

Physical activity during pregnancy & postpartum: SA context



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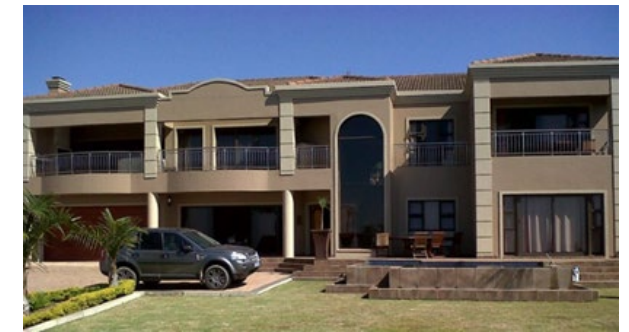
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Introduction





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Rzeczpospolita Polska



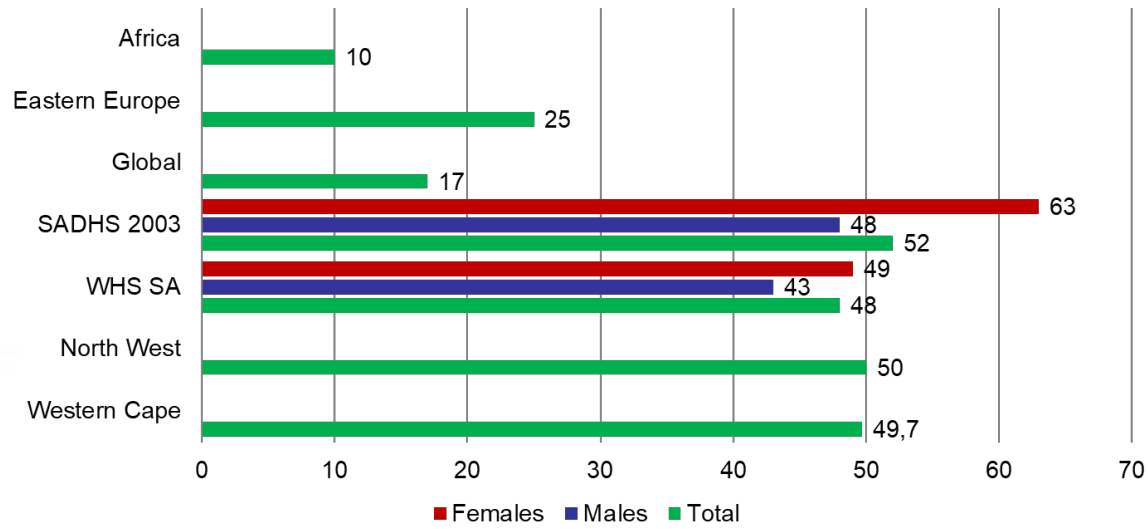
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52% of South Africans are insufficiently active!

30% Lifestyle disease

HIV & TB high prevalence



Joubert et al., 2007. SAJSM. 97:725-773.
 South African Demographic and Health Survey 2003. Pretoria: Department of Health
 Steyn et al., 2004. Ethn Dis. 14:233-242.
 Kruger et al. 2003. Cardiovasc J S Afr. 14:16-23.

Maternal mortality in South Africa

- Lowest rate in Africa – 113/100 000 vs 7/100 000 in the UK
- Causes of maternal deaths: ([Maternal Health Indicators](#), 2020)
 - HIC related infections
 - Obstetric haemorrhage
 - Hypertensive disorders of pregnancy
- 76% attend at least 4 antenatal clinics
- 96% deliver in healthcare facilities – skilled birth attendant
- 90% live within 7 km of a health facility, yet struggle to reach the facility in time
- Patients with complications do not reach higher levels of care in good time
- Overcrowding when they do reach an appropriate facility
- Abuse during pregnancy often reported
- Good health outcomes associated with higher education, housing and jobs



NATIONAL AGYW STATISTICS: TEEN PREGNANCY



IN SOUTH AFRICA, MORE THAN... **30%** OF TEENAGE GIRLS FALL PREGNANT⁵



AND MORE THAN 65% OF THESE PREGNANCIES ARE UNPLANNED⁶

5. Mkhize, S. & Review of Teenage Pregnancy in South Africa – Experiences, of Learning, and Knowledge and Access to Sexual & Reproductive Health Services. Cape Town: Pathways to Sexual Health, 2013.
6. Aducci, C.J., Kopp, A., Mande, M., Lee, S., O'Connell, S., Gagnon, J., High rate of unintended pregnancy in the context of increased family planning and HIV care services in South Africa. BMC Health Serv Res 2015, 15:142. <http://dx.doi.org/10.1186/s12916-015-0407-2>

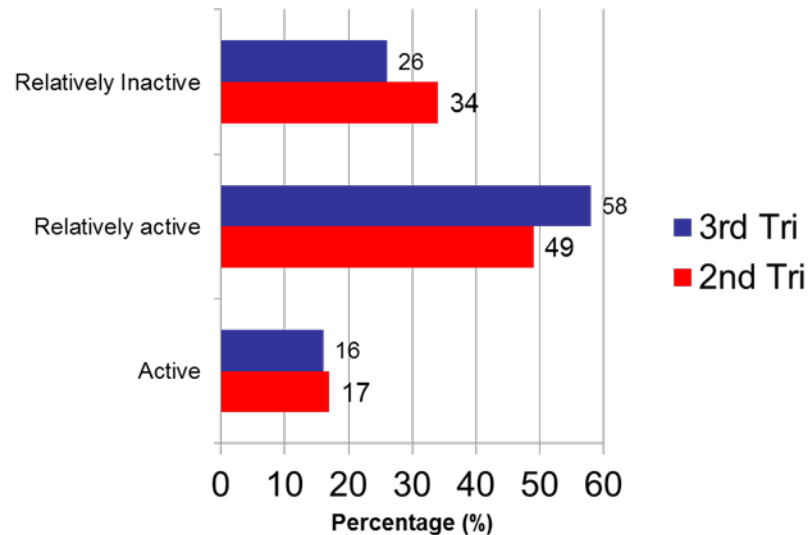


Maternal health care in South Africa

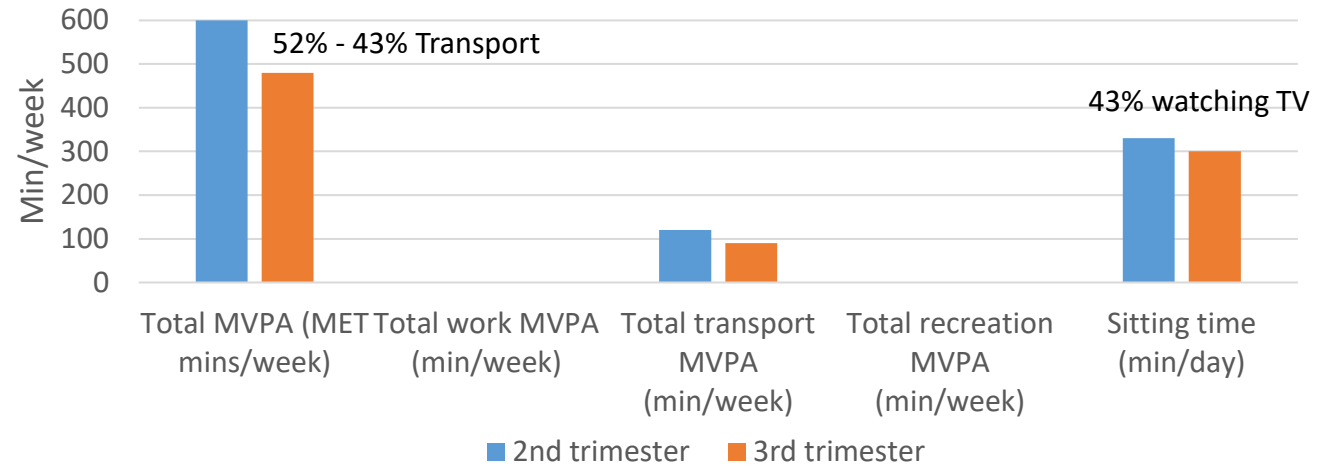
- Public Health & Private Health care (*Basic antenatal care+, WHO*)
- 80% dependent on Public health care
- WHO guidelines implemented in 2017
- 4 visits changed to 8 visits
- Majority unexplained still births in the final 4-weeks
- Pregnancy tests on females visiting health care clinics – screening
- Scheduled visits to clinics during each trimester – Nurse
- <12, 20, 26, 30, 36, 38, 40 weeks
- Ultrasound 24 weeks

How active are pregnant SA women?

Changes in PA from 2nd to 3rd trimester
Tswane women (EPAQ2)



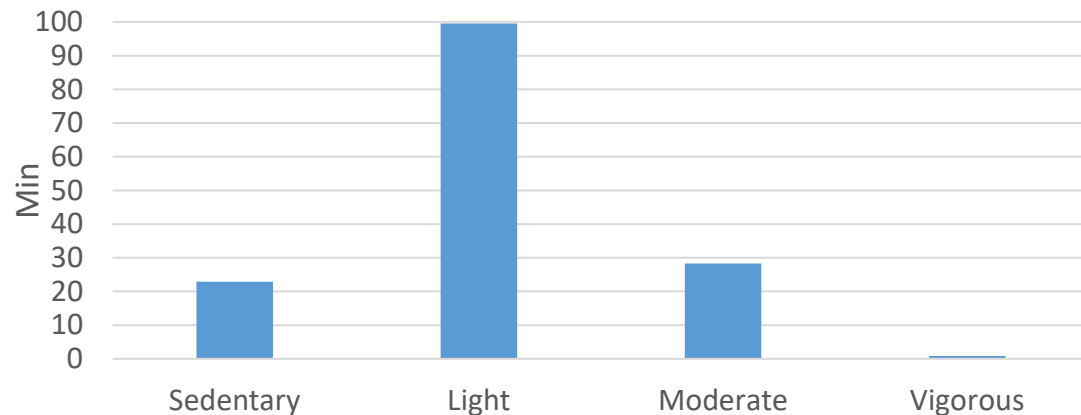
Change in PA from 2nd to 3rd trimester
Soweto women (GPAQ)



Brunette et al. 2012
Watson, et al. 2017.

How active are pregnant SA women?

PA during pregnancy – Buffalo City(PPAQ)



- Across SA subjective measure instruments
- Cross-sectional design
- Sedentary time = TV watching
- PA = Active transport
- Majority of participants = Secondary school qualification
- 65% inactive prior to pregnancy
- Obesity prevalent in pregnancy
- Information from TV



Okafor & Goon, 2020

Perceptions of PA during pregnancy

Pregnant women

- Considered physical activity to be beneficial
- Messages to “take it easy” vs “being too lazy”
- Time to “rest & relax”
- Barriers reported:
 - tiredness,
 - morning sickness,
 - interrupted sleep
 - lack of time and money
 - lack of knowledge/information
 - Cultural beliefs/ take it easy.



Perceptions of PA during pregnancy

Medical practitioners

- Small portion is aware of the ACOG guidelines for exercise
- Did not know that strength training is allowed
- 24% did not refer to exercise professionals
- 39% will refer to an exercise professional
- Belief exercise is good for pregnant women
- Did not have the knowledge to prescribe exercise

Biokineticist – The exercise for health expert



The health professional trained in preventing and managing health, wellness and optimal performance through the application of exercise interventions

- 4-year professional degree at a University
- 485 credits
- About 20 – 40 students per university
- 12 universities training Biokineticists
- Scope of the profession is:
 - Clinical populations and special populations (Pregnancy, Geriatrics, ID, children, Depression)
 - Orthopaedic diseases and injury-related conditions
 - Wellness
- Final phase rehabilitation and return to play

- HPCSA registration as independent practitioner = Health Professions Council of South Africa (HPCSA)
- Professional organization – Biokinetics Association of South Africa - International



Biokineticist training

- Theory
- 1000 hours practical under supervision
- 200 h in year 1 & 2;
- 350 in the 3rd year and
- 450 in the 4th year
- Exercise physiology and applied exercise physiology
- Biomechanics
- Motor learning and control
- Physical activity epidemiology
- Anatomy
- Exercise testing and prescription
- Musculoskeletal system assessments
- ROM
- Proprioceptive testing and flexibility
- Isokinetics testing
- Cardiorespiratory function/Fitness
- Research project



Other persons prescribing exercise to pregnant women

- Personal trainers – theory & practical workshop
- Specialised programs by Biokineticists ([Fit 4 Two](#))
- Nurses (Midwifery students)



Longitudinal habitual activity patterns during pregnancy

Longitudinal Habitual activity patterns & Maternal- and foetal Health outcomes

- 350 Pregnancies over three years

To determine longitudinal changes in activity energy expenditure by objective measurement and maternal weight throughout pregnancy

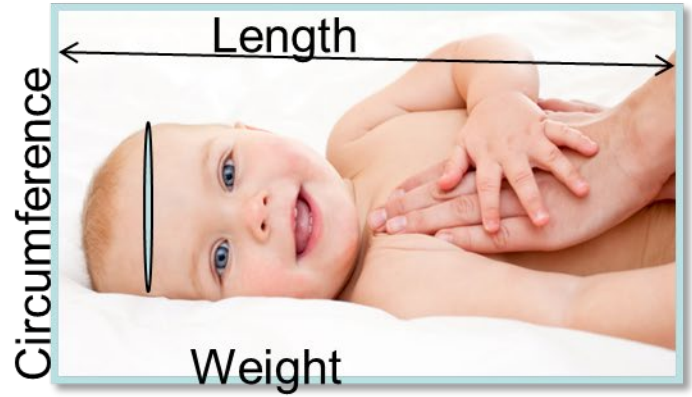
Measurements

- Pre-pregnancy; Weeks 9-12; 20 – 24; 34 – 38 & 12-weeks post-partum
- Demographic & Health information (Income, Education, Smoking, ect.)
- Questionnaires (QOL, Nausea & Vomiting, Edinburg Depression scale, PPAQ)
- Objective physical activity (combined Heart rate and accelerometry - ActiHeart)
- Gait analyses and energy expenditure
- Ethical approval was obtained from the Ethics committee of the NWU

Measurements



Activity Energy Expenditure
Physical activity level
Counts/min
7 consecutive days.



Measurements

Edinburgh Postnatal Depression Scale¹ (EPDS)

Name: _____ Address: _____
 Your Date of Birth: _____
 Baby's Date of Birth: _____ Phone: _____

As you are pregnant or have recently had a baby, we would like to know how you are feeling. Please check the answer that comes closest to how you have felt **IN THE PAST 7 DAYS**, not just how you feel today.

Here is an example, already completed.

- I have felt happy:
- Yes, all the time
 - Yes, most of the time
 - No, not very often
 - No, not at all
- This would mean: "I have felt happy most of the time" during the past week. Please complete the other questions in the same way.

In the past 7 days:

- | | |
|---|--|
| <p>1. I have been able to laugh and see the funny side of things</p> <ul style="list-style-type: none"> <input type="checkbox"/> As much as I always could <input type="checkbox"/> Not quite so much now <input type="checkbox"/> Definitely not so much now <input type="checkbox"/> Not at all <p>2. I have looked forward with enjoyment to things</p> <ul style="list-style-type: none"> <input type="checkbox"/> As much as I ever did <input type="checkbox"/> Rather less than I used to <input type="checkbox"/> Definitely less than I used to <input type="checkbox"/> Hardly at all <p>3. I have blamed myself unnecessarily when things went wrong</p> <ul style="list-style-type: none"> <input type="checkbox"/> Yes, most of the time <input type="checkbox"/> Yes, some of the time <input type="checkbox"/> Not very often <input type="checkbox"/> No, never <p>4. I have been anxious or worried for no good reason</p> <ul style="list-style-type: none"> <input type="checkbox"/> No, not at all <input type="checkbox"/> Hardly ever <input type="checkbox"/> Yes, sometimes <input type="checkbox"/> Yes, very often <p>5. I have felt scared or panicky for no very good reason</p> <ul style="list-style-type: none"> <input type="checkbox"/> Yes, quite a lot <input type="checkbox"/> Yes, sometimes <input type="checkbox"/> No, not much <input type="checkbox"/> No, not at all | <p>6. Things have been getting on top of me</p> <ul style="list-style-type: none"> <input type="checkbox"/> Yes, most of the time I haven't been able to cope at all <input type="checkbox"/> Yes, sometimes I haven't been coping as well as usual <input type="checkbox"/> No, most of the time I have coped quite well <input type="checkbox"/> No, I have been coping as well as ever <p>7. I have been so unhappy that I have had difficulty sleeping</p> <ul style="list-style-type: none"> <input type="checkbox"/> Yes, most of the time <input type="checkbox"/> Yes, sometimes <input type="checkbox"/> Not very often <input type="checkbox"/> No, not at all <p>8. I have felt sad or miserable</p> <ul style="list-style-type: none"> <input type="checkbox"/> Yes, most of the time <input type="checkbox"/> Yes, quite often <input type="checkbox"/> Not very often <input type="checkbox"/> No, not at all <p>9. I have been so unhappy that I have been crying</p> <ul style="list-style-type: none"> <input type="checkbox"/> Yes, most of the time <input type="checkbox"/> Yes, quite often <input type="checkbox"/> Only occasionally <input type="checkbox"/> No, never <p>10. The thought of harming myself has occurred to me</p> <ul style="list-style-type: none"> <input type="checkbox"/> Yes, quite often <input type="checkbox"/> Sometimes <input type="checkbox"/> Hardly ever <input type="checkbox"/> Never |
|---|--|

Administered/Reviewed by _____ Date _____

¹Source: Cox, J.L., Holden, J.M., and Sagovsky, R. 1987. Detection of postnatal depression: Development of the 10-item Edinburgh Postnatal Depression Scale. *British Journal of Psychiatry* 150:782-786.

²Source: K. L. Wisner, B. L. Parry, C. M. Piontek, Postpartum Depression N Engl J Med vol. 347, No 3, July 18, 2002, 194-199

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Pregnancy Physical Activity Questionnaire



Instructions:
 Please use an ordinary No. 2 pencil. Fill in the circles completely. The Question will be read by a machine so if you need to change your answer, erase the incorrect mark **completely**. If you have comments, please write them on the back of the questionnaire.

Example: During this trimester, when you are NOT at work, how much time do you usually spend:

If you take care of your mom for 2 hours each day, then your answer should look like this...



E1. Taking care of an older adult

- None
- Less than 1/2 hour per day
- 1/2 to almost 1 hour per day
- 1 to almost 2 hours per day
- 2 to almost 3 hours per day
- 3 or more hours per day



It is very important you tell us about yourself honestly. There are no right or wrong answers. We just want to know about the things you are doing during this trimester.

1. Today's Date: / /

2. What was the first day of your last period? / / I don't know

3. When is your baby due? / / I don't know

During this trimester, when you are NOT at work, how much time do you usually spend:

- | | |
|--|---|
| <p>4. Preparing meals (cook, set table, wash dishes)</p> <ul style="list-style-type: none"> <input type="radio"/> None <input type="radio"/> Less than 1/2 hour per day <input type="radio"/> 1/2 to almost 1 hour per day <input type="radio"/> 1 to almost 2 hours per day <input type="radio"/> 2 to almost 3 hours per day <input type="radio"/> 3 or more hours per day | <p>5. Dressing, bathing, feeding children while you are sitting</p> <ul style="list-style-type: none"> <input type="radio"/> None <input type="radio"/> Less than 1/2 hour per day <input type="radio"/> 1/2 to almost 1 hour per day <input type="radio"/> 1 to almost 2 hours per day <input type="radio"/> 2 to almost 3 hours per day <input type="radio"/> 3 or more hours per day |
|--|---|



NVP QOL questionnaire

Full name: Health related Quality of Life for Nausea and Vomiting during pregnancy

Domain 1: Physical symptoms and aggravating factors

none of the time -- ----- all of the time

1 7

Nausea
 Sick to your stomach
 Vomiting
 Dry-heaves
 Poor appetite
 Symptoms worse in evening
 Not eaten for longer than you would like
 Worse when exposed to certain smells
 Worse when exposed to certain foods

Domain 2: Fatigue

Fatigue
 Worn-out, lack of energy
 Exhausted
 Tired

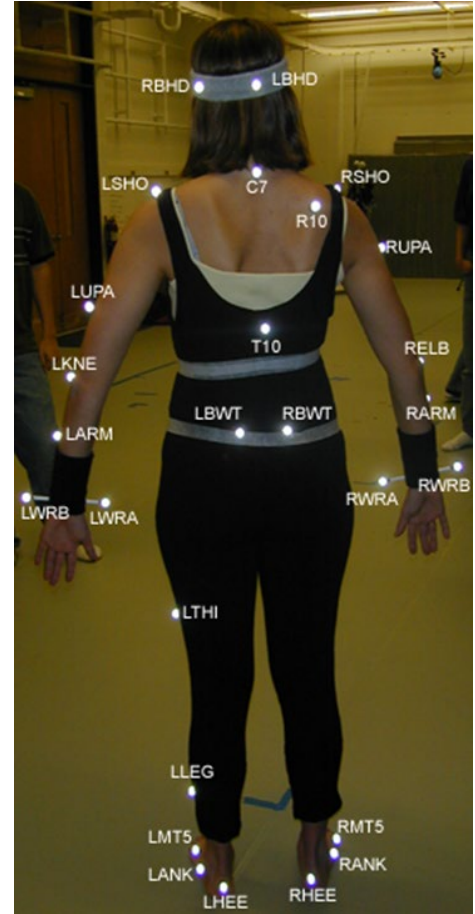
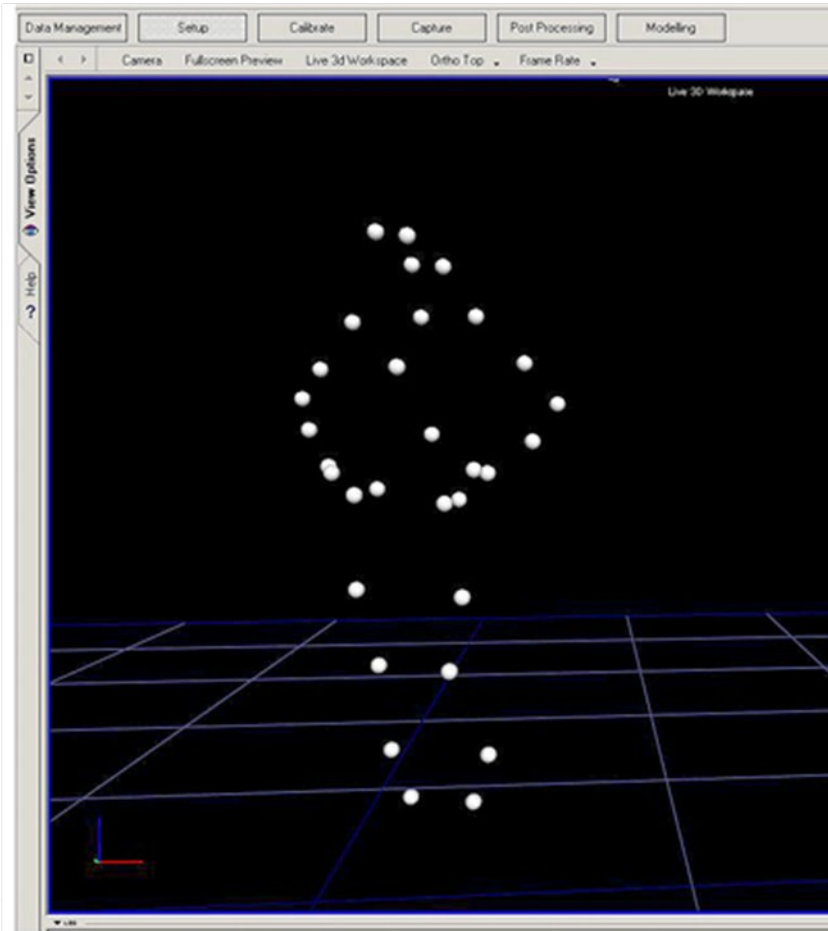
Domain 3: Emotions

Emotional
 Less interested in sex
 Downhearted, blue, sad, unhappy, depressed, gloomy
 Frustrated
 Fed up with being sick
 Reassured that your symptoms are part of normal pregnancy
 Can't enjoy your pregnancy

Domain 4: Limitations

Everything is an effort
 Accomplished less than you would like
 Took longer to get things done than usual
 Difficult or took extra effort to perform, and/or limited in types of work and other activities
 Difficulty maintaining your normal social activities with family, friends, neighbours, or social groups
 Rely on your partner to do things that you would normally do for family
 Difficulty looking after home
 Difficulty shopping for food
 Difficulty preparing or cooking meals
 Cut down on amount of time you spent at work or other activities

Measurements



Low-resourced communities



The South African Timeline - Defined...



Present Time ----- Right Now ----- Now ----- Just Now ----- Now Now



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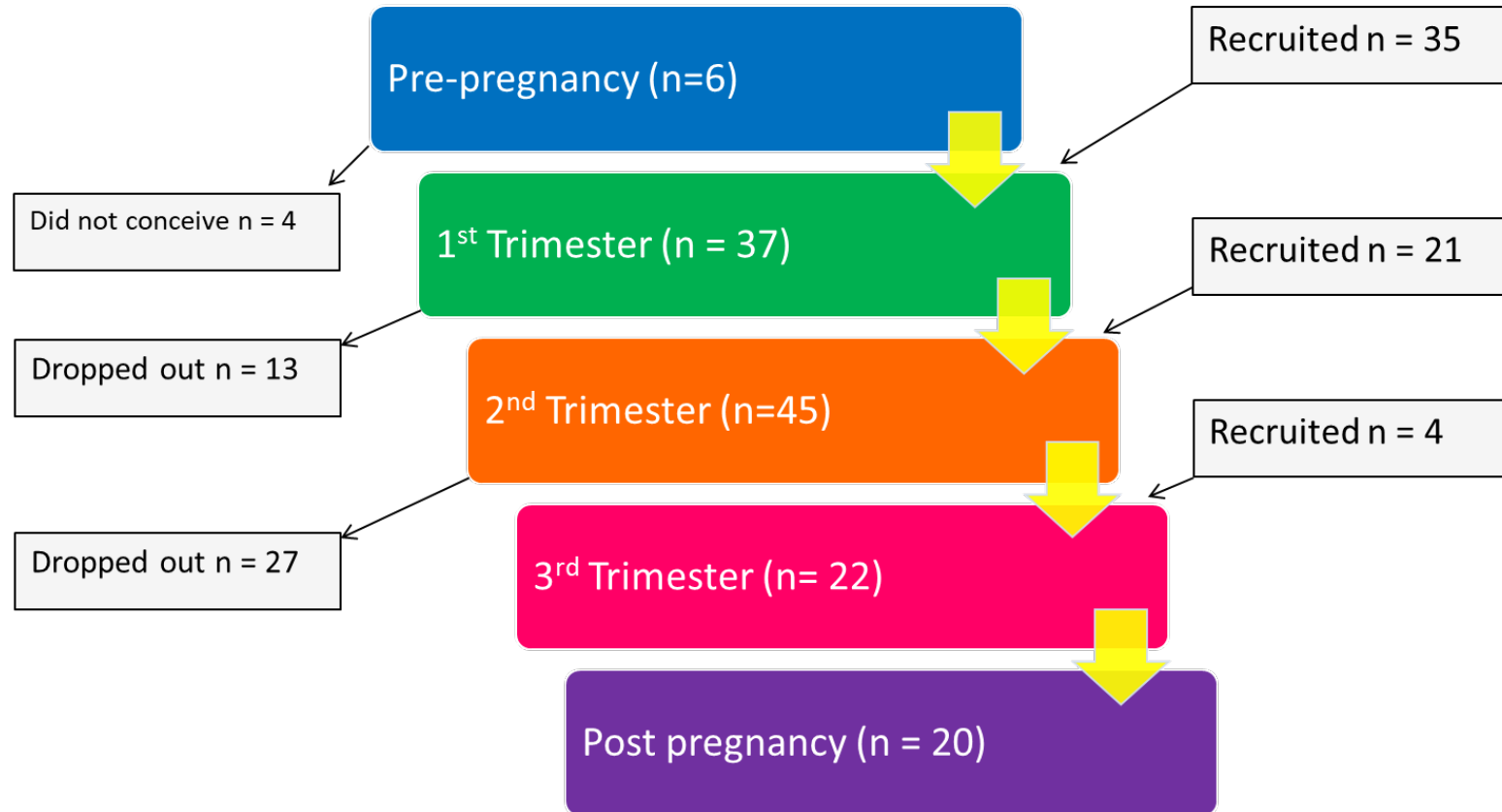
NAWA



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Results

Participants (N= 69)



Results

Age (years): 28 ± 5 years

60% unmarried

Socio economic status

Ethnicity

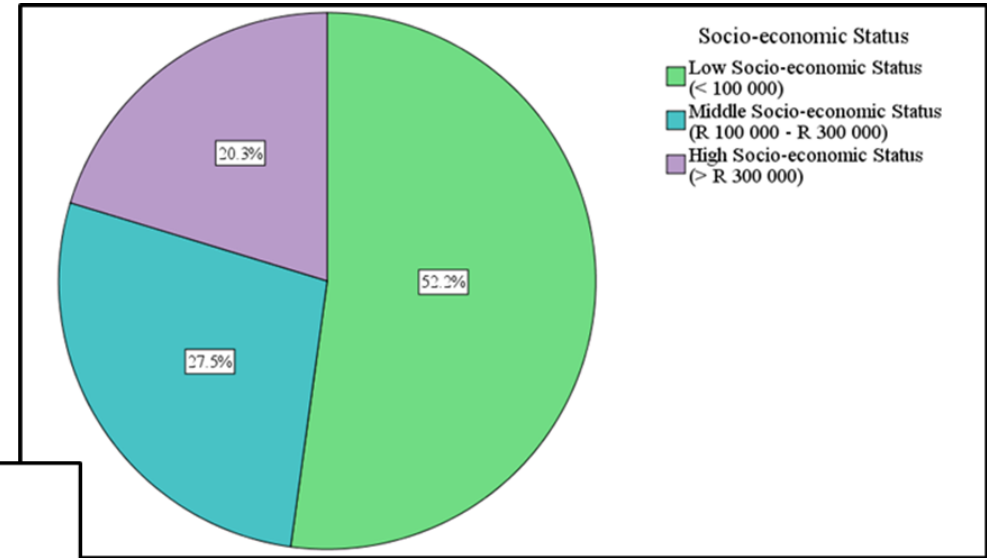


Figure 2: Socio-economic status distribution

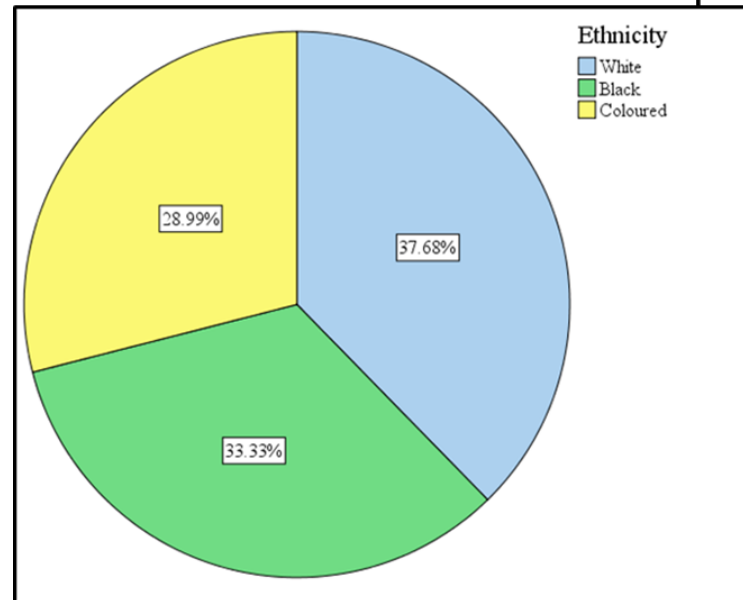


Figure 3: Distribution of ethnicity

Results

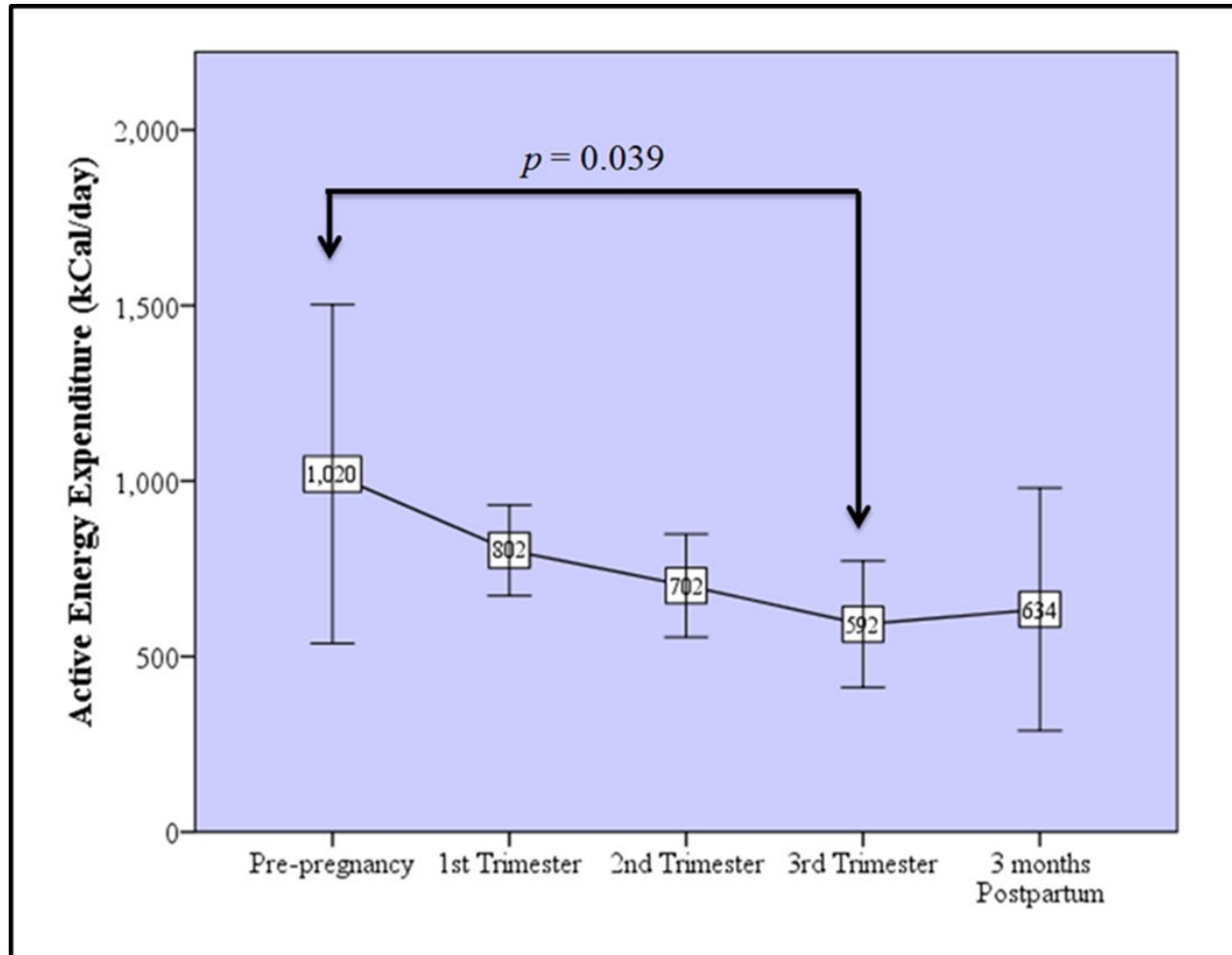
Variables	Pre Pg	1 st Tri	2 nd Tri	3 rd Tri	Post Pg
Gestation (weeks)	-	11.1 ± 2.0	21.7 ± 2.6	30.0 ± 2.0	14.3 ± 2.1
Weight (kg)	63.1 ± 13.2	68.74 ± 13.75	73.7 ± 14.7	76.8 ± 15.3	75.2 ± 18.7
BMI (kg/m ²)	23.5 ± 3.7	25.8 ± 4.9	28.5 ± 5.8	28.7 ± 6.8	26.9 ± 6.8
AEE (kCal)	1019 ± 592	803 ± 384	702 ± 471	592 ± 383	634 ± 520
Activity (cpm).	32 ± 21	29 ± 15.4	26.1 ± 9.6	24.1 ± 10.1	23.2 ± 8.3
PAL	1.82 ± 0.41	1.73 ± 0.3	1.63 ± 0.34	1.54 ± 0.28	1.56 ± 0.5
Days worn (n)	5.8 ± 0.4	5.4 ± 1.3	6.4 ± 0.5	5.7 ± 0.9	5.4 ± 0.9

Results

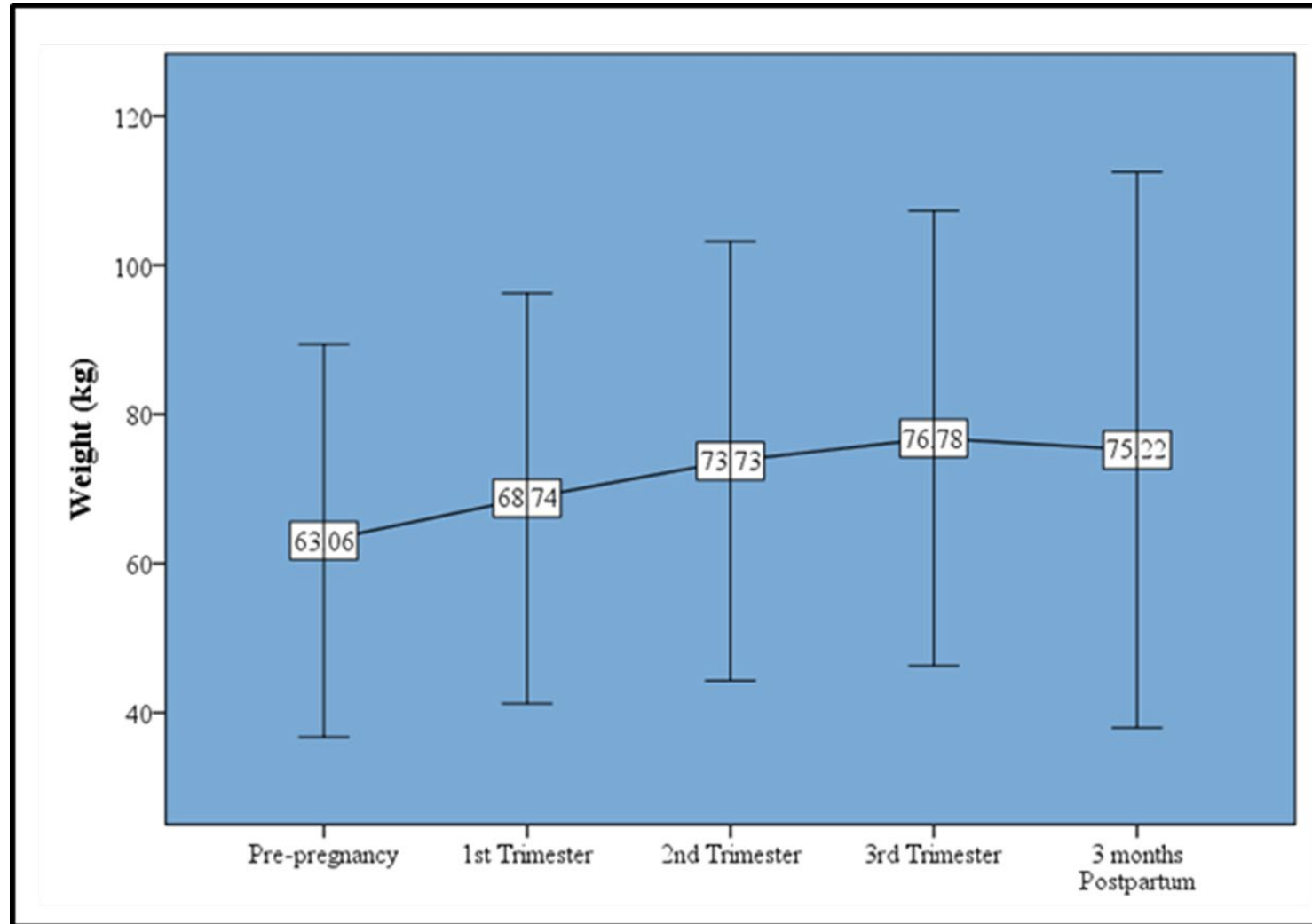
Variable	N	Minimum	Maximum	Mean \pm SD
Gestational age at birth	20	36	43	39.1 \pm 1.5
Birth weight (kg)	20	1.6	4.42	3.12 \pm 0.56
Birth length (cm)	20	44.0	58.0	48.5 \pm 3.2
Ponderal Index (kg/m ³)	20	13.07	39.97	27.74 \pm 5.63
Head circumference (cm)	20	32	38	35.1 \pm 1.4

75% C-sections; 50% Boys

Results



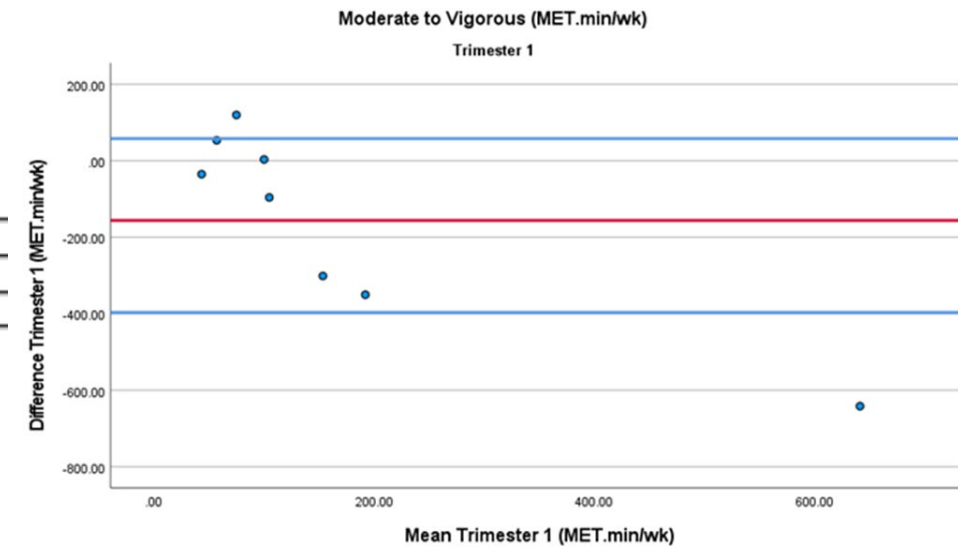
Results



Results

Variable	Trimester 1		Trimester 2		Trimester 3	
	Mean	SD	Mean	SD	Mean	SD
ActiHeart (MET.min/wk)						
Sedentary	1118.29	195.36	1140.24	271.84	1237.21	173.68
Light	214.43	120.12	190.77	141.19	150.63	116.44
Moderate	105.16	88.28	78	81.39	52.21	61.38
Vigorous	2.83	5.73	0.73	2.03	0.47	1.64
Total	1402.81	233.71	1409.75	206.24	1440.52	0.9
PPAQ (MET.min/wk)						
Sedentary	7.85	4.25	7.41	4.63	11.07	4.48
Light	135.36	69.1	197.42	136.36	98.89	59.30
Moderate	266.47	309.55	522.24	589.47	258.57	156.77
Vigorous	13.78	22.22	21.15	33.17	4.38	7.47
Total	4765.42	5881.61	11034.66	15026.22	4602.36	3576.5
Number of weeks pregnant	11.19	2	21.72	2.54	30.4	2.24
Days ActiHeart was worn	5.38	1.34	5.29	1.42	5.74	0.82

PA = physical activity, SD = standard deviation, MET.min/wk = MET minutes per week



Discussion

- physical activity levels decreases from pre pre-pregnancy to post-partum
- largest decrease between first and third trimester (11%)
- Three months post partum 10% less than in 1st trimester
- Weight gain within normal range (13 kg),
- Weight retention at 3 month postpartum still high (12 kg).

The implication

- Insufficient levels of physical activity during pregnancy with a large weight retention will continue if post-partum low levels of physical activity are continued on the long term, predisposing women to overweight.

Discussion

- SA women have low PA during pregnancy
- Physical activity levels decrease from pre-pregnancy to post-partum
- Largest decrease between first and third trimester (11%)
- Three months postpartum 10% less than in 1st trimester
- Weight gain during pregnancy is within the normal range (13 kg),
- Weight retention at 3 months postpartum is still high (12 kg).

Interventions

- knowledge
- educational
- groups
- Understand the culture
- Dietary intake

The implication

- Educate, demonstrate, activate and maintain
- Address obesity in pregnancy
- Hypertension & Gestational Diabetes risk

Thank you!

