> Sleep quality in elite athletes: normative values, reliability and understanding contributors to poor sleep, Sports Medicine, Shona L. Halson, Rich D. Johnston, Renee N. Appaneal, Margot A. Rogers, Liam A. Toohey, Michael K. Drew, Charli Sargent, Gregory D. Roach. School of Behavioural and Health Sciences, Australian Catholic University; shona.halson@acu.edu.au

Supplementary Table A. Descriptive statistics (median and interquartile range) and percentage distribution of the Pittsburgh Sleep Quality Index (PSQI) items for male and female athletes.

| PSQI Items | Male ( $\mathrm{n}=108$ ) | Female ( $\mathrm{n}=371$ ) |
| :---: | :---: | :---: |
| 1. During the past two weeks, when have you usually gone to bed at night? (hrs:min) | 22:00 (21:30-22:30) | 22:00 (21:30-22:30) |
| 2. During the past two weeks, how long has it usually taken you to fall asleep each night? (min) | 15 (10-30) | 15 (10-30) |
| 3. During the past two weeks, when have you usually gotten up in the morning? (hrs:min) | 06:30 (05:30-07:00) | 07:00 (06:00-07:30) |
| 4. During the past two weeks, how many hours of actual sleep did you get at night? (hours) | 7.75 (7-8) | 8 (7-8.5) |

5. During the past two weeks, how often have you had trouble sleeping because:

- Cannot get to sleep within 30 minutes
$\begin{array}{lll}\text { None during the past two weeks (\%) } & 36.1 & 26.4\end{array}$
Less than once a week (\%) 29.6
Once or twice a week (\%) 29.6
27.8
$\begin{array}{lll}\text { Three or more times a week (\%) } & 4.6 & 15.9\end{array}$
- Wake up in the middle of the night or early morning

None during the past two weeks (\%) 28.7
20.5

Less than once a week (\%) 22.9
Once or twice a week (\%) 31
Three or more times a week (\%) 25.4

- Have to get up to use the bathroom
$\begin{array}{ll}\text { None during the past two weeks (\%) } 27.8 & 35\end{array}$
Less than once a week (\%) $24.1 \quad 20.2$
Once or twice a week (\%) $21.3 \quad 21.8$
$\begin{array}{lll}\text { Three or more times a week (\%) } & 26.9 & 22.9\end{array}$
- Cannot breathe comfortably
$\begin{array}{lll}\text { None during the past two weeks (\%) } & 90.7 & 86.5\end{array}$
Less than once a week (\%) 3.7
8.9
$\begin{array}{lll}\text { Once or twice a week (\%) } & 2.8 & 2.7\end{array}$
$\begin{array}{lll}\text { Three or more times a week (\%) } & 2.8 & 1.9\end{array}$
- Cough or snore loudly

None during the past two weeks (\%) 75
$\begin{array}{lll}\text { Less than once a week (\%) } & 9.3 & 11.6\end{array}$
$\begin{array}{lll}\text { Once or twice a week (\%) } & 11.1 & 5.7\end{array}$
Three or more times a week (\%) 4.6

- Feel too cold

None during the past two weeks (\%) $65.7 \quad 57.7$
Less than once a week (\%) 26.4
$\begin{array}{lll}\text { Once or twice a week (\%) } & 7.4 & 12.9\end{array}$
Three or more times a week (\%) $\quad 1.9$

- Feel too hot

None during the past two weeks (\%)

[^0]Less than once a week (\%) ..... 29.6 ..... 29.9
Once or twice a week (\%) ..... 18.5 ..... 24.8
Three or more times a week (\%) ..... 7.4 ..... 6.5- Had bad dreams
None during the past two weeks (\%) ..... 67.657.1
Less than once a week (\%) ..... 24.1 ..... 25.9
Once or twice a week (\%) ..... 5.6
Three or more times a week (\%) ..... 2.814

- Have painNone during the past two weeks (\%) 70.470.6
Less than once a week (\%) ..... 15.7 ..... 18.6
Once or twice a week (\%) ..... 9.3
Three or more times a week (\%) ..... 4.6 ..... 3.27.5
- Other reasons that have caused issues
No issue reported ..... 88 ..... 93.3
Issue reported ..... 12
- How often during the past two weeks have you had trouble
sleeping because of this?
None during the past two weeks (\%) ..... 15.46.7
Less than once a week (\%) ..... 30.7 ..... 24
Once or twice a week (\%) ..... 23.1 ..... 28
Three or more times a week (\%) ..... 30.7ing the past two weeks, how would you rate your overall sleepquality
Very good (\%) ..... 21.3 ..... 16.7
Fairly good (\%) ..... 69.4 ..... 69.8
Fairly bad (\%) ..... 8.3 ..... 11.9
Very bad (\%) ..... 0.91.6

7. During the past two weeks, how often have you taken medication to help you sleep
None during the past two weeks ..... 85.2 ..... 92.2
Less than once a week ..... 10.2 ..... 3.8
Once or twice a week ..... 2.8 ..... 2.7
Three or more times a week ..... 1.3
8. During the past two weeks, how often have you had trouble staying awake while driving, eating meals, or engaging in social activities?
None during the past two weeks (\%) ..... 67.6 ..... 57.7
Less than once a week (\%) ..... 20.4 ..... 21.3
Once or twice a week (\%) ..... 11.1
Three or more times a week (\%) ..... 0.9
Thee or more to ..... 3.517.5
9. During the past two weeks, how much has it been a problem for you to keep up enough enthusiasm to get things done?
$\begin{array}{ll}\text { No problem at all (\%) } & 44.4 \\ \text { Only a very slight problem (\%) } & 43.5\end{array}$ ..... 34.8
Only a very slight problem (\%) ..... 43.5 ..... 46.6

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\begin{aligned}
& \text { Sleep quality in elite athletes: normative values, reliability and understanding contributors to poor sleep, Sports Medicine, } \\
& \text { Shona L. Halson, Rich D. Johnston, Renee N. Appaneal, Margot A. Rogers, Liam A. Toohey, Michael K. Drew, Charli } \\
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& \text { shona.halson@acu.edu.au }
\end{aligned}
$$Somewhat of a problem (\%)10.215.6

A very big problem (\%) ..... 1.93
10. If you have a roommate or bed partner, ask him or her, how often inthe past two weeks have you had:

- Loud snoring
None during the past two weeks (\%) ..... 70.6 ..... 76.5
Less than once a week (\%) ..... 17.6 ..... 15.3
Once or twice a week (\%) ..... 5.9 ..... 5.9
Three or more times a week (\%) ..... 5.9 ..... 2.4
- Long pauses between breaths while asleep ..... 88.2 ..... 92.9
Less than once a week (\%) ..... 2 ..... 4.7
Once or twice a week (\%) ..... 7.8 ..... 1.2
Three or more times a week (\%) ..... 2 ..... 1.2
- Legs twitching or jerking while you sleep
None during the past two weeks (\%) ..... 25.5 ..... 38.8
Less than once a week (\%) ..... 21.6 ..... 21.2
Once or twice a week (\%) ..... 19.6 ..... 15.3
Three or more times a week (\%) ..... 33.3 ..... 24.7
- Episodes of disorientation or confusions during sleep
None during the past two weeks (\%) 80.4 ..... 77.6
Less than once a week (\%) ..... 13.7 ..... 10.6
Once or twice a week (\%) ..... 5.9 ..... 9.4
Three or more times a week (\%) ..... 0 ..... 2.4
- Other restlessness while you sleep please describe
None during the past two weeks (\%) 76.5 ..... 62.4
Less than once a week (\%) ..... 9.8 ..... 16.5
Once or twice a week (\%) ..... 11.8 ..... 10.6
Three or more times a week (\%) ..... 2

[^1]Supplementary Table B. Descriptive statistics (median and interquartile range) and percentage distribution of the Pittsburgh Sleep Quality Index (PSQI) items for team and individual sport athletes.

| PSQI Items | Team sport $(\mathrm{n}=298)$ | Individual sports $(\mathrm{n}=181)$ |
| :---: | :---: | :---: |
| 1. During the past two weeks, when have you usually gone to bed at night? (hrs:min) | 22:00 (22:00-22:30) | 22:00 (21:30-22:30) |
| 2. During the past two weeks, how long has it usually taken you to fall asleep each night? (min) | 20 (10 to 30) | 15 (10 to 28) |
| 3. During the past two weeks, when have you usually gotten up in the morning? (hrs:min) | 07:00 (06:30-07:30) | 06:00 (05:00-07:00) |
| 4. During the past two weeks, how many hours of actual sleep did you get at night? (hours) | 8 (7.5 to 9) | 7.5 (7 to 8) |
| 5. During the past two weeks, how often have you had trouble sleeping because: |  |  |
| - Cannot get to sleep within 30 minutes |  |  |
| None during the past two weeks (\%) | 24.2 | 35.9 |
| Less than once a week (\%) | 32.2 | 26 |
| Once or twice a week (\%) | 28.9 | 27.1 |
| Three or more times a week (\%) | 14.8 | 11 |
| - Wake up in the middle of the night or early morning |  |  |
| None during the past two weeks (\%) | 19.1 | 27.6 |
| Less than once a week (\%) | 24.2 | 22.7 |
| Once or twice a week (\%) | 29.2 | 30.9 |
| Three or more times a week (\%) | 27.5 | 18.8 |
| - Have to get up to use the bathroom |  |  |
| None during the past two weeks (\%) | 31.5 | 36.5 |
| Less than once a week (\%) | 22.8 | 18.8 |
| Once or twice a week (\%) | 22.5 | 20.4 |
| Three or more times a week (\%) | 23.2 | 24.9 |
| - Cannot breathe comfortably |  |  |
| None during the past two weeks (\%) | 87.2 | 87.8 |
| Less than once a week (\%) | 9.1 | 5.5 |
| Once or twice a week (\%) | 2.3 | 3.3 |
| Three or more times a week (\%) | 1.3 | 3.3 |
| - Cough or snore loudly |  |  |
| None during the past two weeks (\%) | 77.5 | 80.7 |
| Less than once a week (\%) | 12.1 | 9.4 |
| Once or twice a week (\%) | 7.4 | 6.1 |
| Three or more times a week (\%) | 3 | 3.9 |
| - Feel too cold |  |  |
| None during the past two weeks (\%) | 56.7 | 64.1 |
| Less than once a week (\%) | 27.5 | 23.8 |
| Once or twice a week (\%) | 13.4 | 8.8 |
| Three or more times a week (\%) | 2.3 | 3.3 |

- Feel too hot

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None during the past two weeks (\%) ..... 37.2 ..... 44.8
Less than once a week (\%) ..... 31.5 ..... 27.1
Once or twice a week (\%) ..... 25.8 ..... 19.3
Three or more times a week (\%) ..... 5.4 ..... 8.8

- Had bad dreams
None during the past two weeks (\%) ..... 56.4 ..... 64.6
Less than once a week (\%) ..... 25.5 ..... 25.4
Once or twice a week (\%) ..... 14.1 ..... 8.8
Three or more times a week (\%) ..... 4 ..... 1.1- Have painNone during the past two weeks (\%) 69.169.1Less than once a week (\%)18.572.9
17.1Once or twice a week (\%)8.4
Three or more times a week (\%) ..... 4 ..... 2.87.2- Other reasons that have caused issues
No issue reported ..... 93.3 ..... 90.1
Issue reported ..... 6.7 ..... 9.9- How often during the past two weeks have you had troublesleeping because of this?
None during the past two weeks (\%) ..... 15 ..... 5.6
Less than once a week (\%) ..... 26.7 ..... 33.3
Once or twice a week (\%) ..... 40 ..... 22.2
Three or more times a week (\%) ..... 46.7 ..... 38.8

6. During the past two weeks, how would you rate your overall sleep quality
Very good (\%) ..... 14.1 ..... 23.8
Fairly good (\%) ..... 74.2 ..... 62.4
Fairly bad (\%) ..... 10.7 ..... 11.6
Very bad (\%) ..... 1 ..... 2.2
7. During the past two weeks, how often have you takenmedication to help you sleep
None during the past two weeks ..... 89.9 ..... 91.7
Less than once a week ..... 5.7 ..... 4.4
Once or twice a week ..... 3.7 ..... 1.1
Three or more times a week ..... 0.7 ..... 2.8
8. During the past two weeks, how often have you had troublestaying awake while driving, eating meals, or engaging in socialactivities?
None during the past two weeks (\%) ..... 58.4 ..... 62.4
Less than once a week (\%) ..... 19.5 ..... 23.8
Once or twice a week (\%) ..... 19.1 ..... 11
Three or more times a week (\%) ..... 3 ..... 2.8
9. During the past two weeks, how much has it been a problem for you to keep up enough enthusiasm to get things done?

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| No problem at all (\%) | 33.9 | 42 |
| :--- | :---: | :---: |
| Only a very slight problem (\%) | 48 | 42.5 |
| Somewhat of a problem (\%) | 14.8 | 13.8 |
| A very big problem (\%) | 3.4 | 1.7 |

10. If you have a roommate or bed partner, ask him or her, how often in the past two weeks have you had:

- Loud snoring

None during the past two weeks (\%) $73.5 \quad 75.5$
Less than once a week (\%) $16.9 \quad 15.1$
$\begin{array}{lll}\text { Once or twice a week (\%) } & 6.7\end{array}$
$\begin{array}{lll}\text { Three or more times a week (\%) } & 3.6 & 3.8\end{array}$
$\begin{array}{lll}\text { - Long pauses between breaths while asleep } \\ \text { None during the past two weeks (\%) } & 90.4 & 92.5\end{array}$
$\begin{array}{lll}\text { Less than once a week (\%) } & 3.6 & 3.8\end{array}$
Once or twice a week (\%) 4.8
$1 . .9$
$\begin{array}{lll}\text { Three or more times a week (\%) } & 1.2 & 1.9\end{array}$

- Legs twitching or jerking while you sleep
$\begin{array}{ll}\text { None during the past two weeks (\%) } 33.7 & 34\end{array}$
$\begin{array}{lll}\text { Less than once a week (\%) } & 22.9 & 18.9\end{array}$
$\begin{array}{lll}\text { Once or twice a week (\%) } & 14.5 & 20.8\end{array}$
$\begin{array}{lll}\text { Three or more times a week (\%) } 28.9 & 26.4\end{array}$
$\begin{array}{lll}\text { - Episodes of disorientation or confusions during sleep } \\ \text { None during the past two weeks (\%) } & 72.3 & 88.7\end{array}$
$\begin{array}{lll}\text { Less than once a week (\%) } & 14.5 & 7.5\end{array}$
$\begin{array}{lll}\text { Once or twice a week (\%) } & 10.8 & 3.8\end{array}$
Three or more times a week (\%) 2.4
- Other restlessness while you sleep please describe

None during the past two weeks (\%) 71.7
Less than once a week (\%) $\quad 16.9$ 9.4
$\begin{array}{lll}\text { Once or twice a week (\%) } & 10.8 & 11.3\end{array}$
$\begin{array}{lll}\text { Three or more times a week (\%) } & 7.2 & 7.5\end{array}$
PSQI Items are scored and summed to form the seven components of the PSQI.


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