

Research by the Sleep/Wake Centre - Massey University

Sleep of Mothers, Babies and Children

E Moe, Māmā - Maternal Sleep and Health in Aotearoa/New Zealand

Collaborators: Dr Mark Huthwaite, Department of Psychological Medicine, Otago University; Professor Kathy Lee, University of California San Francisco

This project investigated:

- 1) how sleep in late pregnancy might affect a woman's birth experience, and
- 2) the relationship between sleep across the perinatal period and symptoms of depression and anxiety.

The study recruited 766 non-Māori women and 423 Māori women and was guided by key principles from Kaupapa Māori research philosophy. These include Māori participation and control at all stages of the research; appropriate collection of ethnicity data; and statistical methods that seek to allow for possible explanations of any differences in findings between Māori and non-Māori women in the study.

Many of the women in the E Moe, Māmā study have stayed with us and are now a part of the Moe Kura cohort which is following these families as the children grow.

The PIPIS Study ~ Parent Information on Parent and Infant Sleep

Collaborators: Dr Duncan Babbage, School of Psychology, Massey University.

This study trialled a sleep education programme with pregnant, first-time mothers aimed at promoting their sleep (and their infant's sleep) in the first six-weeks after birth. Two groups of 20 women and their babies had their sleep monitored using an "actiwatch" when the babies were 6 and 12 weeks old. The control group attended an antenatal class where they were briefed on the protocol for monitoring their sleep for two 48-hour periods. The intervention group attended an antenatal class which also included education about their own sleep, normal infant sleep development and strategies to help improve their own and their infant's sleep in the early weeks. In addition, intervention group sleep were contacted each week for the first 6 weeks to offer them sleep support. Women in the intervention group felt more confident about managing their own and their baby's sleep and their total sleep at night increased significantly from 6 to 12 weeks postpartum (on average, 46 minutes per night). In contrast, nocturnal sleep for control group women did not increase significantly. The aim now is to make this programme available to all new mothers in Aotearoa/New Zealand.

Moe Kura - Mother and Child, Sleep and Health, Aotearoa/New Zealand

Women who participated in the E Moe, Māmā study, and the child they were pregnant with at the time, were invited to participate in an ongoing programme of research, the Moe Kura project. This focuses on mother and child sleep, exploring the factors that affect it and how sleep impacts mother and child health and wellbeing.

Data has been collected from 295 Māori women and 618 non-Māori women when their E Moe, Māmā child reached 3 years of age. This information is presently being used by Dee Muller and Clare Ladyman as part of their doctoral research.

Dee's project is focused on the social determinants of preschool children's sleep in Aotearoa/New Zealand and will investigate whether the ethnic and socioeconomic disparities evident for adults' sleep in Aotearoa/New Zealand also exist for young children. Dee is a Massey University Doctoral Scholar and recipient of a new New Zealand Massey Foundation grant. Her thesis is planned for completion in 2018.

Clare's doctoral research is looking at maternal sleep and mental health data from the E Moe Mama and Moe Kura studies to determine if women experiencing depressive symptoms or sleep disruptions in pregnancy are more or less likely to experience persistent poor sleep or persistent depressive symptoms three years post birth. It also includes the Sleep HAPi project which is examining if a sleep education program in pregnancy has an effect on depressive symptoms in women who have a prior history of depression.

Women having their first baby, who are less than 13 weeks pregnant, and who have a prior history of depression are currently being recruited.

Sleep of Infants

Collaborator: Professor Dawn Elder, Department of Paediatrics and Child Health, University of Otago.

This project investigated the prevalence of parental-reported sleep problems amongst 52 healthy one-year olds. Objective and subjective sleep data, as well as demographic, health, and developmental factors to examine factors associated with reporting a sleep problem and to investigate physical and developmental outcomes of sleep problems in infancy.

A third (35%) of infants were considered by their parents to have a sleep problem. They had poorer sleep confirmed by actigraphic monitoring, were more likely to still be breastfed, and had poorer rated bedtime mood compared to "good sleepers". Measures of sleep duration and efficiency were significantly related to stages of motor and cognitive development as well as age.

Teenage Sleep

A number of major changes in sleep occur across puberty, including progressively later bedtimes and becoming more evening-type. This often results in truncated sleep on school mornings and later, longer sleep on weekends. Evening use of technologies with blue-rich screens can further delay sleep. In international studies, sleep loss in teens is associated with lower academic performance, lower self-esteem and higher incidence of depressive symptoms, increased substance use, being overweight, and increased risk of physical injury and road traffic crashes. However, the problems associated with adolescent sleepiness tend to go unrecognised because they are so common that they are considered normal.

Two surveys with Wellington High School students (years 9 and 12) in 1999 and 2008 highlighted changes in sleep timing across puberty, confirmed the value for the senior school of delaying school start time by 1.5 hours (making the first period of the day a study period), and revealed the increasing impact of technologies in the bedroom, particularly among students in the junior school whose 9 am start time had not changed.

A new study lead by Dr Lora Wu is comparing the timing of the evening melatonin rise (a marker of the circadian body clock cycle) in students from different schools whose first class starts before 9 am versus after 10 am.

Sleep of Adults

This portfolio of research aims to increase understanding of the sleep habits and sleep health of New Zealand adults, aiming to inform more effective public health approaches and appropriate sleep diagnostic and treatment services. Central to this work are our collaborations with Te Rōpū Rangahau Hauora a Eru Pōmare and the WellSleep Clinic at Otago University Wellington. Follow-up work is in progress analysing the 2013-2014 National Health Survey data, in collaboration with the Ministry of Health (Dr John McCarthy).

1. Sleep Duration

The recommended sleep duration for adults aged 26-64 y to maintain health, safety, productivity and well-being is 7-9 h. Among New Zealanders aged 20-59 y, Māori are more likely than Non-Māori to report usual sleep duration longer or shorter than recommended. Higher rates of unemployment, night work, and socioeconomic deprivation among Māori contribute to these differences. Growing evidence suggests that poor sleep may mediate ethnic inequities in other areas of health.

Social jetlag describes the discrepancy in the amount and timing of sleep on scheduled days versus free days. Getting at least 2 hours more sleep on free days indicates that a person is getting insufficient sleep on scheduled days. Among NZ adults aged 20-59 y, 30% of Māori and 23% of non-Māori have insufficient sleep. The difference by ethnicity is partly explained by greater socioeconomic deprivation and more night work among Māori.

2. Sleep Timing

In contrast to other aspects of sleep, significant differences have not been found in measures of sleep timing between Māori non-Māori, for example in Horne-Ostberg Morningness/Eveningness scores, or in the estimated population prevalence of advanced and delayed sleep phase syndromes.

Sleep Disorders

The following table summarises prevalence estimates for obstructive sleep apnoea syndrome and insomnia among New Zealand adults, based on our national surveys.

	Age range (y)	Māori		non-Māori	
Chronic sleep problem (≥6 months)	20-59	29%		25%	
Obstructive sleep apnoea syndrome ^a	30-59	Men	Women	Men	Women
		4.4%	2.0%	4.1%	0.7%
Insomnia Symptoms ^b	20-59 y				
Difficulty falling asleep often/always		36.5%		28.7%	
At least 3 nocturnal awakenings		28.4%		20.8%	
Difficulty getting back to sleep often/always		53.0%		48.6%	
Wake too early in the morning often/always		48.8%		38.0%	
Wake refreshed never/rarely		59.1%		53.8%	

a. Obstructive Sleep Apnoea Syndrome (OSAS)

OSAS was defined as having a respiratory disturbance index ≥ 5 and ESS > 10 . These are conservative prevalence estimates based on data collected in 1991-2001 and prevalence will have increased with increasing obesity rates. In the 2013-2014 National Health Survey (13,309 adults aged 18+ y), only 1.9% of participants had been diagnosed with obstructive sleep apnoea (John McCarthy, personal communication).

An economic analysis based on these data and treatment services in Wellington in 2005 estimated that the total annual societal costs of OSAS for New Zealanders aged 30–59 y were \$40 million (\$419 per case), with accidents being the major contributor. The incremental net direct medical cost per quality of life year (QALY) gained with successful treatment was \$94. (This is the difference between the cost of treating and the cost of not treating). By comparison, the average cost for new drugs funded by PHARMAC in 2004/05 was \$6,865 per QALY gained. These analyses strongly support the cost effectiveness of treating OSAS.

b. Insomnia

Based the 2001 insomnia survey, it was estimated that 13% of New Zealanders aged 20-59 y (2.317 million people in 2008) had insomnia. In the survey, Māori were more likely than non-Māori to report the common insomnia and to experience excessive daytime sleepiness. An economic analysis based on these data estimated the total annual societal costs of insomnia for New Zealanders aged 20–59 y were \$28.4 million (\$628 per case) and that successful insomnia treatment would save \$21.8 million per year. The incremental net saving per quality of life year (QALY) gained with successful treatment was \$3,9072. (This is the difference between the cost of treating and the cost of not treating). These analyses indicate that effective insomnia treatment would save money as well as improving the health, safety, and quality of life of many New Zealanders.

However, there is not yet a systematic diagnostic pathway or funding for treatment of insomnia in the public healthcare sector. In the 2013-2014 National Health Survey (13,309 adults aged 18+ y), only 3.4 % of participants had been diagnosed with insomnia (John McCarthy, personal communication).

Sleep in Aging and Dementia

Life expectancy is increasing, and with it the prevalence of sleep problems that can have a negative impact on waking function and comorbid disease, as well as increased healthcare usage and mortality. This research programme focuses on improving the sleep of older people, including those with dementia and their family carers, and is led by Dr Rosemary Gibson. Key collaborators include Professor Tony Dowell (Otago University Wellington), Dr Linda Jones (Massey University, School of Psychology), Alzheimers New Zealand and Alzheimers Wellington, the Health Work and Retirement project (Massey University) and the Life and Living in Advanced Age (LiLACS NZ, Auckland University).

The research, which has a person-centred approach, is providing the first NZ-based data illustrating the importance and diverse nature of sleep problems with ageing, dementia, and caregiving. A trial has demonstrated that non-pharmacological interventions can be effective for some couples where one partner has dementia, and has provided useful insights for a planned primary care-based intervention. Work in progress includes a nationwide postal survey via the 21 regional offices of Alzheimers NZ clients focusing on the sleep of people with dementia and their family carers and analyses of the fifth wave of the LiLACS NZ Survey to examine sleep changes over time.

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