

# Sleep Health Awareness in Australia

The Australian Longitudinal Study on Women's Health submission to the Select Committee on sleep health awareness in Australia, Department of the Senate

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## Contents

Summary.....	2
1. The potential and known causes, impacts and costs (economic and social) of inadequate sleep and sleep disorders on the community.....	3
Prevalence of sleep disruption and impact of life stage .....	3
Predictors of sleeping difficulties .....	6
Health outcomes .....	7
Use of sleeping medications and health services .....	7
Implications .....	8
5. Current national research and investment into sleep health and sleeping disorders.....	10
Reference List.....	11
Enquiries.....	13
University of Newcastle: .....	13
www.alsw.org.au .....	13

## Summary

The Australian Longitudinal Study on Women's health is a national research resource for the development of policy and practice related to women's health and health services. It tracks the health and wellbeing of over 57,000 women across four generations including their sleep health. The study's data are freely available to collaborating researchers and policymakers. Since its inception in 1996, the study data have been used to assess sleep health in Australian women, and gain insight into the prevalence, determinants, and consequences of sleep difficulties. While sleeping difficulties are common across the life course, women's life stage plays a large part in sleep health. Women report sleep difficulties during pregnancy and motherhood, the menopause transition and old age.

Sleep difficulties are often persistent and with significant consequences for women's wellbeing. They are associated with poor mental health, disease, falls, and accidents. The relationship between sleep and mortality rates appears to be through the association between sleep problems and chronic disease and is likely to be multi-causal. Research into the role of sleep in obesity, mental health, the accumulation of chronic diseases and mortality is summarised in this submission.

Further research into sleep is ongoing with current projects investigating sleep in relationship to:

- Polycystic ovarian syndrome
- Pregnancy
- Insomnia and diet
- Use of medication for sleep difficulties
- Chronic and comorbid diseases
- The role of sleep in childhood obesity and the impact of screen time on sleep

Further analysis of linked survey and administrative data on Medicare use, medications, hospital admissions and aged care services and costs in relation to sleep problems is also possible.

On behalf of the study staff, and its hundreds of collaborating researchers, we welcome the Senate Inquiry into Sleep Health Awareness and are grateful for the opportunity to submit our research for consideration. This submission addresses questions 1 and 5 from the terms of reference.

- 1: The potential and known causes, impacts and costs (economic and social) of inadequate sleep and sleep disorders on the community
- 5: Current national research and investment into sleep health and sleeping disorders.

# 1. The potential and known causes, impacts and costs (economic and social) of inadequate sleep and sleep disorders on the community

## Prevalence of sleep disruption and impact of life stage

Table 1: Sleep problems reported by women at their first surveys across every birth cohort:

<b>1989-95 birth cohort</b>	<b>1973-78 birth cohort</b>	<b>1946-51 birth cohort</b>	<b>1921-26 birth cohort</b>
Survey 1 2013 (age 18-23)	Survey 1 1996 (age 18-23)	Survey 1 1996 (age 45-50)	Survey 1 1996 (age 70-75)
25% Difficulty sleeping - often 37% Difficulty sleeping - sometimes	10% Difficulty sleeping - often 24% Difficulty sleeping - sometimes	16% Difficulty sleeping - often 31% Difficulty sleeping - sometimes	16% Difficulty sleeping - often 32% Difficulty sleeping - sometimes
	50% Would like to spend more time sleeping	35% Would like to spend more time sleeping	21% Would like to spend more time sleeping

Statistics compiled from the following Australian Longitudinal Study on Women's Health Data Books, all retrieved from: <<http://www.alswh.org.au/for-researchers/data/data-books>>

Data Book for the 1989-95 Cohort (2018)

Data Book for the 1973-78 Cohort (2016)

Data Book for the 1946-51 Cohort (2018)

Data Book for the 1921-26 Cohort Surveys 1-6 (2016)

Table 2: Sleep problems reported by women at their most recent surveys across every birth cohort:

<b>1989-95 birth cohort</b>	<b>1973-78 birth cohort</b>	<b>1946-51 birth cohort</b>	<b>1921-26 birth cohort</b>
Survey 5 2018 (age 22-27)	Survey 7 2015 (age 37-42)	Survey 8 2016 (age 65-70)	Survey 6 2011 (age 85-90)
22% Difficulty sleeping - often 39% Difficulty sleeping - sometimes	17% Difficulty sleeping - often 34% Difficulty sleeping - sometimes		
	40% Difficulty falling asleep 52% Sleeping poorly 12% Sleep was restless most of the time (5-7 days) 19% Sleep was restless occasionally (3-4 days)	41% Difficulty falling asleep 50% sleeping poorly 14% Sleep was restless most of the time (5-7 days) 20% Sleep was restless occasionally (3-4 days)	
		56% Waking up in the early hours of the morning 17% Lying awake for most of the night 34% Taking a long time to get to sleep 17% Worry keeping you awake at night 36% Sleeping badly at night 70% Reported at least one of these problems	53% Waking up in the early hours of the morning 13% Lying awake most of the night 33% Taking a long time to get to sleep 12% Worry keeping you awake at night 24% Sleeping badly at night 75.2% Reported at least one of these problems

Statistics compiled from the following Australian Longitudinal Study on Women's Health Data Books, all retrieved from: <<http://www.alswh.org.au/for-researchers/data/data-books>>

Data Book for the 1989-95 Cohort (2018)

Data Book for the 1973-78 Cohort (2016)

Data Book for the 1946-51 Cohort (2018)

Data Book for the 1921-26 Cohort Surveys 1-6 (2016)

## Young women

- Over nine years of follow up (Survey 1, 1996 – Survey 4, 2006), the prevalence of self-reported sleep difficulties in the 1973-78 cohort remained constant at around 10%<sup>1</sup>.
- Jackson et al (2015) found that women who reported sleep difficulties 'often' in 2000 had a very high risk of continued sleep difficulties over the subsequent 9 years (11.07 times higher in 2003, 12.19 times higher in 2006 and 10.7 times higher in 2009.)<sup>1</sup>
- Just over 45% of the women who reported having sleep difficulties 'often' in 2000 had persistent sleep difficulties. Twenty-one percent experienced a relapse of symptoms. About one-third of women who reported sleep problems 'often' sought help<sup>1</sup>.
- The continued nature of sleep disturbance in young women suggests that current health practices are not enough to break the chronicity of the problem<sup>1</sup>.

## Sleep disruption in pregnancy

- In 2010, Lauche et al. conducted a sub-study with 2445 participants from the Australian Longitudinal Study on Women's Health who had recently given birth. They found that during their pregnancy, 15.2% of women experienced sleeping problems while 35.4% experienced tiredness or fatigue<sup>2</sup>.
- Women most commonly consulted with an obstetrician (n = 96) or a general practitioner (GP) (n = 74) for their tiredness or fatigue rather than a midwife (n = 56). A substantial number of women sought help from a complementary and alternative medicine (CAM) practitioner for sleeping problems (33%) or tiredness/fatigue (28%)<sup>2</sup>.
- Not all women sought help, and given the serious implications of untreated sleep- and fatigue-related symptoms for mother and baby, this area of research deserves and requires more attention<sup>2</sup>.

## Midlife and menopause

- Brown et al. (2002) found that perimenopausal women were more likely to report headaches, back pain, stiff joints, tiredness and difficulty sleeping than other women<sup>3</sup>.
- Berecki et al. (2009) found that post-menopausal women were 8.6 times more likely to experience hot flushes, 5.5 times more likely to experience night sweats, and 1.4 times more likely to report difficulty sleeping than pre-menopausal women<sup>4</sup>.
- Louise et al. (2016) found that women who have a hysterectomy (with ovarian conservation) have a higher risk of hot flushes and night sweats that persist over an extended period<sup>5</sup>
- Chung et al. (2018; analysing pooled data from the InterLACE consortium, including data from ALSWH) found that increased risk of sleeping difficulty during menopause is largely explained by vasomotor symptoms (e.g. hot flushes and night sweats) and depressed mood<sup>6</sup>.

## Older age

- Older women's sleeping difficulties tended to be persistent, with sleeping difficulty at Survey 1 (1996) being a strong predictor of reporting the same problem at

Survey 2 (1999). Sleeping difficulties at Survey 1 were cross-sectionally and prospectively predictive of poorer SF-36 scores, as well as predicting falls, accidents, and higher use of health services<sup>7</sup>.

- Longitudinal analysis by Leigh et al. (2015) identified four patterns of sleep behaviour among the older women as they aged from their early 70s (70-75) to their late 80s (85-90):
  - 23%, troubled sleepers – who tend to take a long time to get to sleep, wake early and sleep badly,
  - 29%, early wakers – who tend to wake early but are less likely to report other sleep difficulties,
  - 17%, trouble falling asleep – who tend to take a long time to get to get to sleep but have low rates of other difficulties
  - 32% untroubled sleepers<sup>8</sup>.

## Predictors of sleeping difficulties

### Young women

- In young women aged 24-30 years, depression and anxiety symptoms were the greatest predictors of difficulty sleeping. Bruck et al. (2012) found that once variables like depression and anxiety were accounted for, four additional factors made significant contributions to sleep difficulties:
  - Binge-drinking
  - Having lower qualifications
  - Dissatisfaction with excessive weight
  - History of abuse<sup>9</sup>.

### Sexual violence and difficulty sleeping

- Health care providers need to make a careful assessment of any history of sexual violence when young women seek help for recurrent sleep problems<sup>10;11;12</sup>.
  - Around 9% of the young women from the 1973-78 cohort reported experiencing forced sex. These women were nearly 50% more likely to report recurrent sleep difficulties<sup>10</sup>.
  - Forced sex remained a significant predictor of recurrent sleep difficulties, even after controlling for previously established risk factors for sleep difficulties like depression and anxiety<sup>10</sup>.
  - Analysis by Astbury et al. (2010; 2010) suggests that the sleep difficulties of survivors of sexual violence may be embedded in complex relationships with depression, anxiety and self-harm, underpinned by socioeconomic disadvantage and potentially exacerbated by illicit drug use<sup>11;12</sup>.

### Work

- Clark et al. (2017) found that among young (31–36 years; 2009) and mid-aged (59–64 years; 2010) sleep durations were lower on work days than non-work days, most notably amongst those who worked shifts or nights, but also among full-time workers, and across all occupational groups<sup>13</sup>

### Chronic conditions

- Leigh et al. (2016) investigated the association between chronic disease and sleep difficulty in women in their seventies from the 1921-26 cohort. They found that arthritis and heart disease were the strongest predictors of sleep difficulty. Bronchitis/emphysema, osteoporosis, asthma, diabetes, and hypertension also predicted greater sleep difficulty<sup>14</sup>.

## Health outcomes

### General

- Among older women, sleeping difficulties were associated with reduced survival, however, this was accounted for by associated disease and disability<sup>15,16,17</sup>.

### The role of disrupted sleep in obesity and nutritional choices

- Bennett et al. (2016; 2017) investigated the relationship between sleeping behaviour and macronutrient intake in childbearing aged women from the study. They identified three groups. Group 1 averaged eight hours of sleep per night with no sleeping problems. Group 2 averaged eight hours per night but experienced sleeping difficulties and severe tiredness. These women had lower intakes of protein and protein-to-carbohydrate ratio. The third group of women averaged less sleep (approx. 6 hours per night) with sleeping difficulties and severe tiredness. These women took in more of their daily kilojoules from fat and saturated fat. Sleeping difficulties were also linked to a heavier body weight, and poorer mental and physical health<sup>18,19</sup>.

### Mental health

- Jackson et al. (2014) found that young women who reported 'often' having sleeping difficulties in the 2000 survey were 2.6 times more likely to have new-onset depression in 2003, 4.4 times more likely by 2006 and 4.4 times more likely 2006. Their odds of having new-onset anxiety increased 2.4 times in 2006, and 2.9 times in 2009<sup>20</sup>.

### Non Communicable Diseases (NCDs)/chronic disease

- Leigh et al. (2015) identified four classes of persistent sleep difficulty amongst women in their seventies: troubled sleepers (22.7%); early wakers (28.8%); trouble falling asleep (16.5%); and untroubled sleepers (32.1%). The risk of having three or more diseases (as opposed to no disease) was 1.9 times higher for troubled sleepers, 1.9 times higher for early wakers and two times higher for those with trouble falling asleep<sup>16</sup>.

## Use of sleeping medications and health services

### In the 1946-51 cohort:

- 7% took medications to sleep S1 (age 45-50)
- 18% took medications to sleep S7 (age 62-67)
- Schofield et al. (2014) examined the prevalence of self-reported use of prescribed medications to treat sleep problems in middle-aged women from the 1946-51 cohort. They found that:

- Depressed women were 1.3 times more likely to use medication to help them sleep than non-depressed women
- The odds of using medication to sleep decreased as women's physical and mental quality of life scores improved
- Women who reported seeing a counsellor, psychologist, or social worker in the previous 12 months were 1.8 times more likely to use medication to help them sleep than those who didn't see a mental health professional
- Women who had surgical menopause were 1.7 times more likely to take sleep medication than pre-menopausal women
- Women using HRT were 1.2 times more likely to take sleep medication than pre-menopausal women
- Women in small rural/remote areas were less likely to take medication to sleep than women in metropolitan areas<sup>21</sup>

In the 1921-26 cohort:

- 18% took medications to sleep S1 (age 70-75)
- 24% took medications to sleep S6 (age 85-90)
- Byles et al. (2003) found the use of sleep medication at baseline was negatively associated with physical functioning, bodily pain, vitality, social functioning and general mental health scores. The use of sleep medication was also significantly associated with falls, accidents, and health care utilisation<sup>22</sup>.
- The researchers found that quality of life scores were significantly lower for women reporting sleeping difficulty and women using sleeping medication. Similarly, increased difficulty sleeping or sleeping medication use was linked to lower mental health scores<sup>22;23</sup>.
- Byles et al. (2005) further found that of women with sleeping problems, 72% sought help from a doctor, and 54% used prescribed sleeping medications in the last month<sup>24</sup>.
- In a substudy by Feldman et al. (2002) 30% of widowed women had taken medication to help them sleep or "for their nerves" within the four weeks prior to survey<sup>25</sup>.

Complementary and Alternative Medicine (CAM)

- An analysis by Meredith et al. (2017) found that women in their 60s who reported a sleeping problem were 1.2 times more likely to be using herbal medicines than women without sleeping problems<sup>26</sup>.
- Among pregnant and recently pregnant women from the 1973-78 cohort, those with sleeping problems and fatigue were both 1.3 times more likely to use herbal medicines<sup>27</sup>.

## Implications

- Sleeping difficulty and fatigue during pregnancy and the perinatal period can have negative impacts on the wellbeing of women and their infants. Greater awareness of the need for sleep and strategies and support for women to get sufficient rest.
- Providers caring for pregnant women and mothers should actively inquire about the use of herbal medicines.
- Sleeping difficulty among younger women may be an indicator or underlying complex psychosocial and health problems include abuse, poor mental health, and risky behaviours.

- Sleep is associated with poor nutrition and being overweight, which are significant public health problems. These links need to be better understood, and to identify opportunities for health promotion. Better diet may improve sleep. Additionally, improved sleep patterns may make it easier for women to optimise their weight status.
- Sleeping difficulty is a common and serious health risk among mid-age and older women and may be amenable to intervention to improve quality of life and reduce poor health outcomes particularly among those with chronic comorbid conditions.
- Health professionals treating older patients with sleeping problems should actively inquire about the use of herbal medicines.

## 5. Current national research and investment into sleep health and sleeping disorders

The Australian Longitudinal Study on Women's Health, also known as Women's Health Australia, is funded by the Australian Government Department of Health and managed by the University of Newcastle and the University of Queensland. It represents a major investment in public health research and provides an evidence base for further research into sleep as a health issue, its impacts and its association with health, health care use and costs. The study tracks the health and wellbeing of over 57,000 women in four cohorts born in 1921-26, 1945-51, 1973-78, and 1989-95. The women are frequently asked questions about sleep.

Since its inception in 1996, a number of Substudies have asked participants additional questions about their sleep quality and habits. In some cases sleep health is the main focus of the substudy or analysis and in others, it is considered in its role as a determinant of women's health and wellbeing and as a consequence of health and lifestyle.

- Longitudinal study of sleeping difficulty and medication use among older women. This substudy of 1210 women from the 1921-26 cohort was conducted in 2000. It has involved a suite of studies looking at health outcomes for women with sleeping difficulties.
- The Mothers and their Children's Health (MatCH) substudy has gathered data on the children of mothers in the 1973-78 cohort. It is funded by the NHMRC to examine the relationships between women's health and wellbeing and their children's health and developmental outcomes.

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A detailed description of the background, aims, themes, methods, and representativeness of the sample and progress of the study is given on the project website. Copies of surveys are also available on the website, along with contact details for the research team, abstracts of all papers published, papers accepted for publication, and conference present