

# Menstrual cycle and athletic status interact to influence symptoms, mood, and cognition in females

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# Burgess Mood Scale

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Please tell us about your mood. How are you feeling right now?

## 1. Mentally, I feel energetic

**Explanation of question:** Someone who is “mentally energetic” is feeling ready for the rest of the day, and is generally feeling “up for it” and ready to go. Note that the question does not relate to how much energy physically you have, but refers instead to your *state of mind*.

|                |                      |                          |               |                       |                            |                       |
|----------------|----------------------|--------------------------|---------------|-----------------------|----------------------------|-----------------------|
| 1              | 2                    | 3                        | 4             | 5                     | 6                          | 7                     |
| Definitely not | Much less than usual | A little less than usual | About average | A bit more than usual | Definitely more than usual | A lot more than usual |

## 2. I feel sad

**Explanation of question:** The question refers to how you feel *right now at this moment*.

|                |                      |                          |               |                       |                            |                       |
|----------------|----------------------|--------------------------|---------------|-----------------------|----------------------------|-----------------------|
| 1              | 2                    | 3                        | 4             | 5                     | 6                          | 7                     |
| Definitely not | Much less than usual | A little less than usual | About average | A bit more than usual | Definitely more than usual | A lot more than usual |

## 3. I feel alert

**Explanation of question:** Right at this moment, do you feel like you are mentally sharp and fully aware of everything going on around you? Do you think you could react to things quickly?

|                |                      |                          |               |                       |                            |                       |
|----------------|----------------------|--------------------------|---------------|-----------------------|----------------------------|-----------------------|
| 1              | 2                    | 3                        | 4             | 5                     | 6                          | 7                     |
| Definitely not | Much less than usual | A little less than usual | About average | A bit more than usual | Definitely more than usual | A lot more than usual |

## 4. I feel nervous

**Explanation of question.** Do you feel jittery at this moment? Signs of nervousness might include: raised heart rate, increased rate of breathing, a feeling of not wanting to sit still, sweating, and anticipation. (We don’t mean nervous about how well you might perform your exercise, but nervousness more generally about life.)

|                |                      |                          |               |                       |                            |                       |
|----------------|----------------------|--------------------------|---------------|-----------------------|----------------------------|-----------------------|
| 1              | 2                    | 3                        | 4             | 5                     | 6                          | 7                     |
| Definitely not | Much less than usual | A little less than usual | About average | A bit more than usual | Definitely more than usual | A lot more than usual |

## 5. I feel focussed

**Explanation of question:** Do you feel like you are clear about what you want to achieve right now and later on today? Do you feel “in the moment” and able to concentrate on what you are doing?

|                |                      |                          |               |                       |                            |                       |
|----------------|----------------------|--------------------------|---------------|-----------------------|----------------------------|-----------------------|
| 1              | 2                    | 3                        | 4             | 5                     | 6                          | 7                     |
| Definitely not | Much less than usual | A little less than usual | About average | A bit more than usual | Definitely more than usual | A lot more than usual |

## 6. I feel lethargic and lacking motivation

**Explanation of question:** Do you feel like you are lacking in motivation, and would prefer to do nothing? Note that the question isn't referring to your motivation to exercise specifically, but is asking if your attitude more generally to life right now is "I can't be bothered, I'd rather sit and do nothing".

|                |                      |                          |               |                       |                            |                       |
|----------------|----------------------|--------------------------|---------------|-----------------------|----------------------------|-----------------------|
| 1              | 2                    | 3                        | 4             | 5                     | 6                          | 7                     |
| Definitely not | Much less than usual | A little less than usual | About average | A bit more than usual | Definitely more than usual | A lot more than usual |

## 7. I feel sleepy

**Explanation of question:** Do you feel like you could easily fall asleep now, or that you would benefit from some sleep if you could?

|                |                      |                          |               |                       |                            |                       |
|----------------|----------------------|--------------------------|---------------|-----------------------|----------------------------|-----------------------|
| 1              | 2                    | 3                        | 4             | 5                     | 6                          | 7                     |
| Definitely not | Much less than usual | A little less than usual | About average | A bit more than usual | Definitely more than usual | A lot more than usual |

## 8. I feel calm

**Explanation of question:** Do you feel relaxed and content?

|                |                      |                          |               |                       |                            |                       |
|----------------|----------------------|--------------------------|---------------|-----------------------|----------------------------|-----------------------|
| 1              | 2                    | 3                        | 4             | 5                     | 6                          | 7                     |
| Definitely not | Much less than usual | A little less than usual | About average | A bit more than usual | Definitely more than usual | A lot more than usual |

## 9. I feel distracted

**Explanation of question:** Is your head full of many thoughts, and you are having trouble concentrating on one thing?

|                |                      |                          |               |                       |                            |                       |
|----------------|----------------------|--------------------------|---------------|-----------------------|----------------------------|-----------------------|
| 1              | 2                    | 3                        | 4             | 5                     | 6                          | 7                     |
| Definitely not | Much less than usual | A little less than usual | About average | A bit more than usual | Definitely more than usual | A lot more than usual |

## 10. I feel glad

**Explanation of question:** Do you feel buoyant at the moment? Are you in a celebratory mood, pleased and happy?

|                |                      |                          |               |                       |                            |                       |
|----------------|----------------------|--------------------------|---------------|-----------------------|----------------------------|-----------------------|
| 1              | 2                    | 3                        | 4             | 5                     | 6                          | 7                     |
| Definitely not | Much less than usual | A little less than usual | About average | A bit more than usual | Definitely more than usual | A lot more than usual |

# Burgess Mood Scale Scoring

Factor analysis by varimax rotation, with polychoric correlations, is applied to the output, which produces two factors:

**Drive** [Energetic, Alert, Happy/Glad, Focused, Distracted(-1), Sad(-1), Lethargic(-1), Sleepy(-1)],  
Distracted(-1)

**Serenity** [Calm, Nervous(-1)]

## **Reference for previous use of this questionnaire in the context of menstrual cycle effects:**

Ronca, F., Blodgett, J.M., Bruinvels, G., Lowery, M., Raviraj, M., Sandhar, G., Symeonides, N., Jones, C., Loosemore, M. and Burgess, P.W., 2025. Attentional, anticipatory and spatial cognition fluctuate throughout the menstrual cycle: Potential implications for female sport. *Neuropsychologia*, 206, p.108909

# Menstrual cycle symptom questionnaire

The menstrual cycle symptom list below was taken from Davison et al. (2022) and Bruinvels et al. (2021), and it was implemented in Ronca et al. (2025) in the current format.

For analysis, symptoms were added up into two categories: Cognitive symptoms and physical symptoms, totalling 14 possible physical symptoms and 8 possible cognitive symptoms.

**Are you experiencing any of the following symptoms today?**  
[Please select all that apply]

| Listed symptom                                       | Classification for analysis |
|------------------------------------------------------|-----------------------------|
| Stomach/menstrual cramps                             | Physical symptom            |
| Headaches/migraine                                   | Cognitive symptom           |
| Lower back pain                                      | Physical symptom            |
| Joint pain and/or muscle cramps                      | Physical symptom            |
| Nausea/sickness/vomiting                             | Physical symptom            |
| Diarrhoea                                            | Physical symptom            |
| Constipation                                         | Physical symptom            |
| Increased tiredness/fatigue                          | Physical symptom            |
| Dizziness/light-headedness/reduced coordination      | Cognitive symptom           |
| Disrupted sleep                                      | Cognitive symptom           |
| Brain fog                                            | Cognitive symptom           |
| Water retention                                      | Physical symptom            |
| Weight gain                                          | Physical symptom            |
| Changes in mood (e.g. stress, anxiety or depression) | Cognitive symptom           |
| Increased irritability                               | Cognitive symptom           |
| Cravings/increased appetite                          | Cognitive symptom           |
| Poor concentration/problems remembering              | Cognitive symptom           |
| Acne/skin breakouts                                  | Physical symptom            |
| Changes to/difficulties breathing                    | Physical symptom            |
| Temperature fluctuations                             | Physical symptom            |
| Bloating/increased gas                               | Physical symptom            |
| Breast pain/tenderness                               | Physical symptom            |

## References

Ronca, F., Blodgett, J.M., Bruinvels, G., Lowery, M., Raviraj, M., Sandhar, G., Symeonides, N., Jones, C., Loosemore, M. and Burgess, P.W., 2025. Attentional, anticipatory and spatial cognition fluctuate throughout the menstrual cycle: Potential implications for female sport. *Neuropsychologia*, 206, p.108909.

Bruinvels, G., Goldsmith, E., Blagrove, R., Simpkin, A., Lewis, N., Morton, K., Suppiah, A., Rogers, J.P., Ackerman, K.E., Newell, J., Pedlar, C., 2021. Prevalence and frequency of menstrual cycle symptoms are associated with availability to train and compete: a study of 6812 exercising women recruited using the Strava exercise app. *Br. J. Sports Med.* 55 (8), 438–443.

**Supplemental Table 1. Reaction times  $\pm$  standard deviations for the simple reaction time task, sustained attention task and inhibition task for each self-reported athletic level and each phase.**

Statistical outputs from ANOVAs are included in Supplemental Table 2 on the next page.

|                                        | Menstruation  | Follicular    | Ovulation     | Luteal        |
|----------------------------------------|---------------|---------------|---------------|---------------|
| Simple Reaction Time (ms)              |               |               |               |               |
| Inactive                               | 327 $\pm$ 54  | 366 $\pm$ 94  | 381 $\pm$ 88  | 366 $\pm$ 85  |
| Active                                 | 305 $\pm$ 52  | 294 $\pm$ 35  | 291 $\pm$ 43  | 306 $\pm$ 55  |
| Competing                              | 332 $\pm$ 69  | 347 $\pm$ 136 | 338 $\pm$ 71  | 307 $\pm$ 56  |
| Elite                                  | 316 $\pm$ 76  | 358 $\pm$ 119 | 297 $\pm$ 35  | 376 $\pm$ 159 |
| Sustained Attention Reaction Time (ms) |               |               |               |               |
| Inactive                               | 552 $\pm$ 86  | 644 $\pm$ 178 | 557 $\pm$ 108 | 574 $\pm$ 93  |
| Active                                 | 488 $\pm$ 112 | 471 $\pm$ 64  | 455 $\pm$ 65  | 485 $\pm$ 126 |
| Competing                              | 541 $\pm$ 121 | 489 $\pm$ 70  | 486 $\pm$ 54  | 484 $\pm$ 85  |
| Elite                                  | 532 $\pm$ 127 | 517 $\pm$ 94  | 448 $\pm$ 39  | 604 $\pm$ 191 |
| Inhibition Reaction Time (ms)          |               |               |               |               |
| Inactive                               | 407 $\pm$ 66  | 432 $\pm$ 82  | 429 $\pm$ 73  | 438 $\pm$ 55  |
| Active                                 | 375 $\pm$ 60  | 381 $\pm$ 73  | 360 $\pm$ 67  | 384 $\pm$ 76  |
| Competing                              | 429 $\pm$ 92  | 410 $\pm$ 85  | 397 $\pm$ 55  | 402 $\pm$ 60  |
| Elite                                  | 456 $\pm$ 149 | 457 $\pm$ 143 | 394 $\pm$ 62  | 521 $\pm$ 218 |

**Supplemental Table 2. Statistical outputs for ANOVA and contrast analyses for reaction times in the simple reaction time, sustained attention, and inhibition tasks.**

| <b>Simple Reaction Time - ANOVA</b> |                       |                               |              |              |             |             |                              |
|-------------------------------------|-----------------------|-------------------------------|--------------|--------------|-------------|-------------|------------------------------|
|                                     | <b>Sum of Squares</b> | <b>Mean<sup>2</sup> Error</b> | <b>NumDF</b> | <b>DenDF</b> | <b>F</b>    | <b>p</b>    | <b><math>\eta^2_p</math></b> |
| <b>Phase</b>                        | <b>80110</b>          | <b>26703</b>                  | <b>3</b>     | <b>150</b>   | <b>4.06</b> | <b>.008</b> | <b>.02</b>                   |
| <b>Group</b>                        | <b>88126</b>          | <b>29375</b>                  | <b>3</b>     | <b>50</b>    | <b>4.47</b> | <b>.007</b> | <b>.16</b>                   |
| <b>Phase*Group</b>                  | <b>169531</b>         | <b>18837</b>                  | <b>9</b>     | <b>150</b>   | <b>2.87</b> | <b>.004</b> | <b>.09</b>                   |

  

| <b>Main effect of Phase contrasts</b> | <b>Estimate</b> | <b>SE</b>    | <b>df</b>  | <b>t.ratio</b> | <b>p</b>   |
|---------------------------------------|-----------------|--------------|------------|----------------|------------|
| Follicular – Luteal                   | -6.44           | 16.10        | 150        | -.40           | .98        |
| Follicular – Menstruation             | 1.76            | 16.10        | 150        | .11            | .99        |
| <b>Follicular – Ovulation</b>         | <b>43.87</b>    | <b>16.10</b> | <b>150</b> | <b>2.72</b>    | <b>.04</b> |
| Luteal – Menstruation                 | 8.20            | 16.10        | 150        | .51            | .96        |
| <b>Luteal – Ovulation</b>             | <b>50.32</b>    | <b>16.10</b> | <b>150</b> | <b>3.12</b>    | <b>.01</b> |
| Menstruation - Ovulation              | 42.11           | 16.10        | 150        | 2.61           | .048       |

  

| <b>Main effect of Group contrasts</b> | <b>Estimate</b> | <b>SE</b>    | <b>df</b> | <b>t.ratio</b> | <b>p</b>    |
|---------------------------------------|-----------------|--------------|-----------|----------------|-------------|
| <b>Inactive – Active</b>              | <b>106.50</b>   | <b>29.70</b> | <b>50</b> | <b>3.59</b>    | <b>.004</b> |
| Inactive – Competing                  | 81.40           | 34.80        | 50        | 2.34           | .10         |
| Inactive – Elite                      | 55.80           | 33.20        | 50        | 1.68           | .34         |
| Active – Competing                    | -25.10          | 31.50        | 50        | -.79           | .86         |
| Active – Elite                        | -50.60          | 29.70        | 50        | -1.71          | .33         |
| Competing – Elite                     | -25.50          | 34.80        | 50        | -.73           | .88         |

  

| <b>Contrasts; Inactive Group</b> | <b>Estimate</b> | <b>SE</b>    | <b>df</b>  | <b>t.ratio</b> | <b>p</b>    |
|----------------------------------|-----------------|--------------|------------|----------------|-------------|
| Follicular – Luteal              | 70.02           | 33.10        | 150        | 2.12           | .15         |
| <b>Follicular – Menstruation</b> | <b>91.62</b>    | <b>33.10</b> | <b>150</b> | <b>2.77</b>    | <b>.03</b>  |
| <b>Follicular – Ovulation</b>    | <b>86.98</b>    | <b>33.10</b> | <b>150</b> | <b>2.63</b>    | <b>.045</b> |
| Luteal – Menstruation            | 21.60           | 33.10        | 150        | .65            | .91         |
| Luteal – Ovulation               | 16.96           | 33.10        | 150        | .51            | .96         |
| Menstruation - Ovulation         | -4.65           | 33.10        | 150        | -.14           | .99         |

  

| <b>Contrasts; Active Group</b> | <b>Estimate</b> | <b>SE</b> | <b>df</b> | <b>t.ratio</b> | <b>p</b> |
|--------------------------------|-----------------|-----------|-----------|----------------|----------|
| Follicular – Luteal            | -13.67          | 25.60     | 150       | -.53           | .95      |
| Follicular – Menstruation      | -17.14          | 25.60     | 150       | -.67           | .91      |
| Follicular – Ovulation         | 16.31           | 25.60     | 150       | .64            | .92      |
| Luteal – Menstruation          | -3.47           | 25.60     | 150       | -.14           | .99      |
| Luteal – Ovulation             | 29.98           | 25.60     | 150       | 1.17           | .65      |
| Menstruation - Ovulation       | 33.45           | 25.60     | 150       | 1.31           | .56      |

  

| <b>Contrasts; Competing Group</b> | <b>Estimate</b> | <b>SE</b> | <b>df</b> | <b>t.ratio</b> | <b>p</b> |
|-----------------------------------|-----------------|-----------|-----------|----------------|----------|
| Follicular – Luteal               | 4.84            | 36.30     | 150       | .13            | .99      |
| Follicular – Menstruation         | -52.43          | 36.30     | 150       | -1.45          | .37      |
| Follicular – Ovulation            | 3.12            | 36.30     | 150       | .09            | .99      |
| Luteal – Menstruation             | -57.27          | 36.30     | 150       | -1.58          | .39      |
| Luteal – Ovulation                | -1.73           | 36.30     | 150       | -.05           | 1.00     |
| Menstruation - Ovulation          | 55.55           | 36.30     | 150       | 1.53           | .42      |

| <b>Contrasts; Elite Group</b> | <b>Estimate</b> | <b>SE</b>    | <b>df</b>  | <b>t.ratio</b> | <b>p</b>        |
|-------------------------------|-----------------|--------------|------------|----------------|-----------------|
| Follicular – Luteal           | -86.96          | 33.10        | 150        | -2.63          | .046            |
| Follicular – Menstruation     | -15.02          | 33.10        | 150        | -.45           | .97             |
| Follicular – Ovulation        | 69.09           | 33.10        | 150        | 2.09           | .16             |
| Luteal – Menstruation         | 71.94           | 33.10        | 150        | 2.17           | .14             |
| <b>Luteal – Ovulation</b>     | <b>156.05</b>   | <b>33.10</b> | <b>150</b> | <b>4.72</b>    | <b>&lt;.001</b> |
| Menstruation - Ovulation      | 84.11           | 33.10        | 150        | 2.54           | .06             |

  

| <b>Contrasts; Follicular Phase</b> | <b>Estimate</b> | <b>SE</b>    | <b>df</b>  | <b>t.ratio</b> | <b>p</b>     |
|------------------------------------|-----------------|--------------|------------|----------------|--------------|
| <b>Inactive – Active</b>           | <b>172.27</b>   | <b>39.20</b> | <b>129</b> | <b>4.39</b>    | <b>.0001</b> |
| <b>Inactive – Competing</b>        | <b>154.63</b>   | <b>46.00</b> | <b>129</b> | <b>3.36</b>    | <b>.006</b>  |
| <b>Inactive – Elite</b>            | <b>126.23</b>   | <b>43.80</b> | <b>129</b> | <b>2.88</b>    | <b>.02</b>   |
| Active – Competing                 | -17.63          | 41.60        | 129        | -.42           | .97          |
| Active – Competing                 | -46.04          | 39.20        | 129        | -1.17          | .64          |
| Competing – Elite                  | -28.41          | 46.00        | 129        | -.62           | .93          |

  

| <b>Contrasts; Luteal Phase</b> | <b>Estimate</b> | <b>SE</b>    | <b>df</b>  | <b>t.ratio</b> | <b>p</b>    |
|--------------------------------|-----------------|--------------|------------|----------------|-------------|
| Inactive – Active              | 88.56           | 39.20        | 129        | 2.23           | .11         |
| Inactive – Competing           | 89.46           | 46.00        | 129        | 1.95           | .21         |
| Inactive – Elite               | -30.76          | 43.80        | 129        | -.70           | .90         |
| Active – Competing             | .88             | 41.60        | 129        | .02            | 1.00        |
| <b>Active – Elite</b>          | <b>-119.34</b>  | <b>39.20</b> | <b>129</b> | <b>-3.04</b>   | <b>.02</b>  |
| <b>Competing – Elite</b>       | <b>-120.21</b>  | <b>46.00</b> | <b>129</b> | <b>-2.61</b>   | <b>.049</b> |

  

| <b>Contrasts; Menstruation Phase</b> | <b>Estimate</b> | <b>SE</b> | <b>df</b> | <b>t.ratio</b> | <b>p</b> |
|--------------------------------------|-----------------|-----------|-----------|----------------|----------|
| Inactive – Active                    | 63.50           | 39.20     | 129       | 1.62           | .37      |
| Inactive – Competing                 | 10.58           | 46.00     | 129       | .23            | .99      |
| Inactive – Elite                     | 19.58           | 43.80     | 129       | .45            | .97      |
| Active – Competing                   | -52.92          | 41.60     | 129       | -1.27          | .58      |
| Active – Elite                       | -43.92          | 39.20     | 129       | -1.12          | .68      |
| Competing – Elite                    | 9.00            | 46.00     | 129       | .20            | .99      |

  

| <b>Contrasts; Ovulation Phase</b> | <b>Estimate</b> | <b>SE</b>    | <b>df</b>  | <b>t.ratio</b> | <b>p</b>   |
|-----------------------------------|-----------------|--------------|------------|----------------|------------|
| <b>Inactive – Active</b>          | <b>101.60</b>   | <b>39.20</b> | <b>129</b> | <b>2.59</b>    | <b>.05</b> |
| Inactive – Competing              | 70.77           | 46.00        | 129        | 1.54           | .42        |
| Inactive – Elite                  | 108.34          | 43.80        | 129        | 2.47           | .07        |
| Active – Competing                | -30.82          | 41.60        | 129        | -.74           | .88        |
| Active – Elite                    | 6.74            | 39.20        | 129        | .17            | .99        |
| Competing – Elite                 | 37.56           | 46.00        | 129        | .82            | .85        |

| <b>Sustained Attention - ANOVA</b> |                       |                               |              |              |             |             |                              |
|------------------------------------|-----------------------|-------------------------------|--------------|--------------|-------------|-------------|------------------------------|
|                                    | <b>Sum of Squares</b> | <b>Mean<sup>2</sup> Error</b> | <b>NumDF</b> | <b>DenDF</b> | <b>F</b>    | <b>p</b>    | <b><math>\eta^2_p</math></b> |
| <b>Phase</b>                       | <b>80110</b>          | <b>26703</b>                  | <b>3</b>     | <b>150</b>   | <b>4.06</b> | <b>.008</b> | <b>.08</b>                   |
| <b>Group</b>                       | <b>88126</b>          | <b>29375</b>                  | <b>3</b>     | <b>50</b>    | <b>4.47</b> | <b>.007</b> | <b>.21</b>                   |
| <b>Phase*Group</b>                 | <b>169531</b>         | <b>18837</b>                  | <b>9</b>     | <b>150</b>   | <b>2.87</b> | <b>.004</b> | <b>.15</b>                   |

  

| <b>Main effect of Phase Contrasts</b> | <b>Estimate</b> | <b>SE</b>    | <b>df</b>  | <b>t.ratio</b> | <b>p</b>   | <b>d<sub>z</sub></b> |
|---------------------------------------|-----------------|--------------|------------|----------------|------------|----------------------|
| Follicular – Luteal                   | -6.44           | 16.10        | 150        | -.40           | .98        |                      |
| Follicular – Menstruation             | 1.76            | 16.10        | 150        | .11            | .99        |                      |
| <b>Follicular – Ovulation</b>         | <b>43.87</b>    | <b>16.10</b> | <b>150</b> | <b>2.72</b>    | <b>.04</b> |                      |
| Luteal – Menstruation                 | 8.20            | 16.10        | 150        | .51            | .96        |                      |
| <b>Luteal – Ovulation</b>             | <b>50.32</b>    | <b>16.10</b> | <b>150</b> | <b>3.12</b>    | <b>.01</b> |                      |
| Menstruation - Ovulation              | 42.11           | 16.10        | 150        | 2.61           | .048       |                      |

  

| <b>Main effect of Group Contrasts</b> | <b>Estimate</b> | <b>SE</b> | <b>df</b> | <b>t.ratio</b> | <b>p</b> |
|---------------------------------------|-----------------|-----------|-----------|----------------|----------|
| Inactive – Active                     | 106.50          | 29.70     | 50        | 3.59           | .004     |
| Inactive – Competing                  | 81.40           | 34.80     | 50        | 2.34           | .10      |
| Inactive – Elite                      | 55.80           | 33.20     | 50        | 1.68           | .34      |
| Active – Competing                    | -25.10          | 31.50     | 50        | -.80           | .86      |
| Active – Elite                        | -50.60          | 29.70     | 50        | -1.71          | .33      |
| Competing – Elite                     | -25.50          | 34.80     | 50        | -.73           | .88      |

  

| <b>Contrasts; Inactive Group</b> | <b>Estimate</b> | <b>SE</b>    | <b>df</b>  | <b>t.ratio</b> | <b>p</b>    |
|----------------------------------|-----------------|--------------|------------|----------------|-------------|
| Follicular – Luteal              | 70.02           | 33.10        | 150        | 2.12           | .15         |
| <b>Follicular – Menstruation</b> | <b>91.62</b>    | <b>33.10</b> | <b>150</b> | <b>2.77</b>    | <b>.03</b>  |
| <b>Follicular – Ovulation</b>    | <b>86.98</b>    | <b>33.10</b> | <b>150</b> | <b>2.63</b>    | <b>.046</b> |
| Luteal – Menstruation            | 21.60           | 33.10        | 150        | .65            | .91         |
| Luteal – Ovulation               | 16.96           | 33.10        | 150        | .51            | .96         |
| Menstruation - Ovulation         | -4.65           | 33.10        | 150        | -.14           | .99         |

  

| <b>Contrasts; Active Group</b> | <b>Estimate</b> | <b>SE</b> | <b>df</b> | <b>t.ratio</b> | <b>p</b> |
|--------------------------------|-----------------|-----------|-----------|----------------|----------|
| Follicular – Luteal            | -13.67          | 25.60     | 150       | -.53           | .95      |
| Follicular – Menstruation      | -17.14          | 25.60     | 150       | -.67           | .91      |
| Follicular – Ovulation         | 16.31           | 25.60     | 150       | .64            | .92      |
| Luteal – Menstruation          | -3.47           | 25.60     | 150       | -.14           | .99      |
| Luteal – Ovulation             | 29.98           | 25.60     | 150       | 1.17           | .65      |
| Menstruation - Ovulation       | 33.45           | 25.60     | 150       | 1.31           | .56      |

  

| <b>Contrasts; Competing Group</b> | <b>Estimate</b> | <b>SE</b> | <b>df</b> | <b>t.ratio</b> | <b>p</b> |
|-----------------------------------|-----------------|-----------|-----------|----------------|----------|
| Follicular – Luteal               | 4.84            | 36.30     | 150       | .13            | .99      |
| Follicular – Menstruation         | -52.43          | 36.30     | 150       | -1.45          | .47      |
| Follicular – Ovulation            | 3.12            | 36.30     | 150       | .09            | .99      |
| Luteal – Menstruation             | -57.27          | 36.30     | 150       | -1.58          | .39      |
| Luteal – Ovulation                | -1.73           | 36.30     | 150       | -.05           | 1.00     |
| Menstruation - Ovulation          | 55.55           | 36.30     | 150       | 1/53           | .42      |

  

| <b>Contrasts; Elite Group</b> | <b>Estimate</b> | <b>SE</b>    | <b>df</b>  | <b>t.ratio</b> | <b>p</b>        |
|-------------------------------|-----------------|--------------|------------|----------------|-----------------|
| <b>Follicular – Luteal</b>    | <b>-86.96</b>   | <b>33.10</b> | <b>150</b> | <b>-2.63</b>   | <b>.046</b>     |
| Follicular – Menstruation     | -15.02          | 33.10        | 150        | -.46           | .97             |
| Follicular – Ovulation        | 69.09           | 33.10        | 150        | 2.09           | .16             |
| Luteal – Menstruation         | 71.94           | 33.10        | 150        | 2.17           | .14             |
| <b>Luteal – Ovulation</b>     | <b>156.05</b>   | <b>33.10</b> | <b>150</b> | <b>4.72</b>    | <b>&lt;.001</b> |
| Menstruation - Ovulation      | 84/11           | 33.10        | 150        | 2.54           | .06             |

| <b>Contrasts; Follicular Phase</b>   | <b>Estimate</b> | <b>SE</b>    | <b>df</b>  | <b>t.ratio</b> | <b>p</b>     |
|--------------------------------------|-----------------|--------------|------------|----------------|--------------|
| <b>Inactive – Active</b>             | <b>172.27</b>   | <b>39.20</b> | <b>129</b> | <b>4.39</b>    | <b>.0001</b> |
| <b>Inactive – Competing</b>          | <b>154.63</b>   | <b>46.00</b> | <b>129</b> | <b>3.36</b>    | <b>.006</b>  |
| <b>Inactive – Elite</b>              | <b>126.23</b>   | <b>43.80</b> | <b>129</b> | <b>2.88</b>    | <b>.02</b>   |
| Active – Competing                   | -17.63          | 41.60        | 129        | -.42           | .97          |
| Active – Elite                       | -46.04          | 39.20        | 129        | -1.17          | .64          |
| Competing – Elite                    | -28.41          | 46.00        | 129        | -.62           | .93          |
| <b>Contrasts; Luteal Phase</b>       | <b>Estimate</b> | <b>SE</b>    | <b>df</b>  | <b>t.ratio</b> | <b>p</b>     |
| Inactive – Active                    | 88.58           | 39.20        | 129        | 2.26           | .11          |
| Inactive – Competing                 | 89.46           | 46.00        | 129        | 1.95           | .21          |
| Inactive – Elite                     | -30.76          | 43.80        | 129        | -.70           | .90          |
| Active – Competing                   | .88             | 41.60        | 129        | .02            | 1.00         |
| <b>Active – Elite</b>                | <b>-119.36</b>  | <b>39.20</b> | <b>129</b> | <b>-3.04</b>   | <b>.01</b>   |
| Competing – Elite                    | -120.21         | 46.00        | 129        | -2.61          | .048         |
| <b>Contrasts; Menstruation Phase</b> | <b>Estimate</b> | <b>SE</b>    | <b>df</b>  | <b>t.ratio</b> | <b>p</b>     |
| Inactive – Active                    | 63.50           | 39.20        | 129        | 1.62           | .37          |
| Inactive – Competing                 | 10.58           | 46.00        | 129        | .23            | .99          |
| Inactive – Elite                     | 19.58           | 43.80        | 129        | .45            | .97          |
| Active – Competing                   | -52.92          | 41.60        | 129        | -1.27          | .58          |
| Active – Elite                       | -43.92          | 39.20        | 129        | -1.12          | .68          |
| Competing – Elite                    | 9.00            | 46.00        | 129        | .20            | .99          |
| <b>Contrasts; Ovulation Phase</b>    | <b>Estimate</b> | <b>SE</b>    | <b>df</b>  | <b>t.ratio</b> | <b>p</b>     |
| <b>Inactive – Active</b>             | <b>101.60</b>   | <b>39.20</b> | <b>129</b> | <b>2.59</b>    | <b>.05</b>   |
| Inactive – Competing                 | 70.77           | 46.00        | 129        | 1.54           | .42          |
| Inactive – Elite                     | 108.34          | 43.80        | 129        | 2.47           | .07          |
| Active – Competing                   | -30.82          | 41.60        | 129        | -.74           | .88          |
| Active – Elite                       | 6.74            | 39.20        | 129        | .17            | .99          |
| Competing – Elite                    | 37.56           | 46.00        | 129        | .82            | .85          |

| <b>Inhibition - ANOVA</b> |                       |                               |              |              |             |             |                              |
|---------------------------|-----------------------|-------------------------------|--------------|--------------|-------------|-------------|------------------------------|
|                           | <b>Sum of Squares</b> | <b>Mean<sup>2</sup> Error</b> | <b>NumDF</b> | <b>DenDF</b> | <b>F</b>    | <b>p</b>    | <b><math>\eta^2_p</math></b> |
| <b>Phase</b>              | <b>43417</b>          | <b>14472.30</b>               | <b>3</b>     | <b>150</b>   | <b>4.31</b> | <b>.006</b> | <b>.08</b>                   |
| <b>Group</b>              | <b>27666</b>          | <b>9222.10</b>                | <b>3</b>     | <b>50</b>    | <b>2.75</b> | <b>.05</b>  | <b>.14</b>                   |
| <b>Phase*Group</b>        | <b>71043</b>          | <b>7893.70</b>                | <b>9</b>     | <b>150</b>   | <b>2.35</b> | <b>.02</b>  | <b>.12</b>                   |

  

| <b>Main effect of Phase Contrasts</b> | <b>Estimate</b> | <b>SE</b>    | <b>df</b>  | <b>t.ratio</b> | <b>p</b>    |
|---------------------------------------|-----------------|--------------|------------|----------------|-------------|
| Follicular – Luteal                   | -16.30          | 11.50        | 150        | -1.41          | .49         |
| Follicular – Menstruation             | 3.12            | 11.50        | 150        | .27            | .99         |
| Follicular – Ovulation                | 24.86           | 11.50        | 150        | 2.16           | .14         |
| Luteal – Menstruation                 | 19.42           | 11.50        | 150        | 1.69           | .33         |
| <b>Luteal – Ovulation</b>             | <b>41.16</b>    | <b>11.50</b> | <b>150</b> | <b>3.57</b>    | <b>.003</b> |
| Menstruation - Ovulation              | 21.74           | 11.50        | 150        | 1.89           | .23         |

  

| <b>Main effect of Group Contrasts</b> | <b>Estimate</b> | <b>SE</b>    | <b>df</b> | <b>t.ratio</b> | <b>p</b>   |
|---------------------------------------|-----------------|--------------|-----------|----------------|------------|
| Inactive – Active                     | 51.20           | 29.50        | 50        | 1.73           | .32        |
| Inactive – Competing                  | 17.00           | 34.60        | 50        | .49            | .96        |
| Inactive – Elite                      | -30.60          | 33.00        | 50        | .93            | .79        |
| Active – Competing                    | -34.20          | 31.30        | 50        | -1.09          | .70        |
| <b>Active – Competing</b>             | <b>-81.90</b>   | <b>29.50</b> | <b>50</b> | <b>-2.77</b>   | <b>.04</b> |
| Competing – Elite                     | -47.60          | 34.60        | 50        | -1.38          | .52        |

  

| <b>Contrasts; Inactive Group</b> | <b>Estimate</b> | <b>SE</b> | <b>df</b> | <b>t.ratio</b> | <b>p</b> |
|----------------------------------|-----------------|-----------|-----------|----------------|----------|
| Follicular – Luteal              | -5.88           | 23.60     | 150       | -.25           | .99      |
| Follicular – Menstruation        | 24.16           | 23.60     | 150       | 1.02           | .74      |
| Follicular – Ovulation           | 2.52            | 23.60     | 150       | .11            | .99      |
| Luteal – Menstruation            | 30.04           | 23.60     | 150       | 1.27           | .58      |
| Luteal – Ovulation               | 8.40            | 23.60     | 150       | .36            | .98      |
| Menstruation - Ovulation         | -21.64          | 23.60     | 150       | -.92           |          |

  

| <b>Contrasts; Active Group</b> | <b>Estimate</b> | <b>SE</b> | <b>df</b> | <b>t.ratio</b> | <b>p</b> |
|--------------------------------|-----------------|-----------|-----------|----------------|----------|
| Follicular – Luteal            | -3.21           | 18.30     | 150       | -.18           | .99      |
| Follicular – Menstruation      | 6.16            | 18.30     | 150       | .34            | .99      |
| Follicular – Ovulation         | 21.08           | 18.30     | 150       | 1.15           | .66      |
| Luteal – Menstruation          | 9.29            | 18.30     | 150       | .51            | .96      |
| Luteal – Ovulation             | 24.29           | 18.30     | 150       | 1.33           | .55      |
| Menstruation - Ovulation       | 14.92           | 18.30     | 150       | .82            | .85      |

  

| <b>Contrasts; Competing Group</b> | <b>Estimate</b> | <b>SE</b> | <b>df</b> | <b>t.ratio</b> | <b>p</b> |
|-----------------------------------|-----------------|-----------|-----------|----------------|----------|
| Follicular – Luteal               | 8.25            | 25.90     | 150       | .32            | .9       |
| Follicular – Menstruation         | -18.32          | 25.90     | 150       | -.71           | .89      |
| Follicular – Ovulation            | 13.71           | 25.90     | 150       | .53            | .95      |
| Luteal – Menstruation             | -26.57          | 25.90     | 150       | -1.03          | .73      |
| Luteal – Ovulation                | 5.46            | 25.90     | 150       | .21            | .99      |
| Menstruation - Ovulation          | 32.03           | 25.90     | 150       | 1.24           | .60      |

  

| <b>Contrasts; Elite Group</b>   | <b>Estimate</b> | <b>SE</b>    | <b>df</b>  | <b>t.ratio</b> | <b>p</b>        |
|---------------------------------|-----------------|--------------|------------|----------------|-----------------|
| <b>Follicular – Luteal</b>      | <b>-64.35</b>   | <b>23.60</b> | <b>150</b> | <b>-2.72</b>   | <b>.04</b>      |
| Follicular – Menstruation       | .48             | 23.60        | 150        | .02            | 1.00            |
| <b>Follicular – Ovulation</b>   | <b>62.14</b>    | <b>23.60</b> | <b>150</b> | <b>2.63</b>    | <b>.046</b>     |
| <b>Luteal – Menstruation</b>    | <b>64.83</b>    | <b>23.60</b> | <b>150</b> | <b>2.74</b>    | <b>.03</b>      |
| <b>Luteal – Ovulation</b>       | <b>126.49</b>   | <b>23.60</b> | <b>150</b> | <b>5.35</b>    | <b>&lt;.001</b> |
| <b>Menstruation - Ovulation</b> | <b>61.67</b>    | <b>23.60</b> | <b>150</b> | <b>2.61</b>    | <b>.048</b>     |

| <b>Contrasts; Follicular Phase</b> | <b>Estimate</b> | <b>SE</b> | <b>df</b> | <b>t.ratio</b> | <b>p</b> |
|------------------------------------|-----------------|-----------|-----------|----------------|----------|
| Inactive – Active                  | 50.43           | 34.80     | 91.30     | 1.45           | .47      |
| Inactive – Competing               | 21.30           | 40.80     | 91.30     | .52            | .95      |
| Inactive – Elite                   | -25.00          | 38.90     | 91.30     | -.64           | .92      |
| Active – Competing                 | -29.13          | 36.90     | 91.30     | -.79           | .86      |
| Active – Elite                     | -75.43          | 34.80     | 91.30     | -2.17          | .14      |
| Competing – Elite                  | -46.30          | 40.80     | 91.30     | -1.14          | .67      |

  

| <b>Contrasts; Luteal Phase</b> | <b>Estimate</b> | <b>SE</b>    | <b>Df</b>    | <b>t.ratio</b> | <b>p</b>   |
|--------------------------------|-----------------|--------------|--------------|----------------|------------|
| Inactive – Active              | 53.09           | 34.80        | 91.30        | 1.53           | .43        |
| Inactive – Competing           | 35.43           | 40.80        | 91.30        | .87            | .82        |
| Inactive – Elite               | -83.47          | 38.90        | 91.30        | -2.15          | .15        |
| Active – Competing             | -17.67          | 36.90        | 91.30        | -.48           | .96        |
| Active – Elite                 | -136.56         | 34.80        | 91.30        | -3.93          | .0009      |
| <b>Competing – Elite</b>       | <b>-118.90</b>  | <b>40.80</b> | <b>91.30</b> | <b>-2.92</b>   | <b>.02</b> |

  

| <b>Contrasts; Menstruation Phase</b> | <b>Estimate</b> | <b>SE</b> | <b>df</b> | <b>t.ratio</b> | <b>p</b> |
|--------------------------------------|-----------------|-----------|-----------|----------------|----------|
| Inactive – Active                    | 32.42           | 34.80     | 91.30     | .93            | .79      |
| Inactive – Competing                 | -21.18          | 40.80     | 91.30     | -.52           | .95      |
| Inactive – Elite                     | -48.68          | 38.90     | 91.30     | -1.25          | .60      |
| Active – Competing                   | -53.60          | 36.90     | 91.30     | -1.45          | .47      |
| Active – Elite                       | -81.11          | 34.80     | 91.30     | -2.33          | .10      |
| Competing – Elite                    | -27.50          | 40.80     | 91.30     | -.68           | .91      |

  

| <b>Contrasts; Ovulation Phase</b> | <b>Estimate</b> | <b>SE</b> | <b>df</b> | <b>t.ratio</b> | <b>p</b> |
|-----------------------------------|-----------------|-----------|-----------|----------------|----------|
| Inactive – Active                 | 68.98           | 34.80     | 91.30     | .98            | .20      |
| Inactive – Competing              | 32.49           | 40.80     | 91.30     | .80            | .86      |
| Inactive – Elite                  | 34.62           | 38.90     | 91.30     | .89            | .81      |
| Active – Competing                | -36.49          | 36.90     | 91.30     | -.99           | .76      |
| Active – Elite                    | -34.36          | 34.80     | 91.30     | -.99           | .76      |
| Competing – Elite                 | 2.13            | 40.80     | 91.30     | .05            | .99      |

**Supplemental Table 3. Number of errors  $\pm$  standard deviations for the sustained attention task and inhibition tasks, as well as spatial anticipation timing error (ms)  $\pm$  standard deviation for each self-reported athletic level and each phase.**

**Statistical outputs from ANOVAs are included in Supplemental Table 4 on the next page.**

|                                | Menstruation    | Follicular      | Ovulation       | Luteal          |
|--------------------------------|-----------------|-----------------|-----------------|-----------------|
| Sustained Attention Errors (n) |                 |                 |                 |                 |
| Inactive                       | .50 $\pm$ 2.27  | 2.00 $\pm$ 2.19 | .50 $\pm$ 2.52  | 3.58 $\pm$ 2.19 |
| Active                         | .20 $\pm$ 1.14  | .25 $\pm$ 1.59  | .20 $\pm$ 1.83  | .25 $\pm$ 1.69  |
| Competing                      | .60 $\pm$ 1.60  | .20 $\pm$ 1.07  | .10 $\pm$ .82   | .01 $\pm$ 1.10  |
| Elite                          | .33 $\pm$ 1.78  | 2.17 $\pm$ 1.95 | .17 $\pm$ .97   | .05 $\pm$ 1.11  |
| Inhibition Errors (n)          |                 |                 |                 |                 |
| Inactive                       | 2.33 $\pm$ 2.27 | 3.67 $\pm$ 2.19 | 3.00 $\pm$ 2.52 | 2.33 $\pm$ 2.19 |
| Active                         | 1.35 $\pm$ 1.14 | 1.70 $\pm$ 1.59 | 1.75 $\pm$ 1.83 | 1.70 $\pm$ 1.69 |
| Competing                      | 1.10 $\pm$ 1.60 | 1.40 $\pm$ 1.07 | .70 $\pm$ .82   | 1.10 $\pm$ 1.10 |
| Elite                          | 1.58 $\pm$ 1.78 | 1.83 $\pm$ 1.95 | .75 $\pm$ .97   | 1.17 $\pm$ 1.11 |
| Timing Error (ms)              |                 |                 |                 |                 |
| Inactive                       | 92 $\pm$ 58     | 108 $\pm$ 92    | 70 $\pm$ 23     | 77 $\pm$ 40     |
| Active                         | 62 $\pm$ 15     | 61 $\pm$ 14     | 69 $\pm$ 19     | 64 $\pm$ 29     |
| Competing                      | 55 $\pm$ 7      | 62 $\pm$ 20     | 59 $\pm$ 10     | 65 $\pm$ 31     |
| Elite                          | 68 $\pm$ 30     | 63 $\pm$ 27     | 62 $\pm$ 19     | 68 $\pm$ 27     |

**Supplemental Table 4. Statistical outputs for ANOVA and contrast analyses for sustained attention, and inhibition task errors, as well as timing errors.**

| Sustained Attention Errors     |                |                         |            |           |             |            |                             |
|--------------------------------|----------------|-------------------------|------------|-----------|-------------|------------|-----------------------------|
|                                | Sum of Squares | Mean <sup>2</sup> Error | NumDF      | DenDF     | F           | p          | η <sup>2</sup> <sub>p</sub> |
| Phase                          | 32.66          | 10.89                   | 3          | 150       | 1.85        | .14        | .04                         |
| <b>Group</b>                   | <b>60.76</b>   | <b>20.25</b>            | <b>3</b>   | <b>50</b> | <b>3.45</b> | <b>.02</b> | <b>.17</b>                  |
| Phase*Group                    | 82.40          | 9.16                    | 9          | 150       | 1.56        | .13        | .09                         |
| Main effect of Group contrasts |                | Estimate                | SE         | df        | t.ratio     | p          | d <sub>z</sub>              |
| <b>Inactive – Active</b>       |                | <b>1.42</b>             | <b>.48</b> | <b>50</b> | <b>2.99</b> | <b>.02</b> |                             |
| Inactive – Competing           |                | 1.42                    | .56        | 50        | 2.55        | .06        |                             |
| Inactive – Elite               |                | .85                     | .53        | 50        | 1.61        | .38        |                             |
| Active – Competing             |                | 0.00                    | .50        | 50        | 0.00        | 1.00       |                             |
| Active – Elite                 |                | -.57                    | .48        | 50        | -1.19       | .64        |                             |
| Competing – Elite              |                | -.57                    | .56        | 50        | -1.02       | .74        |                             |
|                                |                |                         |            |           |             |            |                             |
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| <b>Timing Errors</b> |                       |                               |              |              |             |            |                              |
|----------------------|-----------------------|-------------------------------|--------------|--------------|-------------|------------|------------------------------|
|                      | <b>Sum of Squares</b> | <b>Mean<sup>2</sup> Error</b> | <b>NumDF</b> | <b>DenDF</b> | <b>F</b>    | <b>p</b>   | <b><math>\eta^2_p</math></b> |
| Phase                | 1757.40               | 585.79                        | 3            | 150          | .68         | .56        | .01                          |
| <b>Group</b>         | <b>9154.70</b>        | <b>3051.56</b>                | <b>3</b>     | <b>50</b>    | <b>3.56</b> | <b>.02</b> | <b>.18</b>                   |
| Phase*Group          | 10884.20              | 1209.36                       | 9            | 150          | 1.41        | .19        | .08                          |

  

| <b>Main effect of Group contrasts</b> | <b>Estimate</b> | <b>SE</b>   | <b>df</b> | <b>t.ratio</b> | <b>p</b>   | <b>d<sub>z</sub></b> |
|---------------------------------------|-----------------|-------------|-----------|----------------|------------|----------------------|
| <b>Inactive – Active</b>              | <b>22.87</b>    | <b>8.06</b> | <b>50</b> | <b>2.84</b>    | <b>.03</b> |                      |
| <b>Inactive – Competing</b>           | <b>26.40</b>    | <b>9.45</b> | <b>50</b> | <b>2.79</b>    | <b>.04</b> |                      |
| Inactive – Elite                      | 21.37           | 9.01        | 50        | 2.37           | .10        |                      |
| Active – Competing                    | 3.53            | 8.55        | 50        | .41            | .98        |                      |
| Active – Elite                        | -1.50           | 8.06        | 50        | -.19           | .99        |                      |
| Competing – Elite                     | -5.03           | 9.45        | 50        | -.53           | .95        |                      |

**Supplemental Table 5. Number of participants (n = 41) reporting experiencing each symptom at each phase.**

| <b>Symptom</b>                                      | <b>Early follicular</b> | <b>Late follicular</b> | <b>Ovulation</b> | <b>Mid-luteal</b> |
|-----------------------------------------------------|-------------------------|------------------------|------------------|-------------------|
| <i>Brain fog</i>                                    | 10                      | 5                      | 5                | 8                 |
| <i>Cravings</i>                                     | 14                      | 2                      | 2                | 7                 |
| <i>Dizziness or poor coordination</i>               | 11                      | 1                      | 3                | 3                 |
| <i>Irritability</i>                                 | 13                      | 1                      | 2                | 6                 |
| <i>Migraine or headache</i>                         | 10                      | 6                      | 5                | 5                 |
| <i>Disrupted sleep</i>                              | 14                      | 6                      | 8                | 13                |
| <i>Poor concentration or memory</i>                 | 10                      | 5                      | 5                | 9                 |
| <i>Stress, anxiety or depression</i>                | 14                      | 5                      | 6                | 8                 |
| <b><i>Cognitive symptoms (any of the above)</i></b> | <b>34</b>               | <b>21</b>              | <b>18</b>        | <b>25</b>         |
| <i>Acne</i>                                         | 9                       | 9                      | 4                | 11                |
| <i>Bloating</i>                                     | 15                      | 2                      | 5                | 0                 |
| <i>Breast pain</i>                                  | 5                       | 0                      | 4                | 4                 |
| <i>Changes to breathing</i>                         | 1                       | 0                      | 0                | 2                 |
| <i>Constipation</i>                                 | 3                       | 0                      | 0                | 0                 |
| <i>Cramps</i>                                       | 33                      | 0                      | 2                | 1                 |
| <i>Diarrhoea</i>                                    | 6                       | 1                      | 3                | 1                 |
| <i>Fatigue</i>                                      | 21                      | 10                     | 9                | 15                |
| <i>Joint or muscle pain</i>                         | 5                       | 2                      | 1                | 1                 |
| <i>Lower back pain</i>                              | 20                      | 3                      | 2                | 2                 |
| <i>Nausea</i>                                       | 3                       | 0                      | 4                | 1                 |
| <i>Temperature fluctuations</i>                     | 7                       | 2                      | 2                | 2                 |
| <i>Water retention</i>                              | 9                       | 2                      | 5                | 2                 |
| <i>Weight gain</i>                                  | 5                       | 2                      | 3                | 3                 |
| <b><i>Physical symptoms (any of the above)</i></b>  | <b>39</b>               | <b>21</b>              | <b>21</b>        | <b>25</b>         |
| <b><i>No Symptoms</i></b>                           | <b>0</b>                | <b>17</b>              | <b>16</b>        | <b>10</b>         |