESITY AND POSTPARTUM

Obesity is a chronic disease which leads to excessive body fat. It can be measured through BMI(Body mass index) and many more whereas, BMI is considered to be inaccurate as a person with lots of muscle and minimal body fat can have the same BMI as a person with obesity who has much less muscle[9]. For that reason some other methods were evolved to measure obesity accurately which includes waist circumference, waist-to-hip ratio, skin fold thickness, bioelectric Impedance, Underwater weighing(Through Densitometry), Air- Displacement Plethysmography, Dual-energy X-ray Absorption. Obesity has significant implications for preconception, pregnancy, and postpartum periods.

[6]Obesity in women of reproductive age is increasing in prevelance worldwide. Obesity reduces fertility and increases time taken to conceive and obesity-related comorbidities (such as type 2 diabetes and chronic hypertension) heighten the risk of adverse outcomes for mother and child if the woman becomes pregnant. Pregnant women who are obese are more likely to have early pregnancy loss and have increased risk of congenital fetal malformations, delivery of large for gestational-age infants, shoulder dystocia, spontaneous and medically indicated premature birth and stillbirth. Late pregnancy complications include gestational diabetes and pre-eclampsia both of which are associated with long-term morbidities postpartum. Women with obesity can also experience difficulties during labour and delivery and are more at risk of post-partum haemorrhage. Long-term health risks are associated with weight retention after delivery and inherent complications for the next pregnancy. The wellbeing of the next generation is also compromised. All these health issues could be avoided by prevention of obesity among women of reproductive age which should be viewed as a global public health priority. For women who are already obese renewed efforts should be made towards improved management during pregnancy especially of blood glucose and increased attention to post-partum weight management. Effective interventions tailored to ethnicity and culture are needed at each of these stages to improve the health of women and their children in the context of the global obesity epidemic.

[7] A healthy eating pattern is recommended for all life stages and is central to achieving optimal pregnancy outcomes and successful lactation. The preconception period is a critical window of time during which good nutritional status benefits both the mother and the offspring. The ongoing overweight and obesity epidemic, especially in conjunction with poor nutritional status presents maternal and infant health risks. Preconception and postpartum weight loss are routinely recommended in clinical practice. In this review we discuss the nutritional recommendations for healthy weight loss during these periods. Unhealthy weight loss during preconception and for lactating women can cause adverse maternal consequences that can impact the offspring.

[8] Postpartum obesity is a public health concern. There is a need to counsel women about their postpartum weight management accounting for various barriers they face. Limited literature in the Indian context underscored the need to develop the clinical practice guideline to be used by healthcare providers in Indian healthcare settings.The guideline was formulated by following the standardised methodology proposed by the National Health and Medical Research Council. Various steps such as identification of the patient population, assembly of the guideline development groups, identification of the key clinical questions, guideline development methods, grading the quality of evidence and recommendations and guideline translation were carried out to develop and validate the clinical practice recommendations. The evidence and consensus-based clinical practice guideline has been developed providing recommendations for key topics of interest for first-line treatment of obesity (lifestyle-related management). Recommendations focus on screening and initiating discussion with overweight and obese postpartum women as well as those who had normal pre-pregnancy body mass index but have retained excessive weight in the postpartum period. Recommendations highlight the evaluation and management of dietary, physical activity and breastfeeding behaviour. Recommendations also account for behavioural modification techniques to improve adherence to the prescribed weight management advice. Duration and frequency of follow-ups as well as the advice to be disseminated have also been discussed in the recommendations. The guideline provides clinical practice points that can be used by healthcare providers postpartum women and policymakers for opportunistic screening and management of postpartum obesity.

[9] Women with pre-pregnancy obesity have an increased risk of retaining or gaining weight postpartum and may benefit from weight loss treatment. However, evidence is lacking for weight loss strategies in women with BMIs in the higher obesity classes. A dietary treatment for postpartum weight loss resulted in a 10% weight reduction in lactating women with a mean BMI of 30 kg/m2. We aimed to examine the effects of this dietary treatment on changes in weight, markers of lipid and glucose metabolism, waist and hip circumference and postpartum weight retention (PPWR) in postpartum women with higher BMIs than tested previously.At baseline approximately 8 weeks postpartum, 29 women with a mean (SD) BMI = 40.0 (5.2) kg/m2 were randomised to a 12-week dietary treatment (n 14) or to a control treatment (n 15). Measurements were made at baseline and after 3 and 12 months. Data was analysed using mixed model. The mean weight change in the diet group was -2.3 (3.1) kg compared to 1.7 (3.1) kg in the control group after 3 months (P = 0.003) and -4.2 (5.6) kg compared to 4.8 (11.8) kg in the control group after 12 months (P = 0.02). The dietary treatment led to reduced waist circumference (P < 0.04) and PPWR (P < 0.01) compared to the control treatment at both time points. The treatment lowered fasting blood glucose at 12 months (P = 0.007) as the only effect on markers of lipid and glucose metabolism. The dietary treatment postpartum reduced weight and prevented weight retention or weight gain in women with obesity.
[10] To explore the experiences of women with obesity regarding self-care and the care provided by their families and health team after childbirth. A clinical qualitative study performed at the Postnatal Outpatient Clinic of Hospital da Mulher Universidade Estadual de Campinas, Brazil. The sample was selected using the saturation criteria with 16 women with obesity up to 6 months after childbirth. The analysis comprised three categories: 1) postnatal self-care 2) family support for woman after childbirth 3) postnatal health care service for women with obesity. Women with obesity need support from the health team and from their families after childbirth when they are overwhelmed by the exhausting care for the newborn. The present study reveals how important it is for health care professionals to broaden their perception and care provided after childbirth for women with obesity so they may experience an improvement in their quality of health and of life.

POSTPARTUM AND BEHAVIORAL CHANGE

In order to study behavioral change during postpartum period [11] The study was aimed at investigating the association between postpartum women's breastfeeding self-efficacy levels and their depression levels, social support levels and breastfeeding attitudes in early postpartum period. The cross-sectional study was carried out in Kirklareli in Turkey. The population of the study consisted of 398 women aged 15-49 in the first 42 days of the postpartum period who presented to eight family health centers. The study data were collected face-to-face using the Personal Information Form Breastfeeding Self-Efficacy Scale-Short Form (BSES-SF), Edinburgh Postnatal Depression Scale (EPDS), Multidimensional Scale of Perceived Social Support (MSPSS) and Breastfeeding Attitudes of the Evaluation Scale (BAES). The mean age of the participants was 28.61±5.72 (Min:18, Max: 44) and the mean score they obtained from the BSES-SF was 55.13±8.39. Statistically significant differences were detected between the participants' BSES-SF scores and age groups, employment status, perceived income level and the number of living children ($p < 0.05$). No statistically significant differences were detected between marital status, educational status and BSES-SF scores ($p > 0.05$). In the multivariate regression analysis adjusted according to the sociodemographic characteristics BAES, EPDS and MSPSS accounted for 48.3% of the BSES-SF. A negative association was found between BSES-SF scores and EPDS scores (β = -0.178, 95% CI:-0.349, -0.006) and a positive relation between the BAES scores (β = 0.194, 95% CI: 0.163, 0.226) and the MSPSS scores (β = 0.114, 95% CI: 0.037, 0.191). As the level of depression of women increases in the postpartum period the level of breastfeeding self-efficacy decreases. The breastfeeding self-efficacy increases as the level of social support increases and as the attitudes that drive breastfeeding behavior change positively.
[12] Excessive postpartum weight retention conveys risks for future metabolic diseases. Eating behaviors influence postpartum weight retention however the modifiable predictors of eating behaviors remain unclear. Using data from a three-arm, randomized controlled trial the purpose of this study was to examine the longitudinal associations of mental health (e.g., depressive symptoms) and behavior change skills (e.g., self-efficacy) with eating behaviors (i.e., compensatory restraint, routine restraint, emotional eating, and external eating) among women (N = 424) over 18-months postpartum. Results revealed that depressive symptoms perceived stress, healthy eating self-efficacy, overeating self-efficacy, self-weighing and problem-solving confidence were associated with one or more of the examined eating behaviors. Furthermore, depressive symptoms moderated the association between healthy eating self-efficacy and routine restraint. Perceived stress moderated the associations between healthy eating/overeating self-efficacy and emotional eating. The findings suggest that mental health and behavior change skills may serve as targets for interventions designed to improve postpartum women's eating behaviors.
[13] To determine the psychological and behavioural effects of the COVID-19 pandemic on a Canadian cohort of individuals during pregnancy and the postpartum period. In 2020, individuals between 20 weeks gestation and 3 months

postpartum receiving maternity care from an urban Canadian clinic were invited to complete a questionnaire. The purpose-built questionnaire used validated scales including the Medical Outcomes Study Social Support Survey (MOS), Depression, Anxiety and Stress Scale (DASS-21), Edinburgh Postnatal Depression Scale (EPDS) and questions from a SARS study. One hundred nine people completed the questionnaire (response rate, 55%) of whom 57% (n = 62) were postpartum. Most respondents (107, 98%) were married and had completed post-secondary education (104, 95%). Despite these protective factors moderate to severe levels of depression (22%), anxiety (19%) and stress (27%) were recorded using the DASS-21 and 25% of participants (26) had depression (score ≥11) using the EPDS. Despite high social support in all MOS domains (median scores 84-100) a majority of participants reported loneliness (69, 67%) and were nearly or totally housebound (65, 64%). About half of participants worried about themselves (50, 46.3%) or their baby (59, 54%) contracting COVID-19 while the majority postponed (80, 74.1%) and cancelled (79, 73.2%) prenatal appointments. Being homebound or feeling lonely / lacking support were significant risk factors for psychological distress (P = 0.02) whereas exercise and strong social support were protective (P < 0.05). Pregnant and postpartum individuals experienced moderate to severe depression, anxiety, and stress during the COVID-19 pandemic. Exercise and strong social support were protective. Health care provider enquiry of home circumstances and activity may identify individuals needing enhanced supports.

[14] A blended cognitive-behavioral intervention for postpartum depression (Be a Mom Coping with Depression) was developed consisting of the combination of seven face-to-face sessions (delivered through video call) with six online sessions in a web-based program. This study aimed to assess the intervention's feasibility, acceptability and preliminary effects on depressive symptoms. A single-arm pre- and post-test study was conducted and adult Portuguese women in the postpartum period (up to 12 months) with a clinical diagnosis of a major depressive episode were eligible to participate (n = 9). Participants completed self-report measures and were interviewed after completing the intervention. Eight participants completed the blended intervention. The recruitment rate was low but the adherence to treatment was high. Participants reported several advantages of this intervention and high levels of satisfaction. The blended intervention was found to be feasible and acceptable and a reduction on depressive symptoms was observed in our sample. These results support the conduction of a randomized controlled trial to assess the efficacy of this blended intervention and provided important information to proceed with the necessary modifications.

[15] Symptoms of depression, anxiety and stress in pregnant women are generally highest in the first trimester and then decrease throughout pregnancy reaching their lowest point in the postpartum period. Pregnant women are a high-risk population for mortality and mental health symptoms due to COVID-19. However, the extent to which the chronic stress of the COVID-19 pandemic alters the trajectory of depression, anxiety and stress symptoms in pregnant/postpartum women is unknown. Women (N=127) who were pregnant or who had given birth less than one month prior were recruited via online advertising during the COVID-19 pandemic. Participants were assessed up to three times during the pregnancy and at 1-month postpartum for depression (Edinburgh Postnatal Depression Scale), anxiety and stress (Depression, Anxiety, and Stress Scale-21). Random intercepts models examined symptom change over time as well as predictors of elevated postpartum psychopathology. On an average women completed their surveys at 8.5 weeks (first trimester), 21 weeks (second trimester), 32 weeks (third trimester) and 7-weeks postpartum. Women reported mild-moderate levels of depression, anxiety and stress throughout pregnancy. There was a significant change in symptoms of depression and anxiety over time which was best represented by a quadratic rather than linear trajectory: symptoms increased until week 23-25 and then decreased. Stress levels remained consistently elevated over time. Higher symptom levels at 1-month postpartum were predicted by younger age, lower social support and worry about going to a healthcare facility. Change in routine due to COVID-19 was not predictive of symptom trajectory from pregnancy to postpartum. During COVID-19, symptoms of depression and anxiety increased from early to mid-pregnancy but then declined slightly while stress levels remained elevated. Observed reductions in symptoms were small. Given the substantial persistent impact of perinatal distress and poor mental health on maternal and fetal health providers should be aware of heightened levels of these symptoms in pregnant women during large-scale external health stressors such as COVID-19 and should implement screening procedures to identify and appropriately intervene with at-risk women.

POSTPARTUM AND WORKING WOMEN

To study working women during post partum several studies were conducted [16] Postpartum depression (PD) among women if left untreated may result in long-term health and social consequences for them and their families. This cross-sectional study aimed to determine the factors contributing to PD among working mothers in Kuching, Sarawak, Malaysia. Systematic sampling was used to recruit working mothers who attended Kuching's maternal and child health clinics. They were interviewed with a validated translated questionnaire to obtain data on sociodemographics, health profiles and Edinburgh. Postnatal Depression Scale (EPDS) and postpartum symptoms. Data were analysed using IBM SPSS version 21.0. Out of the total 281 respondents, 15.3% of respondents had depression symptoms. Fatigue (42.7%), back or neck

pain (36.3%), breast discomfort (16.4%), dizziness (13.5%) and nipple irritation (11.0%) were the most common physical symptoms experienced by the mothers. Regression analysis showed that working mothers who exhibited higher scores of physical symptoms were 1.26 times more likely to develop PD (adjusted odd ratio 1.26, P < 0.01; 95% CI: 1.071, 1.487). Physical symptoms were the predictors of PD among working mothers.

[17] Poor lifestyle practices combined with excess weight gain and weight retention during the preconception, pregnancy and postpartum periods can increase health risks for mothers and their children. Little is known about how workplaces impact the health and well-being of women of child-bearing age, particularly across work roles and settings. This qualitative descriptive study explored the enablers and barriers to the healthy lifestyle practices and well-being of women of reproductive age within an Australian community services organisation by capturing the perspectives of both the women and workplace executives. Eleven interviews were conducted with executives (n = 12) and three focus groups and three interviews were conducted with women (n = 16). Data were thematically analysed, and six main themes were identified: blurring of the role and work environment, clarity and equity in policy and entitlements, the nature of community services work, individual responsibility for health, tiered levels of support and a management-driven culture of awareness and support. Barriers included high-stress roles, work targets, sedentary work behaviours, lack of clarity around policies, funding and the emotional labour associated with community services work. Hands-on leadership, open communication, work relationships, resourcing and manager training were identified as facilitators. While findings indicate agreement between executives and the women many executives focused on the challenges associated with pregnancy in the high-risk workplace environment and did not perceive specific barriers for those in non-frontline roles. Management education to generate an understanding of women's needs during this life stage and increased resourcing to facilitate workplace well-being would be beneficial.

[18] To examine associations of workplace leave length with breastfeeding initiation and continuation at 1, 2 and 3 months. We analyzed 2016 to 2018 data for 10 sites in the United States from the Pregnancy Risk Assessment Monitoring System, a site-specific, population-based surveillance system that samples women with a recent live birth 2 to 6 months after birth. Using multivariable logistic regression, we examined associations of leave length (< 3 vs ≥ 3 months) with breastfeeding outcomes. Among 12 301 postpartum women who planned to or had returned to the job they had during pregnancy, 42.1% reported taking unpaid leave, 37.5% reported paid leave, 18.2% reported both unpaid and paid leave and 2.2% reported no leave. Approximately two thirds (66.2%) of women reported taking less than 3 months of leave. Although 91.2% of women initiated breastfeeding, 81.2%, 72.1% and 65.3% of women continued breastfeeding at 1, 2 and 3 months respectively. Shorter leave length (< 3 months), whether paid or unpaid, was associated with lower prevalence of breastfeeding at 2 and 3 months compared with 3 or more months of leave. Women with less than 3 months of leave reported shorter breastfeeding duration than did women with 3 or more months of leave.

[19] Precipitating aspects of birth related trauma has been evidently playing a role in the Postpartum PTSD. Nearly 4% women go through Postpartum PTSD after birth. Women respond to incidents related to birth with extreme distress, helplessness or awfulness. Is birth trauma or fear of death perceived among working mothers during maternity or child birth? This study aims to understand the experience of birth trauma or birth associated Post Traumatic Stress Disorder in working woman in Indian population. In a non-experimental quantitative research design, women who had their baby within 2, 3, 4 and 5 years were recruited using purposive sampling to identify trauma experienced during maternity and child birth through City birth trauma scale. There is no significant difference in fear of death during child birth among working mothers. There was significant difference in Birth trauma among working mothers. High levels vigilance to precautionary measures to not to contract the COVID-19 virus in the hospital setting lead to higher distress among mothers (Liu et al. in Arch Gynecol Obstet 306(3), 687–697, 2021). Though PTSD symptoms were slightly higher in the participants, Birth related PTSD symptoms were not highly significant in the participant (Basu et al. in PLoS ONE 16, 2021). Fear of death or the reminiscence of the child birth experience was not differing among working women even with varied duration after child birth.

[20] Parental and maternity leave policies are a popular fringe benefit among childbearing employed women and a benefit employers frequently are required to offer. However, few rigorous evaluations of the effect of maternal leave on maternal health exist. Using a hybrid of the household and health production theories of Becker and Grossman and a sample of women identified from state vital statistics records, a nonlinear relationship between maternal postpartum health and time off work after childbirth was estimated. For women taking more than 12 weeks leave, time off work had a positive effect on vitality. With more than 15 weeks leave, time off work had a positive effect on maternal mental health and with more than 20 weeks leave, time off work had a positive effect on role function. Subjects' mental health scores were comparable and vitality scores slightly lower than age and gender-specific norms; 70% of women studied reported role function limitations. Findings suggest employed women experience problems in well-being at approximately seven months postpartum. Variables associated with improved health include: longer maternity leaves, fewer prenatal mental health

symptoms, fewer concurrent physical symptoms, more sleep, increased social support, increased job satisfaction, less physical exertion on the job, fewer infant symptoms and less difficulty arranging child care.

FEMALE ATHLETE AND POSTPARTUM PERIOD

[21] Increased participation and duration in sport has become commonplace for women with their involvement often including the transition to motherhood in the peak of their athletic careers. No rehabilitation models that assess the full spectrum of pregnancy to postpartum have been developed for women to assist in safe exercise progressions that reduce postpartum symptoms and optimize performance during the return to full activity. Referral to physical therapy both in the prenatal and postnatal period is currently not considered standard of care to reduce prevalence of symptoms such as musculoskeletal pain, diastasis recti and pelvic floor dysfunction which may ultimately interfere with physical activity and performance. This commentary presents a timeline and suggested progression for exercise participation to improve awareness of the musculoskeletal changes that occur after labor and delivery. The concepts covered may increase the understanding of how to manage pregnant and postpartum athletes from a musculoskeletal perspective and serve as a starting point for establishing appropriate and guided rehabilitation for safe return to sport after childbirth.

[22] To enhance knowledge on pregnancy and return to sport in the postpartum period in elite female athletes. 34 Norwegian elite athletes (33.1 years) and 34 active controls (31.5 years) were asked about training and competitive history, pregnancy-related issues, injuries, body dissatisfaction (BD), drive for thinness (DT), eating disorders (ED) and practical experiences through a questionnaire and interview. Independent samples T-tests or χ^2 tests for between-group differences and paired-samples T-tests and repeated measures analysis of variance for within group differences were used. No group differences in fertility problems, miscarriage, preterm birth or low birth weight were found. Both groups decreased training volume all trimesters and the first two postpartum periods compared with prepregnancy and more athletes returned to sport/exercise at week 0–6 postpartum. We found no group differences in complications during pregnancy and delivery but athletes reported fewer common complaints. Four athletes experienced stress fracture postpartum. Athletes had higher BD and DT postpartum, while controls reduced DT score. Number of athletes with clinical ED was reduced postpartum, while constant in controls. Athletes were not satisfied with advice related to strength training and nutrition during pregnancy. Elite athletes and active controls get pregnant easily, deliver healthy babies and decrease training during pregnancy and the first postpartum periods compared with prepregnancy. Most athletes and every third control returned to sport or exercise at week 0–6 postpartum. Athletes report stress fractures and increased BD and DT, but decreased ED postpartum. However, since relatively few athletes were included these findings need further investigation.

[23] Exercise is a critical protective factor for most chronic medical conditions and is strongly recommended during pregnancy and the postpartum period. The preventive health effect of exercise status (versus non-exercise) is similar to the effect of being a non-smoker (versus smoker). This makes lifelong exercise habits for the population critical for public health. Childbirth is a traumatic process (whether vaginal or by Caesarean section) that temporarily prevents usual exercise postpartum. The aim of this article is to describe the return to normal exercise in the months postpartum, including the additional challenge of commencing good exercise habits for those new mothers who were not regular exercisers before childbirth. Pelvic issues, regardless of mode of delivery, affect return to exercise postpartum. Development of musculoskeletal injuries is also a significant risk, for example De Quervain's tenosynovitis from new activities such as changing, bathing and nursing. Hormonal and postural changes, extra body weight and support networks all affect successful return to exercise.

[24] Returning to sport postpartum is becoming increasingly common for elite athletes. While policies to support women during this period are emerging, this remains an area of limited research. To date the lived postpartum experience of UK elite athletes as they returned to sport has not been explored. This qualitative study collated the experiences of 11 women via online interviews. Data was analysed using thematic analysis. Three key themes were generated from the data: 1) navigating the mother-athlete identity 2) personal support and inspiration and 3) systemic supports. Athletes must navigate their return to sport, both in terms of their changed identity and practical challenges associated with having a child. Seeing other women navigate this journey provided encouragement to athletes that they could do this. Findings also illustrated the role of the athletes' own sports community and wider organisations. Access to specific supports such as timelines for return to sport and nutritional advice positively impacted the athlete's postpartum return to sport, as did access to maternity leave policies which protected funding during the pregnancy and postpartum period. Moving forward, carrying out high-quality research to inform guidelines for elite athletes return to sport and developing national level maternity leave polices need to be seen as urgent priorities. This is to ensure that elite athletes are properly supported during the postpartum period and can resume their careers.

[25] Although a few studies on the experiences of mothering athletes have been conducted that investigate issues such a training patterns of elite and non-elite athletes, quality of life issues, and track and field athletes' return to competition after pregnancy (see Beilock, Feltz, & Pivarnik, 2001; Balague, Shaw, Vernacchia, & Yambor, 1995: Pederson, 2001),

none of these capture this experience from a critical feminist perspective. Therefore, the purpose of this study was to use a critical feminist framework to qualitatively explore the athletic experiences of elite distance runners who returned to competition after having children. The results of this study indicated that elite female distance runners who returned to a high level of competition after pregnancy experienced a transformative process as they negotiated their new roles as mothers and integrated this new lifestyle with both the social discourse surrounding motherhood and their own objectives to continue running at an elite level. Implications and theoretical connections between this research and future research are also provided.

DISCUSSION ON FINDINGS

Acupressure may reduce postpartum LBP intensity and limitations in diurnal and physical exertion, and palliate postpartum depressive symptoms. Acupressure should be offered in postpartum care settings as an indispensable treatment for postpartum women with LBP.(1) Careful consideration of individual case threat, test interpretation, and the damages of intervention versus expectant operation must take place, and discussion with educated providers should do when a opinion is in mistrustfulness. (3) The impact of gestation on CNS conditions, including internal health conditions, from both the clinical and biomolecular perspectives. Cases and healthcare providers, thereby paving the way for enhanced issues for women throughout their gestation trip and beyond. (4) Pre-conception under- or over-nutrition resulting in substantial changes in body condition doesn't affect fetal growth during the first half of gestation. The reduction in angel birth weight indicates that pre-conception motherly nutrition during the former lactation period may affect fetal growth latterly in gestation. (5) Health issues could be avoided by forestallment of rotundity among women of reproductive age, which should be viewed as a global public health precedence during gestation, especially of blood glucose, and increased attention to post-partum weight operation. Race and culture, are demanded at each of these stages to ameliorate the health of women and their children in the environment of the global rotundity epidemic. (6) The ongoing fat and rotundity epidemic, especially in confluence with poor nutritive status, presents motherly and infant health pitfalls weight loss during prepossession and for lactating women, can beget adverse motherly consequences that can impact the seed.(7) The salutary treatment postpartum reduced weight and averted weight retention or weight gain in women with rotundity (9) Healthcare professionals to broaden their perception and care after giving birth to women with rotundity so that they can ameliorate their quality of health and life.(10) Tone- efficacy increases as the position of social support increases and as the stations that drive breastfeeding geste change appreciatively. (11) Symptoms of depression and anxiety increased from early to mid-pregnancy but also declined slightly while stress situations remained elevated. Observed reductions in symptoms were small. (13)

CONCLUSION

Study findings are based on four key parameters: postpartum and obesity, behavioral change, and working women and athletes' experience. The risks of infertility, hypertension, gestational diabetes, thromboembolism, macrosomia, and spontaneous intrauterine demise during pregnancy are higher among obese women. It's important to remember that obese women are more likely to miscarry during pregnancy and to have congenital anomalies, including neural tube defects, during pregnancy. There are also observed behavioral changes during pregnancy and the postpartum phase, including elevated levels of stress, anxiety, and sadness. More than 12 weeks of leave has a good effect on vitality for working women; more than 15 weeks enhances maternal mental health; and more than 20 weeks enhances role function. Highly competitive athletes and active individuals typically have easy pregnancies, give birth to healthy children, cut back on training during pregnancy early in the postpartum period, and resume physical activity 0–6 weeks after giving birth.

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Ethical Clearance: NIL

Source of Finding: Self

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