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Running head:
Compulsive Exercise Predicts Poorer Mental Health in Pregnancy: A Longitudinal Study

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Abstract

Introduction: While exercise is often recommended as beneficial for mental health, its role during pregnancy is less clear. The aim of this study was to examine the role of exercise behaviour and compulsive exercise attitudes in relation to perinatal anxiety and depression.

Method: Pregnant women answered an online battery of psychometric questionnaires assessing perinatal depression (Edinburgh Postnatal Depression Scale, EPDS), anxiety (Perinatal Anxiety Screening Scale, PASS), compulsive exercise (Compulsive Exercise Test, CET), social support (Multidimensional Scale of Perceived Social Support, MSPSS), as well as reporting exercise frequency and intensity, sleep, stressors and pregnancy. Depression screening was repeated one month later.

Results: Eighty-eight pregnant women participated, with a mean age of 31.4 years (*SD* = 4.50). All identified as women, 50% had one child, 23% none and the remainder two or more. Sixty-two percent were NZ European, 13% Māori and 3% of Pacific ethnicity. Median baseline gestation was 24 weeks (*SE* = 1.1), with 9% less than 10 weeks pregnant, 29% between 11-20 weeks, 33% between 21-30 weeks and 28% over 31 weeks gestation. A large number of participants reported substantial perinatal mental health symptoms. At baseline, 28.1% met clinical criteria for depression (EPDS M=7.93, SD=4.10), increasing to 37.3% at one month; 20.7% met clinical anxiety thresholds (PASS M=17.99, SD=12.20). Both were predicted by poor sleep, stress, and low social support, though exercise was not significant in these regression models. Most participants (70%) reduced their exercise during pregnancy and reported low-moderate weekly exercise. Exercise frequency showed trend-level associations with baseline depression and anxiety (η^2=.06–.07), but not follow-up depression. Compulsive exercise was uncommon (4.5%), while 85.2% reported high social support. Most participants experienced ≥1 stressor (59%) and nearly half reported sleep problems (47%). Multivariate models indicated that lower social support and greater stress predicted anxiety (R^2=.42), while baseline depression was associated with lower social support and higher compulsive exercise attitudes (R^2=.35). Depression at one month was predicted solely by baseline depression and anxiety (R^2=.47). Compulsive exercise motivations were associated both with more high-intensity exercise during pregnancy, and with depressive symptoms. A focus on weight control was associated with more high-intensity exercise, and avoidance and rule-driven exercise attitudes predicted higher depression. Those in the highest-range exercise group reported the highest depressive symptoms, and the lowest group had higher anxiety scores. Moderate exercise was not associated with either depression or anxiety.

Conclusions:

During pregnancy, mental health appeared more closely tied to compulsive exercise motivations than to exercise behaviour. While moderate exercise would seem to be linked with positive mental health, the reasons behind exercise are important considerations. These pilot findings support holistic perinatal care approaches, including emotional support, lifestyle, and screening for maladaptive exercise attitudes.

Keywords: perinatal depression; perinatal anxiety; exercise; compulsive exercise; longitudinal

Key points

- Pregnant women reported reducing their exercise during pregnancy, and most reported low-moderate rates of exercise. Moderate-range exercise was not linked with depression or anxiety.
- Compulsive exercise motivations were associated with more high-intensity exercise, and also with depressive symptoms. The highest-range exercise group reported the highest depressive symptoms, and the lowest group had more anxiety.

- While exercise is typically helpful, it is important to screen pregnant women for maladaptive exercise motivations and mental health.

Introduction

Pregnancy and the postnatal period can include challenges such as mood disorders and body-image concerns (1, 2). Poor mental health during pregnancy is linked with poor nutrition, substance abuse, lack of physical activity, inadequate prenatal care, sleep disturbances, social isolation, self-neglect, and not seeking medical advice (3). It can affect the parent and child's health and their relationship, which can continue throughout the child's development (4-6).

Perinatal depression is particularly common (3), and can be challenging to identify as some symptoms of depression, such as weight gain and fatigue, are also common during pregnancy (7). Anxiety disorders are equally prevalent and often comorbid with perinatal depression (8). Pregnancy often triggers anxiety and worries about the health of oneself and the baby (9). In NZ, 22% of pregnant wāhine Māori (Māori women) displayed clinical depression and 25% anxiety, compared to 15% of non-Māori with depression and 20% anxiety (10). Stress, sleep problems and poor social support have all been identified as risk factors (11-14)

Exercise is recognised as a valuable tool for enhancing mental health (e.g., 15). During pregnancy, exercise has been linked with reduced depression and anxiety (16), and with better postnatal mental health cross-sectionally (17). However, meta-analyses report insufficient evidence that exercise reduces perinatal depression, nor how much exercise is helpful (18). Past studies have generally been cross-sectional, limiting interpretation of directionality – women with poorer mental health, support or other factors may exercise less, rather than the reverse (19).

Although evidence supports the safety and benefit of moderate exercise during pregnancy (20), 60% of women reduce their exercise levels (21, 22). Different exercise motivations have also been linked with varied psychological well-being (23). Exercising for extrinsic reasons can lead to stress, whereas intrinsic motivations can help alleviate it (24). Compulsive exercise is characterised by a rigid, driven, and excessive exercise behaviour that is primarily motivated by attempts to control weight, shape, or affect, rather than enjoyment or health benefits. This can have detrimental effects on well-being (25) and has been suggested to occur in 0.7% of pregnant women (26). Despite established links between compulsive exercise and poor mental health, it remains largely unexplored in pregnancy (27).

Although there has been an increasing focus on biopsychosocial predictors of perinatal depression internationally (28), little research has been conducted longitudinally, and studies in NZ are scarce. As part of the As part of the Te Kukunetanga: Exercise during Pregnancy studies (29), we investigated maternal psychological well-being in NZ, including connections between mental health, stress, social support, and exercise over time. This article reports on the early data from the study. Links between depressive symptoms, anxiety, exercise behaviours, compulsive exercise attitudes, social support, sleep, and stressors are considered over one month. We anticipate that exercise will be associated with lower rates of subsequent depression, over and above other psychosocial factors; with similar patterns expected for anxiety. We also anticipate that maladaptive motivations for exercise may be a concern linked with higher rates of exercise and with poorer mental health.

Method

Participants

Participants were eligible if they were aged 18 years or older, currently pregnant (at any gestational age), and residing in NZ. A total of 88 participants were recruited.

Materials

Questionnaires

Baseline questionnaires included demographic, pregnancy and lifestyle questions, and psychometric measures of depression, anxiety, compulsive exercise, and social support. Stressors were measured as a checklist of recent life events (e.g., financial problems, relationship difficulties, serious health concerns), summed to create a cumulative stress count. Illness/injury was reported

with an open-ended question, categorised into mild, moderate or severe based on the impact on exercise and health (for example, allergies were mild, history of stroke was severe). Sleep quality in the last week was reported on a modified version of the Auckland Sleep Questionnaire (30), with items including "did you have trouble falling asleep, staying asleep or waking early at least three nights a week for the last month", "does this interfere with your activities the next day", and a Likert scale report of sleep quality from very badly to very well, which was converted to a binary "sleep problems" (no/yes) variable due to the varied response formats. After one month, participants were asked to complete only the depression scale again.

Edinburgh Postnatal Depression Scale

The Edinburgh Postnatal Depression Scale (EPDS) assesses symptoms of perinatal depression (31), and is commonly used in perinatal populations in NZ. It can be used repeatedly to identify changes, and demonstrates good psychometric properties (32). Scores range from 0-30, with scores over 11 indicating severity warranting clinical attention, maximising sensitivity and specificity (33). If any suicidal thoughts were reported (item 10), the researchers contacted the participant's nominated health professional. Good reliability was noted (Cronbach's α = .83).

Perinatal Anxiety Screening Scale

The Perinatal Anxiety Screening Scale (PASS) assesses anxiety symptoms over the previous month (34). A cut-off score of 26 can be used to indicate likely clinical anxiety, with demonstrated sensitivity of 70% and specificity of 30% (35). The total scale score was used, with excellent internal consistency (α = .928).

Compulsive Exercise Test

The Compulsive Exercise Test (CET) evaluates factors contributing to compulsive exercise, with five subscales assessing Avoidance and rule-driven behaviour; Weight control exercise; Mood improvement; Lack of exercise enjoyment; and Exercise rigidity (36). A mean score ≥ 15 indicates unhealthy attitudes towards exercise (37). Previously, the CET has been used in studies with people with eating disorders and those who exercise frequently (e.g., 38). I It was used here to explore participants' motivations for exercising. It showed good reliability for the total scale (α = .829) and for each subscale (α =.725 - .878)

Multidimensional Scale of Perceived Social Support

The Multidimensional Scale of Perceived Social Support (MSPSS) assesses perceived social support across three subscales: Significant other, Family and Friends (39). It has good psychometric properties including with pregnant women (39, 40). In the current sample, reliability was excellent (total scale α = .926, subscale α =.931 - 944).

Exercise

Participants reported their frequency (from < 30 min to >6 hours per week) of low-, moderate-, and high-intensity exercise before and during pregnancy. Total exercise was calculated using the modified training impulse (TRIMP) method, as the product of frequency by intensity (low intensity time multiplied by one, moderate by two and high by three) (41). Exercise frequency was calculated, with <30 minutes across all intensities considered "low", 30 minutes – 4 hours "moderate" and 5 or more hours "high".

Procedure

This study was approved by Auckland University of Technology Ethics Committee (AUTEC Ref 23/96, 6/6/23). Recruitment was purposive, with study invitations shared through social media groups across NZ (pregnancy, parenting and regional community groups). Surveys were administered using Research Electronic Data Capture (REDCap, 42). Participants reviewed study information and indicated consent through an online checkbox. This study reports the baseline and one-month data, although participants continued to receive questionnaires for 12 months. The full longitudinal dataset is currently undergoing analysis.

The surveys were not anonymous, with contact information needed to provide monthly surveys, and nominated healthcare professional details recorded in case responses indicated concerns. Each month, one participant was randomly selected to receive a $100 gift voucher, in compensation for their time, provided by the [redacted].

Data Analysis

All analyses were conducted using SPSS v.30. Given the use of clinical measures in a non-clinical sample, non-normality was expected, however skewness and kurtosis values were acceptable. Spearman's correlations were used to be conservative, and assumptions were met for Linear Regression. Given the strong correlation and conceptual overlap between depression and anxiety, each was tested separately. Several regression models were tested to examine relationships between hypothesised predictors and outcomes. Only the final models containing significant predictors are presented, for clarity. One-way Analysis of Variance (ANOVA) tested differences in symptoms across levels of exercise. Sensitivity analyses were conducted to examine the robustness of findings across alternative analytic specifications. Key multivariate models were re-estimated using categorical symptom thresholds, alternative representations of exercise behaviour, and with influential outliers excluded. Results were consistent across specifications. Full results are available on request.

Illnesses/injuries were categorised based on severity, and number of stressors were summed. Missing items appeared to be missing at random. Mean imputation was used for <20% missing items, with participants missing >20% removed from that subscale. A Mann–Whitney U test examined whether baseline depression differed between participants who did and did not provide one-month responses. Baseline depression scores were higher among participants with missing follow-up data (mean rank = 52.20, n = 22) compared to those with complete data (mean rank = 42.63, n = 67), but this difference was not statistically significant (U = 578.50, Z = –1.51, p = .13).

Results

Demographic information

Participants' mean age was 31.4 years (*SD* = 4.50), all identified as women, 50% had one child, 23% none and the remainder two or more. Sixty-one percent worked full-time and 21% part-time; 62% were NZ European, 13% Māori and 3% of Pacific ethnicity; 97% were married or partnered. Seventy-six percent were university educated. Median baseline gestation was 24 weeks (*SE* = 1.1), with 9% less than 10 weeks pregnant, 29% between 11-20 weeks, 33% between 21-30 weeks and 28% over 31 weeks gestation.

Psychometric Assessments

Table 1 provides psychometric assessment data. A high proportion of participants reported clinical-range depression (EPDS) scores at baseline (28.1%) and after one month (37.3%). Over 20% reported clinical anxiety (PASS) scores, while 4.5% were in the clinical range for compulsive exercise (CET). Most reported high social support (MSPSS).

Lifestyle Factors

As noted in Table 2, many participants (59%) reported one or more stressors, while 41 (48%) reported sleep problems. Only 25% (n = 21) reported an illness/injury that affected well-being or made exercising difficult.

Exercise

During pregnancy, 70.1% (n=61) of participants reduced exercise based on changes in TRIMP score, while 18.4% (n=16) maintained pre-pregnancy exercise levels and 11.5% (n=10) increased. Table 3 reports low-, moderate- and high-intensity exercise frequencies, prior to pregnancy and currently. A one-way ANOVA examined differences in baseline EPDS scores across three levels of exercise frequency (low *M*= 7.86, *SD* = 1.18; moderate *M*=7.27, *SD*=0.54; high *M*=9.89, *SD*=.91). The overall model approached significance, $F(2, 84) = 2.84$, $p = .064$, with a small-to-moderate effect size ($\eta^2 = .06$). Although the overall effect was not significant, post-hoc Bonferroni comparisons suggested a trend toward higher EPDS scores in the *high* exercise group compared to the moderate group ($p = .058$, *M* difference = 2.62, 95% CI [−0.07, 5.30], see Figure 1). No other pairwise comparisons reached significance. This trend was not apparent for depression one month later ($p > .05$).

For baseline anxiety (low *M*=25.29, *SD*=4.73; moderate *M*=15.78, *SD*=1.50; high *M*=19.41, *SD*=1.99), the one-way ANOVA again approached statistical significance, $F(2, 83) = 2.99$, $p = .056$, with a small-to-moderate effect size ($\eta^2 = .07$). Post-hoc Bonferroni comparisons indicated a trend toward higher anxiety scores in the *low* exercise group compared to the moderate group ($p = .059$, *M* difference = 8.50, 95% CI [−0.24, 17.25], see Figure 2). No other pairwise comparisons were significant.

Bivariate Relationships

Most bivariate relationships are as expected, including positive correlations between baseline and 1-month depression scores, baseline anxiety and depression scores, and a protective effect between social support and anxiety, and with both depression timepoints (see Table 4). Baseline stressors were most relevant for baseline depression and anxiety, and indicated a trend (p=.09) for 1-month depression. Illness/injury was associated with stress, but not other factors. Poor sleep correlated with depression and anxiety. Current and prior higher exercise levels were associated

with compulsive exercise attitudes. Having more children correlated with higher baseline depression, lower compulsive exercise attitudes, lower social support and poorer sleep.

Multivariate Analyses

Predictors of each mental health outcome (baseline depression, baseline anxiety, 1-month depression) were tested (including social support, exercise attitudes, TRIMP, sleep, stress, illness/injury, number of children), to evaluate the role of exercise relative to other expected factors. Baseline anxiety was predicted by lower social support and higher stressors (p<.001), with no other predictors significant (R^2=.418, n=86; see Table 5).

Exercise, stressors, sleep problems and number of children are not significant predictors of baseline depression; however, low social support and higher compulsive exercise attitudes were (see Table 6).

Although not a strong model in this small sample, the "avoidance" CET subscale predicted concurrent depression, while other types of compulsive exercise attitudes did not (see Table 7).

To investigate the link between compulsive exercise attitudes and exercise in pregnancy as seen in correlations above, further regression models were tested (see Table 8). A focus on weight control predicted more frequent/intense exercise, while a lack of enjoyment predicted less. No other CET subscales met significance.

Table 9 provides the regression models for all hypothesised predictors of depression over time, while Table 10 provides the final model after non-significant predictors were removed. Only baseline depression and anxiety were significant predictors of depression one month later, with all other tested predictors non-significant (CET, MSPSS, stress, illness/injury, sleep problems, TRIMP prior to pregnancy, number of children). Concurrent TRIMP approached significance (p<.057) in the multivariate regression model, but not once other predictors were removed.

Discussion

This pilot study found high rates of depression and anxiety among pregnant women in NZ (28% baseline depression, 37% one month later; 21% baseline anxiety). Compulsive exercise attitudes showed nuanced relationships with exercise and mental health in pregnancy, associated with both higher intensity exercise and higher depression scores, particularly for those reporting rigid, avoidant and weight-control reasons for exercising. Most participants (85%) reported good social support, at least one life stressor (60%), and many noted poor sleep (48%). Depression and anxiety symptoms were strongly correlated, and with stress and poor sleep, while social support was protective. Baseline depression was predicted by low social support and compulsive exercise attitudes, but not by sleep, stressors, number of children or exercise behaviour. Low social support and more stressors predicted anxiety in a robust model. Longitudinally, only baseline depression and anxiety symptoms predicted later depression, although exercise behaviour approached significance. Although sleep problems and recent stressors were not significant predictors once other variables were accounted for, they were correlated with depression and anxiety. Given prior evidence that stress and poor sleep are robust predictors of perinatal mental health difficulties (3), these factors remain important considerations for screening and support.

This study has potential implications for the support and care of pregnant women in NZ. Firstly, a substantial mental health burden was reported. A large number of participants reported clinically significant anxiety and depression, increasing over one month, at higher rates than official estimates (8, 43). Anecdotally, when the participants' healthcare providers were contacted about their risk indication, most were unaware of mental health difficulties for their patient, and had not discussed this with them previously. Low social support was one of the most consistent predictors of depression and anxiety, consistent with previous research (44). Interventions to strengthen mental health screening and social support could reduce emotional distress during pregnancy; however, additional risk factors warrant consideration.

During pregnancy, most participants (70%) reduced their exercise levels. Most reported low amounts of weekly exercise, contrary to evidence that four or more sessions per week supports mental health during pregnancy (45). Although moderate exercise is generally associated with good mental health (15, 46), this study reveals different patterns during pregnancy, where exercise may be limited by physical symptoms, risk perceptions, or social messaging.

This study is the first we know of to evaluate the role of compulsive exercise beliefs during pregnancy, and links with mental health and exercise behaviour. A small number of participants recorded compulsive exercise motivations, associated both with more high-intensity exercise during pregnancy and with psychological symptoms. More intense exercise was associated with a focus on weight control, while less intense exercise was linked with a lack of enjoyment. Avoidance and rule-driven exercise attitudes predicted higher depression. Exercise behaviour itself was not a direct predictor of depression or anxiety during pregnancy; however, higher levels of exercise were associated with compulsive, rule-driven and weight-control exercise attitudes, and these maladaptive exercise attitudes were in turn associated with poorer mental health. The amount of exercise did not predict mental health; the reasons for exercising did.

Interesting patterns appeared when considering minimal (<30 min per week), moderate (30 min – 4 hours per week) and high (>5 hours per week) exercise ranges. Baseline depression scores are highest for the high exercise group, with differences negligible for minimal-moderate ranges. This is consistent with the compulsive exercise attitudes reported by this group, suggesting potentially problematic reasons for exercise. Some pregnant people appear to exercise at high levels while experiencing elevated depression, and also to hold rigid and avoidant beliefs about exercise. Those who exercised most also focused on weight control.

Higher perinatal depression symptoms were associated with avoidance and rule-driven behaviour, reflecting guilt when unable to exercise, following strict exercise rules including continuing to exercise despite injury/illness, and exercise withdrawal symptoms. This subscale also incorporates the avoidance of negative affect linked with not exercising (47). Previous research has linked this factor with body dissatisfaction, stress, depression and anxiety among recreational exercisers and athletes, and with psychopathology amongst adolescents with eating disorders (47, 48). Exercise did not appear to be linearly protective against depression during pregnancy, with a more nuanced relationship evident – the highest range of exercise behaviour predicted *higher* depression scores and compulsive exercise attitudes. Although only approaching significance, given the limited sample size here, these trends warrant investigation with larger samples.

Conversely, those in the low and high range of exercise frequency both showed higher anxiety scores – most notably those in the *low* exercise range. While compulsive exercise attitudes were not linearly related to anxiety, it appears that something different is happening – some who are anxious avoid exercise, others exercise frequently. Those reporting minimal exercise also reported not enjoying it. Further exploration of qualitative aspects of exercise motivation will be key to understanding exercise behaviours in pregnancy, and links with mental health.

In NZ, perinatal mental health screening is at times unclear or culturally inappropriate (49). Cultural differences may also influence the understanding and acceptance of depression, thereby affecting help-seeking (50). Māori and Pacific mothers were underrepresented in the present study and should be prioritised in future research.

These results should be interpreted with caution – the modest sample size limits statistical power and inferences. Findings approaching significance should be interpreted with caution. Despite this, significant results were interesting, and several near-significant findings may well reach significance in larger samples, warranting replication on a larger scale. Attrition limits interpretation of longitudinal findings – it is unclear why these participants did not complete the one-month survey. Self-report studies are always limited by concerns about recall, social desirability or response biases, although the voluntary nature of these surveys and potential disclosure of concerns to participants' health professionals supports veracity here. Further evaluation of longer-term data from this sample is underway. Additionally, physical health markers including weight and pregnancy weight gain should be considered in future studies. Future research could also investigate the role of less structured physical activity, such as incidental exercise.

This study has implications for future research and support during pregnancy. Qualitative research could explore why pregnant people engage with exercise in more detail. Interventions should consider targeting exercise attitudes, particularly among pregnant people with a history of eating disorders or body dysmorphia. During pregnancy, mental health appears to show nuanced links with exercise. While moderate exercise shows trends toward better mental health, the reasons behind exercise matter more than the amount, with maladaptive exercise attitudes associated with poorer mental health.

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Statement of Ethics:
Ethics approval was received from Auckland University of Technology Ethics Committee (AUTEC) on 6/6/23, reference 23/96. Written informed consent to participate was not directly obtained but inferred by the completion of the survey.

Conflict of interest statement:
The authors have no competing interests to declare.

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Author Contributions:
AK and LD contributed to the study conceptualisation and methodology. Data collection was performed by AK, LD and OB, and data analysis by AK. The initial literature review was conducted by OB. The manuscript was written by AK and all authors read and approved the final manuscript.

Data availability statement: The data that support the findings of this study are not publicly available due to privacy reasons, but are available from the corresponding author upon reasonable request.

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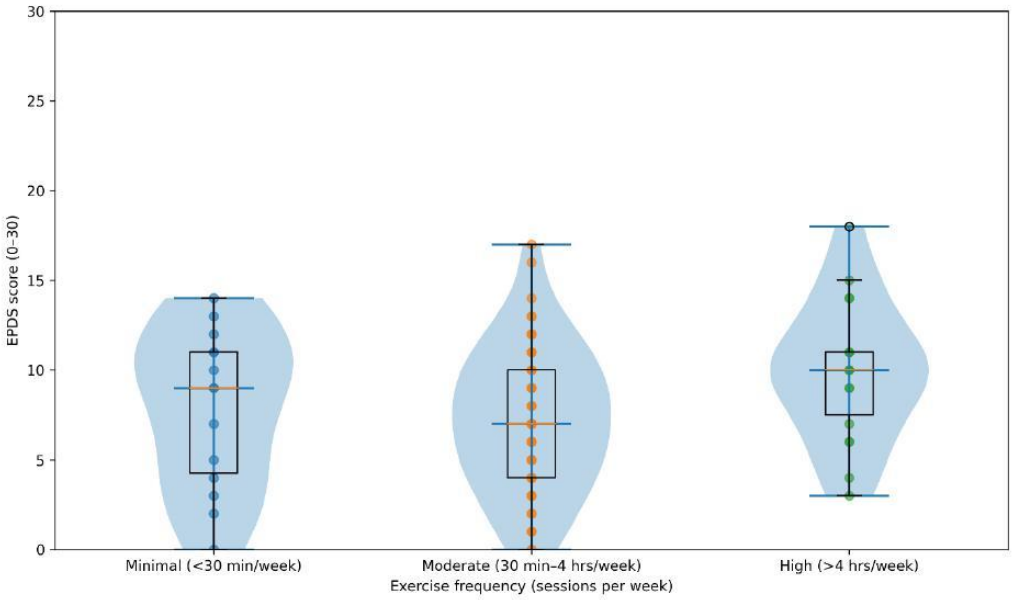
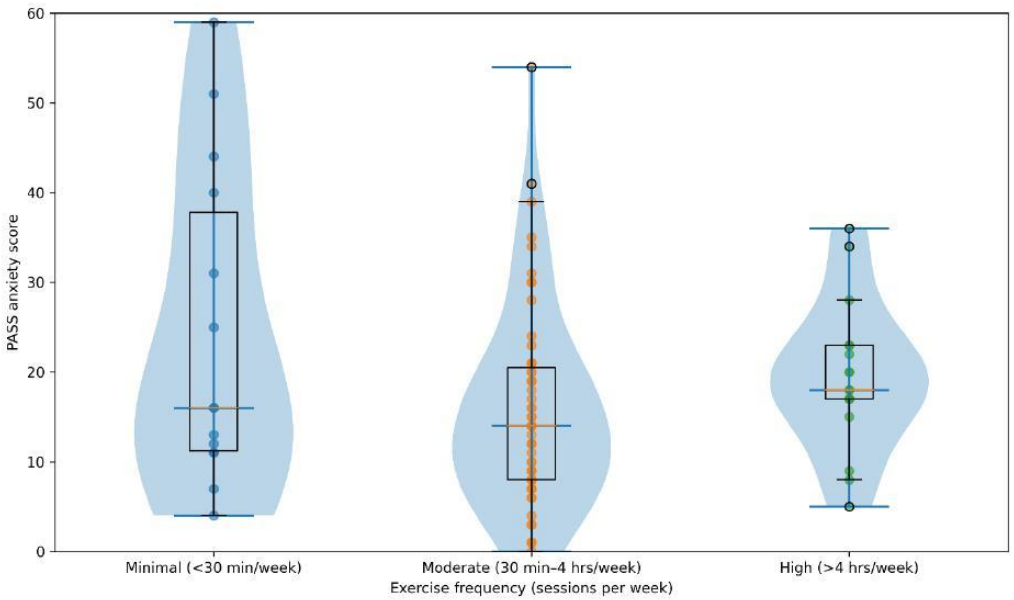
Figure 1.
Baseline depression by exercise frequency

Note. Distribution of baseline EPDS scores by exercise frequency. Violin plots show score density, boxes show interquartile range and median, and points represent individual participants.

Figure 2.
Baseline anxiety by exercise frequency

Note. Distribution of baseline PASS anxiety scores by exercise frequency. Violin plots show score density, boxes show interquartile range and median, and points represent individual participants.





Psychometric Assessments

Table 1.

Variable	n	Percentage	Range	Mean (SD)
EPDS	88		0 – 18	7.93 (4.10)
Clinical	25	28.1%	11 – 18	
Non-clinical	63	71.9%	0 – 10	
EPDS 1M	67		1 – 19	7.99 (4.12)
Clinical	25	37.3%	11 – 19	
Non-clinical	42	62.7%	1 – 10	
PASS	87		0 – 59	17.99 (12.20)
Clinical	18	20.7%	26 – 59	
Non-clinical	69	79.3%	0 – 25	
CET	88		3-17	10.01 (2.73))
Clinical	4	4.5%	15-17	
Non-clinical	84	95.5%	3-14	
MSPSS	88		1-7	5.91 (1.01)
Low support	2	2.3%	1 – 2.9	
Moderate	11	12.5%	3-5	
High support	75	85.2%	5.1-7	

Note. *EPDS* = Edinburgh Postnatal Depression Scale at baseline; *EPDS 1M* = EPDS at One Month; *PASS* = Perinatal Anxiety Screening Scale; *CET* = Compulsive Exercise Test; *MSPSS* = Multidimensional Scale of Perceived Support.

Lifestyle Factors

Table 2.

Variable	*n*	%
Injury/Illness		
None	66	74.2%
Mild	8	9.0%
Moderate	13	14.6%
Severe	2	2.2%
Stressors		
None	36	40.0%
1	21	23.3%
2	20	22.2%
3	8	8.9%
4	3	3.3%
5	2	2.2%
Sleep		
No problem	41	48%
Sleep problem	40	47%

Note: Injury/Illness= Existing injuries/illness rated on severity of impact on exercise, *Stressors* = count based on checklist of significant life stressors, *Sleep* = reported sleep difficulties.

Table 3.

Exercise Prior to Pregnancy and Currently

	<30 mins		30-60 mins		1-2 hours		3-4 hours		5-6 hours		>6 hours	
	Prior	Current	Prior	Current	Prior	Current	Prior	Current	Prior	Current	Prior	Current
Low	8.0%	17.2%	6.9%	18.4%	29.9%	19.5%	27.6%	25.3%	13.8%	9.2%	13.8%	10.3%
Mod	20.7%	42.5%	20.7%	23.0%	25.3%	21.8%	21.8%	9.2%	6.9%	9.2%	4.6%	3.3%
High	52.9%	86.2%	16.1%	3.4%	16.1%	4.6%	9.2%	2.3%	2.3%	1.1%	3.4%	2.3%

Note. Frequency and intensity of exercise per week, prior to pregnancy and currently (e.g., 8.0% of participants reported <30 min of low intensity exercise per week.) Valid percentages reported.

Bivariate Relationships

Table 4.

Spearman's Correlations

Variable	1	2	3	4	5	6	7	8	9	10
1. EPDS	-									
2. EPDS 1M	.615**	-								
3. PASS	.623**	.637**	-							
4. CET	.118	.015	0.031	-						
5. MSPSS	-.395**	-.286*	-.434**	.070	-					
6. Stressors	.258*	.203	.526**	-.186	-.126	-				
7. Injury/Illness	-.085	.068	.207	-.187	.027	.378**	-			
8. Sleep	.338**	.075	.238*	-.052	-.155	.161	-.019	-		
9. TRIMP Prior	.110	-.027	-.094	.454**	-.040	-.072	-.120	-.021	-	
10. TRIMP current	.182	-.193	-.071	.347**	-.150	-.014	-.165	.042	.738**	-
11. Children	.237*	.070	.194	-.249*	-.299**	.204	.081	.293*	-.181	-.121

Note. *EPDS* = Edinburgh Postnatal Depression Scale at baseline, *EPDS 1M* = EPDS at One Month, *PASS* = Perinatal Anxiety Screening Scale, *CET* = Compulsive Exercise Test, *MSPSS* = Multidimensional Scale of Perceived Support, *TRIMP prior* = exercise intensity x frequency prior to pregnancy, *TRIMP current* = exercise intensity x frequency during pregnancy. **p<.01, *p<.05 (two-tailed)

Table 5.

Anxiety

Predictor	B	SE B	β	*t*	*p*
Constant	39.995	6.373		6.275	<.001
MSPSS	-4.650	1.030	-.378	-4.514	<.001
Stressors	4.612	.801	.483	5.759	<.001

Note: R^2 = .418, *n* = 86. Dependent variable: PASS anxiety baseline.

Table 6.

Baseline Depression

Predictor	B	SE B	β	*t*	*p*
Constant	11.225	3.850		2.915	.005
CET	.365	.158	.251	2.309	.024
MSPSS	-1.680	.476	-.377	-3.532	<.001
Stressors	.498	.322	.159	1.545	.127
Sleep problems	1.411	.902	.166	1.565	.122
Number of children	.453	.453	.110	1.000	.321
TRIMP (current)	.031	.071	.047	.441	.661

Note: R^2 = .349, *n* = 73. Dependent variable: EPDS baseline.

Table 7.

Exercise attitudes and baseline depression

Predictor	B	SE B	β	*t*	*p*
Constant	5.390	2.083		2.587	.011
CET Avoidance	1.981	.722	.390	2.743	.007
CET Weight Control	.096	.722	.390	2.743	.853
CET Mood	-.110	.505	-.032	-.217	.829
CET Lack Enjoyment	.690	.435	.223	1.588	.116
CET Rigidity	-.639	.493	-.183	-1.295	.199

Note: R^2 = .128, *n* = 87. Dependent variable: EPDS baseline.

Table 8.

Exercise attitudes and exercise behaviour

Predictor	B	SE B	β	*t*	*p*
Constant	11.493	2.622		4.383	<.001
CET Avoidance	.019	.913	.003	.021	.984
CET Weight Control	1.996	.913	.329	3.074	.003
CET Mood	-.665	.635	-.135	-1.047	.298
CET Lack Enjoyment	-1.646	.548	-.374	-3.005	.004
CET Rigidity	.970	.621	.195	1.563	.122

Note: R^2 = .325, *n* = 86. Dependent variable: current TRIMP (exercise frequency x intensity).

Table 9.

Predictors of depression over time – initial multivariate model based on hypothesis

Predictor	B	SE B	β	*t*	*p*
Constant	4.54	4.63		.98	.33
EPDS baseline	.383	.152	.363	2.521	.015
PASS baseline	.181	.055	.530	3.294	.002
CET	-.115	.181	-.079	-.632	.530
MSPSS	.350	.584	.078	.599	.552
Stressors	-.478	.384	-.153	-1.246	.219
Illness/injury	.383	.570	.080	.671	.506
Sleep problems	-.588	1.011	-.064	-.582	.564
TRIMP prior	.084	.100	.119	.844	.403
TRIMP baseline	-.241	.123	-.271	-1.956	.057
Number of children	-.732	.634	-.139	-1.154	.254

Note: R^2 = .559, n = 66. Dependent variable: EPDS 1 month.

Table 10.

Predictors of depression over time – final model

Predictor	B	SE B	β	*t*	*p*
Constant	2.858	.806		3.557	<.001
EPDS baseline	.356	.127	.343	2.806	.007
PASS baseline	.144	.043	.408	3.335	.001

Note: R^2 = .471, *n* = 66. Dependent variable: EPDS 1 month.