

Menstrual Cycle and Physical Activity (PA) Participation: Daily Tracking of the Theory of Planned Behaviour (TPB) Constructs During the Menstrual cycle



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Introduction

- Females tend to be less active than their male counterparts (Troiano et al., 2008)
 - TPB and its constructs (attitudes, subjective norms [SN], perceived behavioral control [PBC], & intention; Ajzen, 2001) have been found useful in predicting PA (Norman & Conner, 2005)
 - In a cross-sectional study, general menstrual attitudes and TPB components predicted PA

<u>Analysis</u>

- Several multilevel models were performed to examine differences in each TPB component and PA
 - Predictors included phase (dummy coded: proliferative (reference group), menstrual, secretory) and oral contraceptive (OC) use (level 2) and their interactions

Discussion

- When examining the TPB components between phases, some perceptions (attitudes, subjective norms & PBC [trend]) appeared to differ across the phases in those not taking OC
- OC users had more positive *attitudes* towards PA during menstruation than non-OC users
 Supports Wilcoxen et al. (1976) daily diary study that showed less negative affect during the menstruation for OC users than non-OC users
 This might be important given that instrumental attitudes lead to intention as reported in our previous work (Croteau & Wilson, 2016)

- during menstruation (Croteau & Wilson, 2016)
- The three phases of the menstrual cycle are (Tortora & Grabowski, 2006):
 - Menstruation shedding of uterine lining
 - Proliferative high estrogen level for follicle maturation (i.e., ovulation)
 - Secretory fertilized egg growth or inhibiting luteinizing hormone to signal menstruation
- Research has focused on how physical performance (e.g., strength) differs across the menstrual cycle (e.g., Janse de Jonge, 2003)
 - Unclear how the TPB constructs change throughout the menstrual cycle

Purpose

To explore how the TPB components and selfreported PA varied throughout the menstrual cycle while considering oral contraceptive use (OC)

Methods



- For all participants, higher norms were reported in secretory phase than other phases
 - This is the phase associated with PMS and might be that individuals feel more pressure to be active during this phase
- OC users also experienced higher subjective norms during menstruation than non-OC users
 - If OC use decreases symptoms, perhaps other people pressured the individual to be more active during this time
- There was a trend towards significance for PBC with non-OC users reporting more difficulty being active during the menstrual phase than other phases
 - Supports qualitative studies that discuss the challenges of being active during menstruation (Held, 2013)
- Surprisingly, PA and intention did not appear to vary across the phases
 - One previous study assessed distance walked across the menstrual cycle and reported no differences by phase but high individual variability (Chrisler & McCool, 1991)
 Measurement of PA via self-report

Participants:

Of the 21 females who participated (M_{age} =24.6 years, SD_{age} =4.0), 4 were OC users The average length of the menstrual cycle was 26.6 days (SD=3.8); with a mean length of menstruation phase of 4.6 days (SD=1.6)

Procedures:

Participants volunteered via online survey, social media posting, and class advertising Completed a diary daily (M=36.6 days) via text message (some were extended to acquire a full menstrual cycle)

Measures:

Baseline questionnaire: age, gender, OC use, and menstrual statistics

Each daily text answered 8 questions:

- *Basal body temperature tracking (BBT)*: What is your temperature? (temp 1) (temp 2)
- Intention: Do you intent to exercise today? No(1) to Yes (5)



<u>Results</u>

Physical activity (*ICC*=0.15): Did not differ across phase (Secretory: *b*=2.3, *p*=.19; Menstrual: *b*=-0.8, *p*=.79) or with OC use (*b*=10.2, *p*=.12)

Intention (*ICC*=0.13): Did not differ across phases (Secretory: *b*=0.1, *p*=.57; Menstrual: *b*=-0.2, *p*=.46) or with OC use (*b*=0.1, *p*=.59)

<u>PBC</u> (*ICC*=0.21): The menstrual phase by OC use interaction approached significance (*p*=0.095)

- Non-OC users: Less PBC during the menstrual phase than the other phases
 - (b=-0.4, p=.09)
- OC users: No difference in PBC across the phases (b=0.2, p=.43)

<u>Attitudes</u> (*ICC*=0.20): There was a menstrual phase by OC use interaction (*p*=.02)

Non-OC users: More negative attitudes during the menstrual phase than the other phases (*b*=-0.6, *p*=.01)
OC users: No difference in attitudes across the phases (*b*=0.2, *p*=.38)

Strengths

Prospective tracking of BBT ensured greater accuracy of menstrual cycle phases The ease to which the temperature reading and text

diary facilitated completion (2 participants ended early, 14%)

Limitations

Missing PA intensities or types, which could be an avenue for future research to compare changes in structured and unstructured PA (Spink et al., 2012) Accuracy of menstrual cycle was dependent on females following procedures (i.e., stayed in bed to take temp.)

Conclusion

Perceptions of TPB constructs (attitudes, SN and PBC) may vary across the menstrual cycle depending on whether a female uses OC or not.
Non-OC users experienced more negative attitudes towards PA and perceived being more difficult in the menstrual phase.
All participants perceived greater pressures to be active from others during the secretory phase and OC users also felt those pressures during the menstrual phase.
Future research should consider how the menstrual cycle influences individuals' perceptions and

- *PA:* How many minutes of exercise did you complete yesterday?
- Mood: What is your <u>general mood</u> today? Bad (1) to Good (5)
- *Attitude:* For me to exercise today, I would consider to be an *unpleasant/pleasant* experience? Unpleasant (1) to Pleasant (5)
- SN: People important to me think I should/should not exercise today. Should not (1) to Should (5)
 PBC: For me to exercise today, I perceive to be difficult/easy. Difficult (1) to Easy (5)
- *Comments:* (illness; soreness; general/alcohol dehydration; menstruation)

Subjective Norms (ICC=0.31): For all, there were greater SN during the secretory phase (b=0.2, p=.05). There was a menstrual phase by OC use interaction (p=.039)
OC users: Greater SN during menstruation than

- the other phases (b=0.4; p=.04)
- Non-OC users: no difference in SN across the phases (b=-0.2, p=0.36)

examine how these perceptions relate to PA.