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Programme:	BSc Health, Nutrition and Lifestyle / BA Physical Education		
Module:	Perspectives on Health & Physical Activity		
Module code:	BMPE6003	Contribution to Overall Module Assessment (%):	50%
Lecturer:	Alison Connaughton	Internal Verifier:	Chris Cashin
Assignment Title:	Essay: Identify a current issue or topic within the areas of sport, health, nutrition and physical education for investigation and critical review.	Word count (or equivalent):	3000
Submission deadline:	19th of November, 2021	Return date of provisional marks & written feedback:	Within 4 working term time weeks.
Submission method:	All written assessments, where practical and possible, must be submitted via Turnitin unless otherwise instructed by the Lecturer. (Please DO NOT put this assessment specification into Turnitin or it will match many similarities with other students' submissions.) Alternative submission method (if applicable): Late submission of the assessment will result in a late penalty mark. Penalties for late submission: Up to one week late, maximum mark of 40%. Over one week late, 0%. Only the Extenuating Circumstances Panel may approve a change to submission dates.		
Academic honesty / referencing:	Academic honesty is required. In the main body of your submission you must give credit to authors on whose research and ideas your work is based. Append to your submission a reference list that indicates the books, articles, etc. that you have used, cited or quoted in order to complete this assessment.		

Generic Assessment Criteria	Marks available	Marks awarded
1. Engagement with Literature Skills		
	20	
2. Knowledge and Understanding Skills		
	20	
3. Cognitive and Intellectual Skills		
	30	
4. Practical Application Skills		
	20	
5. Transferable Skills for Life and Professional Practice		
	10	

Assessment Mark (Assessment marks are subject to ratification at the Exam Board. These comments and marks are to give feedback on module work and are for guidance only until they are confirmed.)	Late Submission Penalties (tick if appropriate)	%
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Physical activity during pregnancy

World Health Organization defines physical activity as any bodily movement produced by skeletal muscles that requires energy expenditure (Physical activity, 2021). Exercise has many benefits in all phases of life including pregnancy. The UK Chief medical officer advises pregnant women to participate in 150 minutes of moderate intensity aerobic activity per week; for those who are un-active prior to pregnancy to start gradually and those who are active to continue but listen to your body and adapt (2021). Women who were physically active pre pregnancy are more likely to continue with their exercise routine during pregnancy (Karolina et al., 2014).

Pregnancy is associated with profound anatomical and physiological changes which may affect the musculoskeletal system, most commonly by weight gain. Increased weight will increase the forces on particular joints such as the hips and knees as the body changes. Posture changes can also cause low back pain and affect balance stability. Due to the increased levels of oestrogen and relaxin the possibility of strains and sprains during pregnancy is increased (Artal, 2003). Metabolic rate and heat production levels increase during pregnancy therefore only moderate intensity exercise should be performed to ensure core temperature doesn't increase more than 1.5 degrees (Artal, 2003). Cardiac output may increase by up to 40% by 24 weeks of gestation, after 30 weeks cardiac output is affected by the position of the body, advising mothers to lie on their left side (Cunningham, et al.). Indications show a decrease in pulmonary reserve and inability to exercise anaerobically (Artal, et al., 1986). Increased levels of progesterone decrease CO₂ by hyperventilation and increased tidal and minute volumes (Cunningham, et al, 2021). Increased levels also cause dilation of renal pelvises and ureters, increasing levels of urinary tract infections. During the second trimester blood pressure drops therefore it is important to avoid fast movement of positions for example sitting to standing as rapid movement may cause dizzy spells (Pregnancy and exercise-Better Health Channel, 2021).

Exercise intensity can be monitored using a method known as Borg's rating of Perceived Exertion (RPE) scale which measures how hard you feel your body is working (Pregnancy and exercise- Better Health Channel, 2021). The scale is a quick and simple numerical list which asks participants to rate their exertion on the scale during an activity, combining all feelings of physical stress and fatigue, the number gives an indication of the intensity of the activity allowing participants to know their limits (Williams, 2017).

The American college of Obstetricians and gynaecologists (ACOG) recognise that habits adopted during pregnancy could affect women's health for the rest of their lives. They also published recommendations that suggest that exercise can help prevent gestational diabetes and they promote exercise for sedentary women and those with medical or obstetric complications after a medical review and clearance (Artal, 2003). Before being encouraged to participate in exercise all pregnant women should know potential risks and be reviewed by the doctor and midwife.

Regular Physical activity is associated with reducing the risks of the following during pregnancy ((Anwar et al., 2017):

- Preeclampsia
- Gestational weight gain
- Gestational low blood pressure
- Urinary incontinence

- improvement of depressive and anxiety symptoms
- C- section birth
- Musculoskeletal discomfort
- prevention of postpartum weight retention
- varicose veins
- deep vein thrombosis

Other benefits include increased energy and fitness, preparation for labour demands and physical demand of motherhood, improve posture, circulation and sleep (Pregnancy and exercise - Better Health Channel, 2021).

Gestational diabetes is normally diagnosed in the second or third trimester of pregnancy which can be associated with both short-term and long-term health issues for mother and baby (Wang, 2016). Reports show that exercise improves glucose homeostasis and has an important role in the prevention and treatment of type 2 diabetes which is given similar pathogenesis of gestational diabetes. It is also shown that woman who are active before and during pregnancy have a significantly lower risk of developing gestational diabetes, as exercise provides an alternative pathway of glucose uptake to insulin activated transport and training has been associated with upregulating antioxidant agents in pregnant woman (Wang, 2016).

A report found those who started exercising earlier in pregnancy had fewer discomforts in their later pregnancy which suggests that participating in aerobic exercise does not adversely affect birthweight or other maternal outcomes (Sternfeld, 1995).

When exercising the body produces extra endorphins which are hormones that elevate your mood (Pregnancy and exercise - Better Health Channel, 2021). Women are more vulnerable to mental health problems during pregnancy due to the intense psychological and biological changes that occur. A tested hypothesis showed that there is an association between anxiety, depression and perceived stress in pregnant woman and the absence of physical activity increases symptoms. Evidence shows that participants in aerobic exercise programmes have reduced occurrence symptoms of depression during pregnancy (Takahasi, et al., 2013). The study also shows that lower levels of education and socioeconomic status are factors associated with reduced levels of physical activity during pregnancy. Tendai et al found that symptoms of depression were stable during pregnancy, but psychological wellbeing decreased among those who were inactive during the first trimester of pregnancy, physical activity has been shown to provide mood stability (Takahasi, et al., 2013).

A study carried out by Fieril et al., (2014) showed that exercise was perceived to have a positive impact on body and mind during pregnancy, several women that took part in the study experienced that regular exercise relieved various somatic problems of pregnancy including nausea, fatigue and headaches. They also stated it has a positive impact on sleep and reduced stress and general pain.

Walking, Swimming, cycling, light jogging, light muscle strengthening exercises including pelvic floor, prenatal yoga and pilates are all safe activities to participate in during pregnancy. All weight-bearing exercises should be performed on level surfaces to avoid sprains or any muscular or joint damage (Pregnancy and exercise- Better Health Channel, 2021). It is important to start with low intensity if inactive before pregnancy and build up to moderate intensity (Pregnancy and exercise- Better Health Channel, 2021). Exercises that

involve lying on your back for longer than a few minutes should be avoided as the weight of the baby bump presses on the main blood vessel that brings blood back to the heart which can then cause low blood pressure and dizziness (Exercising in pregnancy is good for you and your baby! Have a look at which types of exercise you can do, 2021). Other things to be cautious of include:

- Raised body temperature.
- Don't exercise to the point of exhaustion.
- stay hydrated
- avoid lifting heavy weights.
- perform controlled stretching and avoid over-extending
- Don't increase intensity
- Avoid contact or collision sport
- High altitude training over 2000m

Yoga is one of the best form of physical activity during pregnancy as it builds strength, balance and keeps muscles limber, reduces blood pressure and helps you focus on breathing which will help during birth (Larasati, Nasrudin and Budu, 2019). Prenatal Pilates is also a good way to build up strength and balance. Findings suggest that practicing yoga during pregnancy boosts self-confidence and reduces discomforts that may come with pregnancy and that it may facilitate self-efficacy during both active and second stage of labour. The study shows "after engaging in yoga exercises, most of the pregnant women did not experience uterine contractions and their heartbeat remained in a safe range" (Sun, et al., 2010).

Swimming is soothing and a low impact physical activity which can be an easy way to build up core strength and aerobic capacity, as it does not put stress on the body it is an approved way to exercise during In Vitro fertilization (IVF) (Pregnancy Swimming: Safety, Benefits, and Tips, 2021). Studies by Watson, et al indicate that baseline fetal heart rate may be less affected by swimming of cycling.

Stationary upright cycling is a low impact and non-weight bearing sport recommended by the ACOG as research show that fetal heart rate and temperature are not negatively affected when cycling for 30 minutes at a maternal heart rate around (O'Neill, 2021).

Moderate weight training with free weights and weight machines has been shown to be safe with no negative effects on fetus as there are minimal heart rate changes from baseline and the fetal wakefulness is increased (Cunningham, et al 2021). The ACOG recommend conditioning exercises to help maintain posture and low back pain.

It is advised not to start running during pregnancy if you didn't pre pregnancy though it is ok to continue if you are a regular runner as there is no evidence that running will cause harm to baby (2021). Stretching exercises should also be avoided during pregnancy due to laxity of the support structures unless pathological adaptive shortenings are present (Pregnancy and exercise- Better Health Channel, 2021).

There are no studies that show a relationship between physical activity and birth weight, though Clapp et al (2021) found that "recreational athletes who exercised 6 days a week for 1 hour has shorter lengths of gestation, and light babies compared to women whom stopped exercising at 28 weeks". However another study that carried out a 3 month exercise program on pregnant women showed that limitations on physical and social functioning increased over the course of pregnancy though improvements were seen in most domains of the health-related quality of life questionnaires (Arizabaleta, 2010).

During the First trimester it is important to listen to your body as the volume of blood pumped out by the heart is increased by week 5-6 gestation which can cause increased heart rate and dizziness. If able to continue with exercise during the first weeks of pregnancy it can help you feel more energized and add benefits to both mum and baby (2021).

As baby bump grows in the second trimester you should have a consistent workout routine and start to refrain from lying on your back. Blood volume is 30-40 percent higher than pre-pregnancy levels which mean more oxygen to the muscles, resulting in more energy than the first trimester. It is a good time to start pregnancy core exercises that engage the transverse abdominis and pelvic floor (2021). Pelvic floor muscles support the bladder, uterus and bowel which can be weakened by pregnancy. If pelvic floor muscles are weak you may leak urine especially when coughing, sneezing or straining (Exercise in pregnancy, 2021). The American journal of Obstetrics and Gynecology found that mums that's had a C-section were less likely to perform pelvic floor exercises even though pregnancy itself affects the pelvic floor muscles (Atrial, 2003). Pelvic floor exercises can be completed on the medicine ball by squeezing and lifting muscles and holding up to 10 seconds, relaxing and repeating as it is important to learn how to relax and turn on the muscles (2021). It is important to stretch, stabilize and strengthen all muscles around the core, as the top of the pelvis tilts forward during pregnancy the upper spine tends to round (2021). While focusing on core exercises concentrate on drawing the belly button towards the spine, breathe out while pulling in your belly, hold for 10 seconds, breathe and repeat (Exercise in pregnancy, 2021). It is common for women to experience a condition known as diastasis recti abdominis which is a painless splitting of the abdominal muscle at the midline (Exercise in pregnancy 2021). If undetected it can lead to low back pain, poor posture, muscle imbalances, bloating and incontinence. (2021). Exercises that add extra pressure on the belly tissues such as sit-ups and planks should be avoided and concentrate on transverse ab exercises safe for diastasis recti (2021).

During the third trimester it is important to take extra care as the relaxin hormone allows your pelvis and rib cage to expand which creates loose joints which may cause injury. As posture changes it can cause loss of balance. Though these changes occur you don't have to decrease intensity of exercise just listen to the ability of your body and healthcare practitioner, ensure you warm up and cool down correctly before and after exercise (2021). Core exercises should now be done seated, on an angle or on all fours with a focus on the pelvic floor and transverse abdominals. When exercising it is essential to fuel your body with nutrition and to stay hydrated, women who are pregnant are recommended to drink 6-8oz of water for every 15 minutes moderate intensity exercise is performed (Pregnancy and exercise- Better Health Channel, 2021).

During physical activity you must stop immediately if experiencing any of the following symptoms: (Exercise in pregnancy, 2014).

- Fatigue
- shortness of breath
- headache
- heart palpitations or chest pain
- dizziness or feeling faint
- calf pain or swelling
- vaginal bleeding
- deep back, pubic or pelvic pain
- amniotic fluid leakage

After pregnancy if there are no complications with labour and no surgery, as long as it has been cleared with the doctor and midwife according to the ACOG pelvic floor exercises are encouraged straight away postpartum (Atral, 2003). During the first few weeks postpartum the body goes through many changes therefore a delicate time for the body so ease gently back into exercise (2021). It is important to strengthen pelvic floor and core in postnatal recovery as muscle will be weak and lose. A study stated that pelvic floor exercises should be recommended to all woman in the 1st trimester of pregnancy as they help prevent pelvic floor disfunction as vaginal delivery affects pelvic floor structures and their function in a negative way (Bozkurt, et, al. 2014). Those who have a C-section must take extra cation when exercising 6-8 weeks postpartum.

There may be reasons why some pregnant women may not want to participate in physical activity such as history or symptoms of preterm labour or miscarriage, placental problems, heart and lung problems and high blood pressure though there is no significant evidence that physical activity has a negative effect on these issues (Why Would You Choose to Not Exercise in Pregnancy?, 2021). However woman who have a history or high risk of preterm labour should be advised to reduce physical activity in the second and third trimester (Atral, 2003).

Pregnancy is a good opportunity for woman to maintain or form health lifestyles, hose with uncomplicated pregnancies should be encouraged to engage in their normal physical activity routine as pregnancy should not be confined. Physical activity has minimal risks and confirmed benefits for most pregnant woman and the same cardiovascular benefits as nonpregnant women. It is import for Woman to seek advice for their midwives, doctor or NHS pregnancy activities which gives guidance on what exercises to do and ensure they take part in a pregnancy workout routine. There is a lack of specific information recommending type, intensity and duration of exercise.

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