

*The Australian Work and Life Index 2010*



# FILANVMS

in our  
Lives

**Fatigue Life and Work Strain**

**Natalie Skinner,  
Someyah Parvazian  
AND Jill Dorrian**



**Government of South Australia**  
SafeWork SA



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## Executive Summary

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Sleep problems and fatigue are widely recognised as important issues not only for health and wellbeing, but also for safety and productivity in the workplace.

There is a substantial body of research in Australia and internationally on the causes and consequences of fatigue in the workplace. Much of this research focuses on specific occupations and industries in which the nature of the work and its scheduling clearly place workers at risk, for example, the mining, health and transport industries (see Australian Safety and Compensation Council, 2006 for a review of Australian research).

This report has a wider focus than most previous research as it examines sleep issues and fatigue across all industries in the general South Australian (SA) working population.

We also bring a new perspective to sleep issues and fatigue, by applying a work-life lens to extend the consideration of risk factors outside the domain of the workplace. In this study we consider how configurations of gender, caring responsibilities (parenting), and work arrangements affect sleep and fatigue.

We created the term the ‘FLAWS’, to capture this work-life perspective on the intersection of work and life circumstances that pressure and strain workers’ capacity to function effectively and maintain their wellbeing.

- *F*atigue
- *L*ife
- *A*nd
- *W*ork
- *S*train

There has been little cross-over in research on work-life interference and sleep issues and fatigue. It can be argued, that all three are broadly indicative of the quality of working life, personal life and wellbeing. Problems in any of these three areas can also be indicative that paid work is reaching too far into personal, family and social life, and impairing the individual’s capacity to function effectively.

There is also significant overlap in the work factors that increase the risk of problems with sleep, fatigue or work-life interference: shift work, non-standard hours, long hours and intensive work.

In this study we consider all three of these indicators together, to help identify unhealthy work arrangements that indicate possible impairments to functioning and wellbeing.

We also extend our understanding of these issues by examining how sleep, fatigue and work-life interference are related. Caring responsibilities, for example, can create a “double burden” of work and family responsibilities that is likely to increase the risk of fatigue from long hours or intensive paid work. Yet we know very little about how work, personal and family life factors combine to increase or decrease fatigue and sleep issues. This study addresses this gap, and is designed to contribute towards development of more effective policies and practices to reduce the impact of paid work on fatigue and sleep.

From an occupational health and safety perspective, the primary aim of this project is to identify strategies to improve the quality of working life, support mental health and wellbeing inside and outside the workplace, and to prevent workplace injuries.

This project was designed to provide high quality evidence to inform and evaluate the recommendations of the SafeWork SA Code of Practice on Working Hours (SafeWork SA,

2010). The Code identifies a range of practices related to the length and scheduling of work hours that are likely to increase the risk of negative outcomes such as injury and illness, many of which are related to fatigue and sleep issues. In this report we focus particularly on the length and scheduling of work hours.

## **Project background**

This report is part of a larger research project 'Developing an Australian evidence-base for policies and interventions on work hours, fatigue and work-family strain', funded through the SafeWork SA 2009 Commissioned Research Grants Programme. The project is being conducted as a collaboration between the University of South Australia's Centre for Work + Life and Centre for Sleep Research.

Taking a work-life perspective, we examine how two factors, gender and parenting status, interact with work arrangements to influence the likelihood of sleep issues and fatigue.

This report uses data collected from the 2010 Australian Work and Life Index (AWALI) data collection in South Australia. Detailed findings on work hours and work-life interference can be found in the report 'Juggling work-life balance in South Australia' (Skinner & Pisaniello, 2010), available from the Centre for Work + Life website

<http://www.unisa.edu.au/hawkeinstitute/cwl/projects/awali.asp>. The South Australian survey sample comprises 969 employed workers (854 employees and 115 self-employed). This representative sample is a randomly selected cross-section of the adult South Australian employed population, with data collected by computer-assisted telephone interviews (CATT).

## **Main findings**

*Substantial proportions of SA employees have sleep issues or fatigue*

Fatigue is commonplace in the general working population; 30.4 per cent of employees frequently feel fatigued (extremely tired or completely exhausted).

Regularly having seven or more hours of sleep is recommended for good health (Banks & Dinges, 2007). Overall, 28.5 per cent of employees report they never or rarely reach this benchmark.

When asked directly how often work causes them to have less sleep than they need, 15.4 per cent of employees report this occurs frequently (often/almost always), and a further 23.7 per cent report work 'sometimes' restricts their sleep.

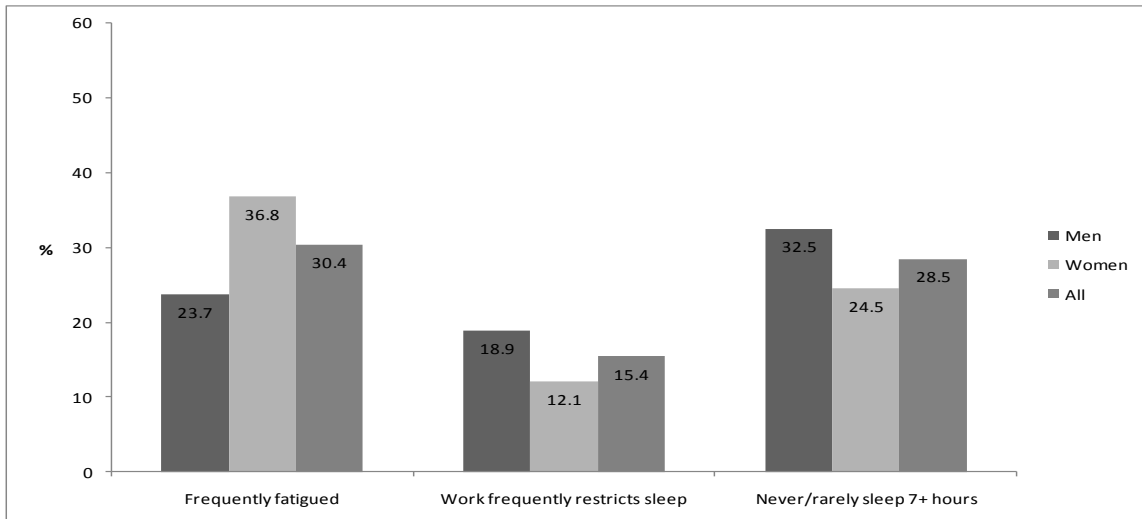
*Men are more likely to report sleep issues, women are more likely to be fatigued*

In considering gender differences it is important to put these in the context of the average working patterns of men and women. Men are more likely to be working full-time (rather than part-time), longer full-time hours (45+) and non-standard schedules (outside 8 am to 6 pm).

These gender differences in the length and scheduling of work may account for the finding that, overall, men are more likely to report that:

- Work restricts their sleep (18.9 per cent; 12.1 per cent of women);
- They rarely/never have sufficient sleep (7+ hours) (32.5 per cent; 24.5 per cent of women).

Fathers are particularly affected: 40.2 per cent report never or rarely having more than seven hours sleep.



As discussed in Section 1 (Introduction) there is extensive laboratory and field research demonstrating the negative effects of sleep loss and disruption for physical health, cognitive functioning and psychological wellbeing.

In this study of the general working population we find that substantial proportions - nearly one-third of working men and one quarter of women – are at risk of experiencing at least some of these negative outcomes due to insufficient sleep. This in turn, is likely to be place significant strain on their capacity to be effective and engaged workers, parents, partners, friends and community members.

Whilst women are less likely to report sleep issues, they are significantly more likely to experience frequent fatigue (36.8 per cent; 23.7 per cent of men).

The finding that nearly 40 per cent of working women feel extremely tired or completely exhausted on a regular basis (often/almost always) is significant. There is clear evidence that fatigue increases the risk of workplace accidents, transport accidents and serious decrements to work performance (see the Introduction section for a review of this research).

Workers are very aware of the negative effects of their fatigue on their work. As described below, in this study workers also report that fatigue harms their health and functioning at home and in their community.

*Men’s fatigue is more strongly associated with work factors, women’s fatigue is likely related to other (non-work) factors*

The higher prevalence of fatigue for women is ubiquitous: this gender difference occurs regardless of parenting status, it is evident for all workers on standard schedules (within 8 am to 6 pm), and across all full-time workers.

There is one exception: on non-standard schedules an equivalent proportion of men and women report frequent fatigue.

We also observe men’s fatigue increases with longer (daily and weekly) work hours, whereas women’s fatigue is not strongly associated with their work hours (except for women with children as discussed below).

This suggests that men’s fatigue is influenced more by their work arrangements (hours, scheduling), whereas other factors are influencing women’s fatigue.

These other non-work factors are likely to relate to gender inequities in unpaid care and domestic work men (Craig, 2007; Grimshaw & Murphy, 2005; Pocock, 2005). Even when

working part-time, and hence spending less time in paid work, we know from qualitative and quantitative research that many women have very busy lives and are as time pressured as men working full-time (Higgins, Duxbury, & Johnson, 2000; Pocock, Skinner, & Pisaniello, 2010; Walsh, 2007). Indeed, many women working part-time find that they have substantial challenges in managing multiple commitments, as they are seen as a resource for school, home, family and community activities (Williams, Pocock, & Bridge, 2009). All of these factors are likely to contribute to the high prevalence of fatigue for working women.

*Fatigue is particularly high for mothers working full-time*

Overall, there is little difference in the likelihood of fatigue between part-timers and full-timers, or between those working standard or long (45+) full-time hours.

There is a significant gender difference – work hours are associated with increased fatigue for women with children.

Nearly half (47.5 per cent) of mothers in full-time work report frequent fatigue compared to around a quarter (25.3 per cent) of fathers working full-time and around one-third (34.7 per cent) of mothers working part-time.

The factors that create pressures for working women are well documented: lack of quality childcare, inflexible work hours, and inequality in time spent on childcare and domestic work at home (Australian Bureau of Statistics, 2009; Craig, 2007; Craig & Mullan, 2009; Pocock, 2003). These factors are also likely to contribute to women's, particularly mothers', higher rates of fatigue.

*Women have higher work-life interference in most employment arrangements*

When we consider all men and women employees, there is little difference in work-life interference. This broad contrast hides important and significant differences between men and women in specific work arrangements.

In part-time and long full-time (45+ hours) work, women have worse work-life interference than men, whether they work standard or non-standard schedules.

Women also report higher work-life interference than men when working 35 to 44 hours on a standard schedule (between 8 am and 6 pm).

Interestingly, this gender difference is reversed for those working non-standard schedules (outside 8 am to 6 pm) for 35 to 44 hours: men have worse work-life interference than women. This may reflect the higher proportion of men engaged in night work – the worst schedule for both work-life interference and sleep issues/fatigue. Or, this finding may be an artefact of the low sample size for women in this group, and therefore should be interpreted with caution.

*Different pathways, same destination: men and women have equivalent risk of FLAWS'*

In this study we created a combined measure of work-related pressure and strain reflected by the simultaneous experience of high work-life interference *and* frequent sleep issues or fatigue.

The combination of high levels of strain in these two areas (work-life and sleep/fatigue) represents the highest level of the **F**atigue, **L**ife **A**nd **W**ork **S**train (FLAWS).

Just under 30 per cent (29.0 per cent) of workers report the highest levels of FLAWS, with little difference between men and women.

This is an important observation, as men are more likely to be in employment arrangements that increase the risk of work-life interference and sleep issues (i.e. longer hours, non-standard schedules). Despite this, the risk of high FLAWS is equivalent for men and women.

This most likely reflects gender inequities in the time spent in non-paid caring and domestic work. Despite these different likely sources of work-life pressure, the ultimate prevalence of high FLAWS for men and women is the same.

*Workers at their peak years of family formation and work (aged 30 to 44) are most at risk of sleep issues, fatigue and work-life interference*

Work and household arrangements, particularly around family formation and composition, differ across life stages. The meaning and role of work also changes, from initial career choice and development, to career/work consolidation, and eventually the start of transition to retirement.

Comparing sleep issues and fatigue across three age groups of workers at the beginning (aged 20 to 29 years), middle (aged 30 to 44 years) and later (aged 45 to 64 years) stages of their engagement in paid work, one group in particular stands out as at high risk: men aged 30 to 44 years.

Men aged 30 to 44 years are the group most likely to have work-life configurations that increase the risk of a poor work-life relationship, specifically long hours (combined with parenting) and working non-standard schedules. Older men are not far behind on the prevalence of sleep issues, but fatigue is not as common for these older men compared to their counterparts aged 30 to 44 years.

A slightly different pattern is evident for work-life interference.

Workers aged from 20 to 44 report the highest work-life interference. This most likely reflects the convergence of both intensive family/parenting commitments associated with starting a family or having young children, combined with a time of peak work/career engagement.

Even though men aged 20 to 44 years work longer hours and are more likely to work non-standard schedules compared to women in this age group, they report equivalent levels of work-life interference. Furthermore, when we statistically control for differences in the length of work hours, women aged 20 to 44 have the worse work-life interference.

This finding is consistent with patterns observed in the national AWALI survey (Pocock, et al., 2010). It reflects well established observations in Australia and internationally that, when working the same hours, women are more at risk of work-life strains and pressures than men.

*Prevalence of sleep issues and fatigue differ little by employment characteristics (occupation, employment contract)*

There is very little difference in the frequency of sleep issues or fatigue by type of employment contract, occupation or type of employment. Differences that are observed between these work arrangements are due more to underlying patterns of work hours and scheduling, rather than the employment arrangement per se.

*Long hours (45+) increase the risk of sleep issues, fatigue and work-life interference*

Long hours in full-time work are widely recognised as a significant risk factor for illness and injury (Caruso, 2006). In this report long full-time hours are defined as 45+ hours, consistent with the research literature and the SafeWork SA Code of Practice on Working Hours.

Long hours consistently increased the risk of negative outcomes in terms of:

- Work-related sleep restrictions (having less sleep than needed);
- Having insufficient sleep (less than seven hours);
- High work-life interference;
- High FLAWS (high work-life interference *and* frequent sleep issues or fatigue).

It is interesting that fatigue was the only measure that did not vary with work hours. Instead, fatigue is much more strongly related to gender, with women consistently more likely to experience frequent fatigue than men.

*Long days also increase the risk of sleep issues and fatigue*

The SafeWork SA Code of Practice on Working Hours identifies an increased risk of fatigue and other negative outcomes with a work day of longer than nine hours and a work week of longer than 40 hours.

These benchmarks are consistent with the average daily and weekly work hours reported by full-time workers who report frequent sleep issues or fatigue:

Overall, the average full-time work day is 8.8 hours (44.7 weekly hours). Those who report frequent sleep issues or fatigue report longer daily and weekly full-time hours.

- Full-time workers reporting that work frequently restricts their sleep work, on average, 9.6 daily and 49.1 weekly hours.
- For those who never or rarely have sufficient sleep (7+ hours), the average full-time work day is 8.9 hours (45.9 weekly hours)
- Workers who report frequently fatigued work 8.9 hours a day, and 45.1 full-time hours a week.

*Non-standard work schedules, especially night work, are a major risk factor for fatigue, sleep issues and work-life interference*

The other most consistent predictor of sleep issues, fatigue and work-life interference is working non-standard work schedules (outside 8 am to 6 pm).

Workers on non-standard schedules are also more likely to experience high FLAWS (combination of high work-life interference *and* frequent fatigue/sleep issues).

Night work in particular is associated with an increased likelihood of insufficient sleep and work-related sleep restrictions. Furthermore, just over half of these workers (52.5 per cent) report problems with both work-life interference and sleep issues/fatigue (high FLAWS).

*Parents are more likely to have high FLAWS, and to be more negatively affected when working in 'riskier' work arrangements*

Overall, there is little difference in the prevalence of work-related sleep-restrictions or fatigue between those with or without children (aged under 18 years old).

Parents are more likely to report insufficient sleep and higher work-life interference. This is not surprising. Parents of young children often experience sleep disruption. It is also well established that parenting increases the likelihood of experiencing work-life strains, as parents need to manage multiple responsibilities in busy households as well as meeting the demands of paid work.

Fatigue is not affected by parenting status. Rather, gender trumps parenting: women are more likely to be fatigued than men, regardless of whether they have children or not.

Whilst they may not be at more risk of fatigue per se, parents are more likely to have high FLAWS – high work-life interference combined with frequent fatigue/sleep issues.

The other effect of parenting responsibilities is to increase the impact of 'riskier' work arrangements (long hours, non-standard schedules, night work). These arrangements have a stronger effect on sleep issues, fatigue and work-life interference for those with parenting responsibilities compared to those without children (under 18 years old).

*Long work hours and work-related worries are common causes of work-related sleep restrictions*

Workers who reported that work sometimes, often or almost always causes them to have less sleep than they need (39.1 per cent) were asked to identify the specific aspects of work that cause these sleep restrictions (multiple factors could be identified).

- Around half of workers (49.3 per cent) identify long hours as a restricting their sleep, whether on standard or non-standard schedules;
- Just over forty per cent (42.4) identify working overtime as impacting negatively on their sleep;
- Reflecting their longer average work hours, men are more likely to identify long hours as a cause of sleep restrictions (56.4 per cent; 40.9 per cent of women);
- Women are more likely to attribute sleep problems to work-related worries or tension.

These gender differences are interesting. That men are more likely identify long hours as a problem for their sleep is not surprising, since they work longer hours on average, and are more likely to work very long hours (45+).

Work worries or tension are clearly significant for women; three quarters of women working on standard schedules (within 8 am to 6 pm) attribute their sleep restriction to this cause (42.8 per cent of men). This may reflect an industry/occupation difference; women are more likely to be employed in caring and service work involving substantial comments of “emotional labour” that may spill over into life outside work (e.g. worrying about clients, students or others to whom they provide a service). It is also possible that gender differences in the propensity to report the experience of emotion per se, may also extend to the reporting of work worries as impacting on sleep (Gross & John, 1995; Kring & Gordon, 1998).

Parenting responsibilities make little difference to the attributed causes of sleep restrictions.

Work related tensions or worries are most likely to affect sleep for those on standard schedules (within 8 am to 6 pm) (61.8 per cent) compared to workers on non-standard schedules (44.8 per cent).

As expected, the majority of workers on non-standard schedules also identify factors related to the arrangement of work, such as early mornings (60.2 per cent) and changing shifts (47.8 per cent), as causes of their sleep restrictions.

*Fatigue has wide-ranging consequences at work, at home, in the community and for workers' health*

Workers who identified sometimes, often or almost always, feeling fatigued (extremely tired or completely exhausted) (72.7 per cent) were asked to identify the consequences for their work and non-work activities.

The majority of workers experience effects of their fatigue in a range of non-work domains such as mood at home, physical health, family and personal life/interests.

Respondents also reported their fatigue negatively affected a range of work outcomes:

- 46.5 per cent report negative impacts on their productivity
- 40.0 per cent report their quality of work is affected;
- 27.4 per cent report their work commutes are less safe because of their fatigue;
- 18.0 per cent report reduced safety whilst at work.

Safety is a particular issue for workers on non-standard schedules.

- Nearly one quarter (23.5 per cent) of workers on non-standard schedules are concerned about the impact of their fatigue on safety at work (15.0 per cent of those on standard schedules);
- Safety travelling to and from work is a concern for around 30 per cent of men and women working non-standard schedules, and a similar proportion of men working standard schedules.
- There are also occupational differences; managers and professionals are more likely to perceive negative effects of fatigue on their work quality, productivity and satisfaction.

*Parents' home life is more negatively affected by fatigue, but they 'quarantine' work from negative effects*

Parents are more likely to identify negative effects of fatigue on their personal, home and family life. Seventy per cent of parents report fatigue affects their family life (48.0 per cent of those without children under 18 years), and 73.4 per cent of parents report negative effects on their mood at home (60.5 per cent of those without children). Parents are also more likely to report that their personal hobbies and interests are affected by their fatigue.

Clearly, work-related fatigue is impacting on important aspects of life outside work for the majority of those parents who report feeling fatigued. The experience of mothers and fathers is similar; there are no significant gender differences in these patterns.

On the other hand, parents do not differ from other workers without children on the perceived effect of fatigue on their work (productivity, quality, safety).

This suggests that parents may be 'quarantining' work from the negative effects of their fatigue. Instead, their family and personal life bears the brunt of this impact. Hence the strains of the "double-shift" of paid work and parenting responsibilities exert the greatest impact on their family and home life.

*There is a clear link between work-life interference and the prevalence of both sleep issues and fatigue*

These three wellbeing outcomes are directly associated: as the frequency of fatigue and sleep issues rises, work-life interference also worsens.

This relationship is likely to be reciprocal: more work-life strains may contribute to increase frequency of insufficient sleep, which in turn may make managing work and family/life commitments more challenging (Demerouti, Bakker, & Bulters, 2004).

### **Policy implications**

The findings of this study provide clear support for the recommendations on the length of work hours in the SafeWork SA Code of Practice on Working Hours. Also consistent with the Code, and Australian and international research, this study finds that non-standard work schedules and night work in particular, increase the risk of negative outcomes related to sleep, fatigue and work-life interference.

The workers themselves concur; long hours and overtime are the most common work factors identified as causes of restricted sleep.

Workers are also aware of the effects of their fatigue on their wellbeing, family and personal life and important aspects of their working lives such as safety and productivity.

A consistent theme in this report is the increased risk of strain from combining parenting with particular paid work arrangements. Specifically, the negative impact of long work hours and non-standard scheduling on fatigue, sleep and work-life interference is greatest for parents. Furthermore, the relationship between sleep issues and work-life interference is strongest for parents.

The need for parents to have work arrangements that support their capacity to both engage in paid work and effectively manage family commitments and responsibilities has been recognised in the *Fair Work Act 2009*. The *Act* provides new National Employment Standards (NES) which contain provisions for requests to change arrangements related to work hours (e.g. reducing hours), patterns of work (e.g. shift schedules) and the location of work. These entitlements are available to employees who are a parent or carer of a child who is less than school aged or a child under 18 with a disability.

The findings of this study support the importance of the *Fair Work Act* provision for flexible work arrangements for the wellbeing of parents of young children or children with a disability.

However, the negative impact of long hours or non-standard schedules is not limited just to those with parenting responsibilities – all workers are potentially at risk from hazardous work arrangements regardless of their personal circumstances.

**Recommendation 1:** Broaden the rights to request flexible work arrangements in the National Employment Standards to include all workers, regardless of their parenting status. This would be a significant initiative to improve the quality of Australians’ working lives, reduce work-related risks to safety, health and wellbeing and increase productivity (cf. Pocock, Skinner, & Ichii, 2009).

There is strong evidence that flexible work practices have a range of benefits, including improvements to motivation, productivity, absenteeism and turnover. There are also benefits for worker wellbeing (work-life balance, stress, health) (Eaton, 2003; Grzywacz et al, 2008; Richman et al, 2008; Theoroll, 2002).

Flexibility can be offered and supported in a variety of ways such as:

- reduced hours
- compressed working weeks
- working from home
- flexitime
- variable start and finishing times
- extended leave options

If the daily working arrangements are difficult to change, consider flexible and overlapping blocks of work with different arrangements.

**Recommendation 2:** Develop policies & support cultures for flexible work practices that meet business and workers’ needs.

The NES also establish 38 hours as the maximum weekly hours, with the exception of ‘reasonable’ requests to work longer hours. Criteria for judging the ‘reasonableness’ of requests include risks to health and safety, employee personal circumstances (including family responsibilities) and the needs of the workplace/enterprise.

Whilst it is acknowledged that the ‘reasonable requests’ provision is designed to account for the reality of fluctuations in demand or unusual circumstances that require longer hours to manage, it also significantly weakens the strength of the limit set on maximum hours. In many circumstances it would not be difficult to identify workplace/enterprise needs for employees to work longer hours. Our findings suggest, consistent with the SafeWork SA Code of Practice on Working Hours, working 45+ hours significantly increases the risk of negative outcomes for fatigue, sleep and work-life interference. These outcomes, in turn, are associated with reduced productivity, community and workplace safety. Therefore, it is recommended that an upper-limit be set for ‘reasonable’ hours longer than 38 weekly hours, even taking into account operational needs of the workplace/enterprise.

Initiatives to address long hours require a holistic approach that examines the factors that encourage or require long hours such as workloads, performance expectations, implicit and explicit rewards for long hours (i.e links to promotion and other rewards) and organisational culture (see below).

**Recommendation 2:** Modify the maximum work hours provision in the National Employment Standards to include an upper limit to ‘reasonable’ longer hours of no more than 45 weekly hours (including overtime).

Men are particularly at risk of experiencing a negative impact of work hours and scheduling on their sleep. They are most likely to work long hours, and to work non-standard schedules including night work. Men are also most likely to have their requests for changing their work arrangement rejected (Pocock, et al., 2009). Furthermore, men are most likely to be working

longer hours than they prefer, and to be working the greatest number of ‘involuntary’ hours beyond their preference. This is particularly the case for men with parenting responsibilities, and these patterns can be observed both nationally and in South Australia (Pocock, et al., 2010; Skinner & Pisaniello, 2010).

**Recommendation 3:** Increase policies, programs and initiatives to support the capacity of men and those working in male-dominated occupations and industries to change their work hours and arrangements to suit their needs and preferences. Examples include:

- Providing ‘partner specific’ forms of leave;
- Further supporting and encouraging partners’ right to request flexible work arrangement to meet parenting and other caring responsibilities, including reducing hours of work.

Women are more likely to experience frequent fatigue and work-life interference, even though their (average) work hours are shorter than men’s, and they are less likely to work non-standard schedules. This indicates that women are particularly at risk of negative effects of work on their life outside work.

**Recommendation 4:** More supports and resources are needed to enable women to engage in paid work without experiencing negative health outcome such as frequent fatigue. These include:

- Access to flexible work arrangements that extends to all women (and men), regardless of their parenting status;
- Better access to high quality affordable childcare;
- Initiatives to encourage and support men’s capacity to participate equally in family and household life, to increase gender equity in unpaid work (see Recommendation 3).

Public promotion and management support for policies and procedures are necessary but not sufficient to ensure safe work practices. Workplace culture is crucial. Cultures that support safe shift scheduling practices, flexibility and reasonable work hours can be supported in a range of ways including training and support for managers and supervisors, and inclusion of wellbeing and work-life balance outcomes in staff reviews (e.g check working hours in employee performance reviews, establish KPIs for supervisors/managers).

**Recommendation 5:** Develop and support workplace cultures of safe work practices, including reasonable expectations of workload and working hours.

Non-standard schedules, and night shift in particular, are clearly associated with an increased risk of fatigue, sleep issues and work-life interference. The SafeWork SA Code of Practice on Working Hours (SafeWork SA 2010) identifies a range of policies and strategies to minimize the risk of adverse outcomes from non-standard work schedules. Briefly, these include:

- Developing organisational policies around maximum work hours on a daily, weekly and three-monthly basis;
- Evaluate and review work hours and scheduling arrangements to reduce risk of injury and harm in consultation with employees and health and safety representatives;
- Designing work hours and scheduling to enable sufficient breaks between work days or shifts for rest, recovery and other non-work activities and functions;
- Providing and supporting flexible work arrangements, including reduced hours;
- Design and manage shift work and rosters that, where possible, use forward shift rotations, and avoid early starts, split shifts and sudden changes in scheduling;

- Manage night work hours and scheduling to, where possible, keep sequential shifts to a minimum, ensure adequate breaks between sequences of night shifts, ensuring regular night workers have periods of normal night sleep, and ensuring shifts do not finish after 10am to avoid restrictions in daytime sleep.

The SafeWork SA Code of Practice on Working Hours (SafeWork SA 2010) provides further detailed information on the risk management process for managing work hours and scheduling, working hours control measures, and information on the impact of fatigue on health, safety and productivity.

## Section 1 Introduction

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This report is part of a larger research project ‘Developing an Australian evidence-base for policies and interventions on work hours, fatigue and work-family strain’, funded through the SafeWork SA 2009 Commissioned Research Grants Programme. The project is a collaboration between the University of South Australia’s Centre for Work + Life and Centre for Sleep Research.

From an occupational health and safety perspective, the primary aim of this project is to identify strategies to improve the quality of working life, support mental health and wellbeing inside and outside the workplace, and to prevent workplace injuries.

This study brings together three aspects of work-related wellbeing that have mostly been studied in isolation from one another: sleep, fatigue and work-life interference.

We created the term the ‘FLAWS’, to capture this work-life perspective on the intersection of work and life circumstances that pressure and strain workers’ capacity to function effectively and maintain their wellbeing.

- *F*atigue
- *L*ife
- *A*nd
- *W*ork
- *S*train

Work-life interference, sleep and fatigue can all be considered as outcomes broadly indicative of the quality of working life, personal life and wellbeing. All three can be indicators that paid work is reaching too far into personal, family and social life. They can also be considered to be indicators that healthy and effective functioning is compromised. Sleep loss or disruption is a fundamental physiological hazard that can affect many aspects of cognitive, emotional and behavioural functioning at work, whilst commuting and in one’s personal life. Similarly, fatigue (extreme tiredness or exhaustion) is a significant risk factor that compromises workplace safety, productivity and general health and wellbeing. Work-life interference is a broader indicator of functioning, that addresses the extent to which paid work time and strains intrude into other areas of life (family, personal, social, community) and hence impair the capacity to function effectively across life domains.

As well as being indicators of healthy functioning, sleep, fatigue and work-life interference also share many similarities in the types of work arrangements (shift work, non-standard hours, long hours) that increase the risk of negative outcomes (i.e. lack of sleep, fatigue, high work-life interference).

Yet despite these similarities, very little research considers all three issues together, as symptoms of unhealthy work arrangements that indicate possible impairments to functioning and wellbeing. Nor do we have much knowledge of how sleep, fatigue and work-life interference are related.

The purpose of this study is to examine the work-life configurations that are associated with sleep issues and fatigue.

The study also examines the incidence of sleep issues and fatigue in the general working (employee) population.

We apply a work-life lens by examining how the length and scheduling of work hours affects sleep and fatigue for men and women, and whether these effects differ depending on caring responsibilities. In this study we focused on parenting responsibilities.

As discussed in more detail below, there is strong research evidence of the impact of work hours (duration and scheduling) and the psychosocial work environment (e.g. work intensity, demands, control, job security) on sleep issues and fatigue. However, the larger context of workers' lives, including their personal and family circumstances is often overlooked in research and policy. This is an important gap in current knowledge that the current study is designed to address.

In this study we also examine how work-life interference, sleep issues and fatigue are inter-related, and identify the social and employment demographics of those at highest risk of work-related strain as defined by high work-life interference and frequent sleep issues and/or fatigue (FLAWS).

One of the aims of this project is to provide high quality evidence to inform and evaluate the recommendations of the SafeWork SA Code of Practice on Working Hours (SafeWork SA, 2010). The Code identifies a range of practices related to the length and scheduling of work hours that are likely to increase the risk of negative outcomes such as injury and illness, many of which are related to fatigue and sleep issues. In this report we focus particularly on the length and scheduling of work hours.

### **Understanding the impact of work on wellbeing – the value of a work-life perspective**

Gender, work hours and caring responsibilities (parenting) feature prominently in this report. In the current and future Australian workforce these issues are central to our understanding of both broad patterns of employment participation, and also the way in which work impacts on wellbeing.

For instance, women's employment participation has been identified as a significant public and private policy issue, given the ageing of the population and the need to maintain productivity and economic growth (Access Economics, 2006; Australian Government, 2010).

Two-thirds of Australians are now in paid work (Australian Bureau of Statistics, 2010) and women's rate of participation has been rising strongly. This has led to a rise in dual-earner households: 63 per cent of couple families with dependent resident children are now dual-earner households. This increases to 75 per cent for parents with a resident full-time student aged 15 to 24 years.

Despite these profound changes in patterns of employment participation, there has not been a corresponding shift in unpaid work. Australian women do around twice as much caring and domestic work as men (Craig, 2007), leaving many women feeling rushed and pressed for time (Australian Bureau of Statistics, 2009).

Sole parents are also increasingly engaged in paid work: 57.6 per cent of sole mothers and 69.0 per cent of sole fathers with dependent children are employed (Australian Bureau of Statistics, 2008).

As the population ages, combining work with elder care will also be increasingly common experience for many workers. As with childcare, women are more likely to be the providers of this care (Page, Baird, Heron, & Whelan, 2009).

There are also significant and ongoing changes around the core parameters of paid work. Work hours and scheduling are changing, moving away from the traditional Monday to Friday 9 to 5 arrangement, to greater diversity in the days worked and length of work hours. There has also been an increase in casual and part-time employment, and at the same time the average number of hours worked in full-time jobs has also increased (Australian Bureau of Statistics, 2006).

A work-life perspective directly engages with the changing nature of the way Australians put together their work, family, caring and other life commitments and how this differs for men and women across the life cycle. It takes into account demands and resources at work and in other life domains to understand how and why paid work can enhance or impair our health, functioning and wellbeing.

In this report we apply a work-life perspective to understand how work hours and their scheduling affect sleep, fatigue and work-life interference, and how this differs for men and women and for those with or without children (aged under 18 years).

### **Existing research on sleep and fatigue**

There is more than a century of research in controlled laboratory studies demonstrating the negative impact of total or partial loss of sleep and disruption to the body clock, during time periods ranging from 24 hours (Dorrian, Lamond, & Dawson, 2000) to several weeks (Van Dongen, Maislin, Mullington, & Dinges, 2003). Sleep loss and circadian disruption result in increased sleepiness, longer reaction times, reduced vigilance and attention (Darwent, et al., 2010; Dorrian, et al., 2003; Lamond & Dawson, 1999; Van Dongen, et al., 2003), memory problems (Walker & Stickgold, 2006), difficulty with reasoning and decision-making (Harrison & Horne, 2000; Lamond & Dawson, 1999) and negative mood change (Dinges, et al., 1997; Paterson, Dorrian, Pincombe, Grech, & Dawson, 2010). There is also evidence of links with increased collisions and off-road incidents (Arnedt, Wilde, Munt, & MacLean, 2000; Dorrian, Lamond, Kozuchowski, & Dawson, 2008; Fairclough & Graham, 1999). Recent research has demonstrated changes in hunger, satiety, food intake, and glucose metabolism (Knutson, Spiegel, Penev, & Van Cauter, 2007; Spiegel, Tasali, Leproult, & Van Cauter, 2009; Van Cauter, Spiegel, Tasali, & Leproult, 2008).

Taken together, laboratory research provides evidence that sleep loss and circadian disruption result in sleepiness, impaired performance, increased incident and accident risk and changes to biological functioning that are suggestive of an increased likelihood of development of health issues such as diabetes and obesity.

Given the seriousness of such findings, field research has been conducted to examine the impact of sleep loss and circadian disruption in real-world populations. Due to their work schedules, shift workers are particularly vulnerable to sleep and circadian difficulties. They are frequently required to work at times when their body is biologically primed for sleep and vice versa. Not surprisingly, it has been shown that shift workers may obtain up to four hours less sleep than day workers (Åkerstedt, 1991; Åkerstedt, 1995). While many shift workers attempt to compensate for sleep loss accrued during workdays by sleeping in on their days off (Dorrian, et al., 2006), this is not always achievable due to domestic, social and recreational commitments (Costa, 1996). For these reasons, shift workers frequently report sleep problems, sleepiness and fatigue (Åkerstedt, 1995; Dorrian, Baulk, & Dawson, 2010; Dorrian, et al., 2008).

Studies in the field have demonstrated that the sleep loss and fatigue associated with shiftwork results in performance decrements. For example, research investigating switchboard operators, air traffic controllers, hospital staff, miners, and train drivers revealed that performance on night shift is significantly more impaired than performance on the day shift (Browne, 1949; Ferguson, Paech, Dorrian, Roach, & Jay, 2010; Heslegrave, 1998; Hildebrandt, Rohmert, & Rutenfranz, 1974; Robbins & Gottlieb, 1990). Recent studies in health care have demonstrated a link between work hours, sleep loss, error and patient safety (Dorrian, et al., 2008; Dorrian, et al., 2006; Landrigan, et al., 2004; Lockley, et al., 2007; Rogers, Hwang, Scott, Aiken, & Dinges, 2004).

Indeed, findings suggest that the increased fatigue experienced by shift workers can lead to increased accident risk (Åkerstedt, 1995; Folkard & Monk, 1979; Rosa, 1995; Rosekind, et al.,

1995). Fatigue is a major contributor to transportation accidents, on the road (Horne & Reyner, 1995; Knippling & Wang, 1994), in rail (Kogi & Ohta, 1975; Lauber & Kayten, 1988; Pearce, 1999; Zhou, 1991) and at sea (Lauber & Kayten, 1988; NTSB, 1990). Investigations have revealed an association between fatigue and human error in major operational catastrophes, for example, the grounding of the oil tanker Exxon Valdez (NTSB, 1990), and the Challenger Space Shuttle disaster (Presidential Commission, 1986).

Long-term effects of shiftwork in relation to health have also been identified. Numerous health problems have been linked to shiftwork, including cardiovascular disease (Åkerstedt & Knutsson, 1997; Åkerstedt, Knutsson, Alfredsson, & Theorell, 1984; Lowden, Moreno, Holmback, Lennernas, & Tucker, 2010), indigestion and gastrointestinal ulcers (Minors et al., 1986; Lowden, et al., 2010) obesity, metabolic syndrome and glucose intolerance (Lowden, et al., 2010). Studies have also shown that female night workers may be at increased risk of reproductive health problems (Axelsson, Rylander, & Molin, 1989; Colligan, Frockt, & Tasto, 1979; Nurminen, 1989, 1998). Furthermore, in certain groups (e.g. nurses, airline cabin attendants), a higher incidence of breast and other cancers have been observed (Davis & Mirick, 2006; Davis, Mirick, & Stevens, 2001; Hansen, 2006, 2010; Schernhammer, et al., 2001). However, it is important to acknowledge that, to date, research into the relationship between shiftwork and health disorders, particularly cancer, has been predominantly observational. Solid evidence based on large-scale epidemiological studies, in combination with well-controlled laboratory experiments, is required. In particular, such work would enable the identification of the exact mechanisms behind the observed health changes. Suggested mechanisms include sleep loss and circadian disruption, lack of recovery time (Binnewies & Sonnentag, 2008; Lowden, et al., 2010), changes in light exposure and hormone levels (Davis & Mirick, 2006) increased consumption of stimulants, sedatives and tobacco (Knauth & Hornberger, 2003; Richardson, Miner, & Czeisler, 1989), and changes in food intake (Lowden, et al., 2010; Waterhouse, Buckley, Edwards, & Reilly, 2003).

### **Why is a work-life perspective on sleep and fatigue needed?**

These studies on sleep and fatigue provide important insights into the work factors that place workers' wellbeing significantly at risk. However, most of this research does not take into account the wider context in which workers conduct and manage their working lives. Caring responsibilities, for example, can create the 'double burden' of work and family demands that is likely to increase the risk of fatigue from long hours or intensive work. Yet we know very little about how work, personal and family life factors combine to increase or decrease sleep and fatigue issues. This report addresses this gap to assist the development of more effective policies and practices to reduce the risk of sleep and fatigue issues.

In work-life research the household, family, social and personal contexts in which an individual engages in paid work are argued to be central to how work affects non-work outcomes such as wellbeing.

Parenting responsibilities involve additional time, commitments, responsibilities and unpaid household work, which adds substantially to the 'struggle to juggle' work and non-work activities. For example, over four years of data collection with the Australian Work and Life Index (AWALI), it has consistently been observed that the negative impact of long work hours, particularly if they are involuntary, is strongest for those with parenting responsibilities (Pocock, et al., 2010). This pattern is also observed in South Australia (Skinner & Pisaniello, 2010).

The effect of work on non-work life also differs for men and women (Pocock, et al., 2010). Men work longer hours, on average, than women. When we statistically control for this difference, women report higher work-life interference than men. Indeed, in part-time work women report

higher work-life interference than men. In full-time work, despite their shorter average hours, women report equivalent levels of work-life strain to men (Pocock et al., 2010).

These findings indicate that women are more likely to experience work-life strains and pressures, and this is particularly the case if they have parenting responsibilities.

The factors that create time strains and pressures for working women are also well documented: lack of quality childcare, inflexible work hours, and inequality in time spent on childcare and domestic work at home (Australian Bureau of Statistics, 2009; Craig, 2007; Craig & Mullan, 2009; Pocock, 2003).

In this study we apply a work-life perspective to sleep issues and fatigue, examining how work hours, work scheduling, gender and care interact to affect these important health outcomes.

## Section 2 Survey sample and measures

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This report uses data collected from the 2010 Australian Work and Life Index (AWALI) survey conducted in South Australia. Detailed findings on work hours and work-life interference can be found in the report *Juggling work-life balance in South Australia* (Skinner & Pisaniello, 2010), available from the Centre for Work and Life website

<http://www.unisa.edu.au/hawkeinstitute/cwl/projects/awali.asp>.

The South Australian AWALI data collection was funded by SafeWork SA, with further funding to collect data on work scheduling, fatigue and sleep issues provided through the 2009 SafeWork SA Commissioned Research Grants Programme.

The South Australian survey sample comprises 969 employed workers (854 employees and 115 self-employed).

The sample was collected by a randomly selected cross-section of the adult South Australian employed population, with data collected by computer-assisted telephone interviews (CATI). Of those successfully contacted by phone, 62.4 per cent participated in the 2010 SA survey. Data was collected over four weekends in March 2010. Newspoll conducted the survey. In accord with usual Newspoll practice, respondents were selected by means of a random sample process which includes a quota set for respondents living in Adelaide city/metropolitan and SA rural/regional areas. Household telephone numbers were selected using random digit dialling and there was a random selection of an individual in each household by means of a 'last birthday' screening question.

The majority of analyses in this report exclude self-employed persons, as self-employment is a qualitatively different way of engaging in paid work compared to being an employee.

Table 1 provides an overview of the SA employee sample. There was a fairly even distribution of men and women in the study sample. Most participants were aged from 30 to 64 years (Gen X and Baby Boomer generations) and just under half had children aged under 18 years. The majority of participants had a University or TAFE/college qualification. The most common occupational group was professionals, followed by clerical and administrative workers, community/personal service workers and technicians/trade workers.

One-third of SA employees work part-time, an arrangement more common for women (50.3 per cent) than men (12.5 per cent). Full-time work is more common for men, especially long full-time hours: nearly 40 per cent of men work 45+ hours compared to 15 per cent of women.

The majority of employees work standard schedules between 8 am to 6 pm. Around one-third work non-standard schedules outside these hours. Only 10 per cent of the sample work non-standard shifts that include night work (at least 7 hours in the last month).

Table 1 Overview of the AWALI 2010 SA employee\_sample, per cent (frequency in parentheses)

	Men	Women	All
<b>All</b>	48.6 (415)	51.4 (439)	100.0 (854)
<b>Age</b>			
18 – 19 years	5.3 (22)	5.0 (22)	5.2 (44)
20 – 29 years	17.6 (73)	15.9 (70)	16.7 (143)
30 – 44 years	36.1 (150)	37.4 (164)	36.8 (314)
45 – 64 years	38.1 (158)	40.1 (176)	39.1 (334)
65+	2.9 (12)	1.6 (7)	2.2 (19)
<b>Parenting responsibilities</b>			
Children aged under 18 years	51.8 (215)	45.1 (198)	48.4 (413)
<b>Highest level of education</b>			
University degree	27.5 (114)	31.2 (137)	29.4 (251)
TAFE/college	44.3 (184)	33.9 (149)	39.0 (333)
Secondary school	28.2 (117)	34.9 (153)	31.6 (270)
<b>Occupation</b>			
Manager	12.3 (51)	5.5 (24)	8.8 (75)
Professional	21.5 (89)	25.5 (111)	23.6 (200)
Technician/trade	23.0 (95)	3.2 (14)	12.8 (109)
Community/personal service	5.6 (23)	20.6 (79.6)	13.3 (113)
Clerical and administrative	7.5 (31)	25.5 (111)	16.7 (142)
Sales	6.3 (26)	10.8 (47)	8.6 (73)
Machinery operators	11.1 (46)	1.1 (5.0)	6.0 (51)
Labourers	12.6 (52)	7.8 (34)	10.1 (86)
<b>Work hours</b>			
Part-time (< 35 hrs per week)**	12.5 (52)	50.3 (221)	32.0 (273)
Full-time (35+ hrs per week)**	87.5 (363)	49.7 (218)	68.0 (581)
Full-time 35 – 44 hours**	48.9 (203)	34.3 (150)	41.4 (353)
Full-time 45+ hours**	38.6 (160)	15.1 (66)	26.5 (226)
<b>Work schedule</b>			
Work hours within 8 am to 6 pm (standard schedule)	58.9 (244)	75.1 (329)	67.3 (573)
Work hours not within 8 am to 6 pm (non-standard schedule)	41.1 (170)	24.9 (109)	32.7 (279)
Non-standard shift – no night work**	19.8 (75)	15.6 (66)	17.6 (141)
Non-standard shift – including night work for 7+ hours**	15.6 (59)	6.4 (27)	10.8 (86)

Note. \*\*Proportion of total sample of employees. Unweighted data.

## Measures

Survey items that are not self-evident in the report are described here. All survey items are provided in the Appendix

### *Sleep issues and fatigue*

Sleep issues were assessed by two items addressing the frequency with which respondents 'get more than 7 hours of sleep each night' and the frequency with which 'work causes you to get less sleep than you need'.

Seven hours of sleep a night is the minimum recommended time for healthy functioning; regularly having less than seven hours of sleep has been associated with a range of adverse outcomes including reduced cognitive functioning and increased risk of various detriments to physical health (Banks & Dinges, 2007).

The third question addressed fatigue, and was adapted from the widely used Samn-Perelli Fatigue Scale (Samn & Perelli, 1982). Respondents indicated the frequency with which they felt 'extremely tired or completely exhausted'. These two descriptors represent the highest two levels of fatigue on the Samn-Perelli scale, combined into a single item.

### *Work-life interference*

The five-item work-life index is used to measure work-life interference. This measure has been used across four years of data collection as part of the Australian Work and Life Index (AWALI). The five items assess perceptions of work-life interference focusing on 'general interference' (frequency that work interferes with responsibilities or activities outside work), 'time strain' (frequency that work restricts time with family or friends), work-to-community interference, (frequency that work affects workers' ability to develop or maintain connections and friendships in their local community), satisfaction with overall work-life 'balance' and frequency of feeling rushed or pressed for time. These five items are summed to arrive at an overall work-life index that is scaled from 0 (lowest work-life interference) to 100 (highest work-life interference).

### *Work schedule*

Participants were asked a series of questions about their work scheduling, including the range of shift times (early morning, morning, afternoon, evening, night). The number of participants working specific shifts is too small to support a detailed analysis of different shift starting times.

It is possible however to distinguish between:

- Those working a standard daytime schedule between 8 am to 6 pm and those working a non-standard schedule outside these hours;
- Those working non-standard schedules that include working at night (between 10 pm and 6 am) and those that work other non-standard schedules that do not include nights.

To identify workers who work a substantive amount of night work (i.e. not just a few hours on occasion), night work was defined as working at least seven hours between 10 pm and 6 am in the last four weeks, the equivalent of at least one shift.

## Section 3 Work hours, gender and parenting

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In this section we examine the prevalence of sleep issues and fatigue in the SA working (employee) population, and how this differs for men and women.

Gender is an important factor to take into account when considering the effects of work on sleep and fatigue. On average, women work fewer paid work hours than men; they are more likely to work part-time and less likely to work longer full-time hours (Pocock, et al., 2010). On the other hand, Australian women, on average, spend more time on domestic and care work, which increases their (unpaid) work load compared to men (Craig, 2007; Grimshaw & Murphy, 2005; Pocock, 2005).

In this report we examine who is most at risk of fatigue as defined by their gender, parenting status, work hours and scheduling and employment characteristics (occupation, employment contract, self-employment). The aim is to identify which work-life configurations are most likely to result in fatigue and unhealthy sleep patterns for men and women.

The SafeWork SA Code of Practice for Working Hours identifies a range of potential hazards related to work hours and their scheduling, that increase the risk of fatigue, and related negative outcomes such as injuries, health detriments and reduced productivity. In this report the focus is on two key dimensions of work hours identified in the Code as potential hazards: the length of work hours (per day and week) and the scheduling of work (standard versus non-standard schedules).

In the first part of the analysis we examine gender differences in sleep issues and fatigue, and investigate whether parenting responsibilities differentially affect men's and women's sleep and fatigue.

It is well established that long work hours increase the risk of fatigue (De Lange, et al., 2009; De Raeve, Vasse, Jansen, van den Brandt, & Kant, 2007). In this report we examine the relationship between work hours and fatigue comparing part-time and full-time work, and longer hours (45+) in full-time work. We apply a work-life lens by examining differences between men and women, with a particular focus on how the combination of work hours and parenting responsibilities affects the relationship between working time/scheduling and fatigue.

### 3.1 Gender differences in sleep issues and fatigue

As Table 2 shows, a substantial proportion of employees, 30.4 per cent, report frequent fatigue (extremely tired or completely exhausted). An additional 42.3 per cent of employees report sometimes feeling fatigued.

A significant proportion (28.5 per cent) of workers also report that they never or rarely get more than seven hours of sleep at night, with a further 26.3 per cent reporting that they only sometimes get more than seven hours sleep at night.

The direct attribution of sleep problems to work is less common than the reported frequency of insufficient sleep (less than seven hours). Only 15.4 per cent of employees report that work hours frequently prevent them from getting as much sleep as they need.

There are also gender differences in sleep issues and fatigue. Men are more likely to report that work hours restrict their sleep (18.9 per cent; 12.1 per cent of women). Men are also less likely to regularly get sufficient sleep; 32.5 per cent of men never or rarely sleep more than seven hours compared to 24.5 per cent of women. On the other hand, women are more likely to report frequent fatigue (36.8 per cent; 23.7 per cent of men).

Table 2 Frequency of sleep and fatigue problems, by gender, per cent

	Never/Rarely	Sometimes	Often/almost always
<b>Feel extremely tired\completely exhausted (fatigue)</b>			
Men	31.7	44.6	23.7
Women	23.1	40.0	36.8
All	27.3	42.3	30.4
<b>Get more than 7 hours of sleep each night (insufficient sleep)</b>			
Men	32.5	23.7	43.8
Women	24.5	28.9	46.6
All	28.5	26.3	45.2
<b>Work hours cause less sleep than you need (work-related sleep restrictions)</b>			
Men	56.7	24.4	18.9
Women	64.8	23.1	12.1
All	60.8	23.7	15.4

Note. Analysis excludes self-employed persons.

We now turn to a more in-depth analysis of each of the sleep and fatigue measures, examining the intersection between gender, parenting and work hours.

### 3.2 Work-related sleep restrictions

#### *Work-related sleep restrictions and parenting*

Overall, men are more likely to report that work frequently restricts their sleep compared to women (Figure 1), and this is the case for employees with or without children aged under 18 years. This is most likely due to the longer work hours per week reported by men (42.4 hours) compared to women (30.4 hours). Although parents are slightly more likely to report frequent work-related sleep restrictions, this contrast is not statistically significant for employees overall, nor between men and women.

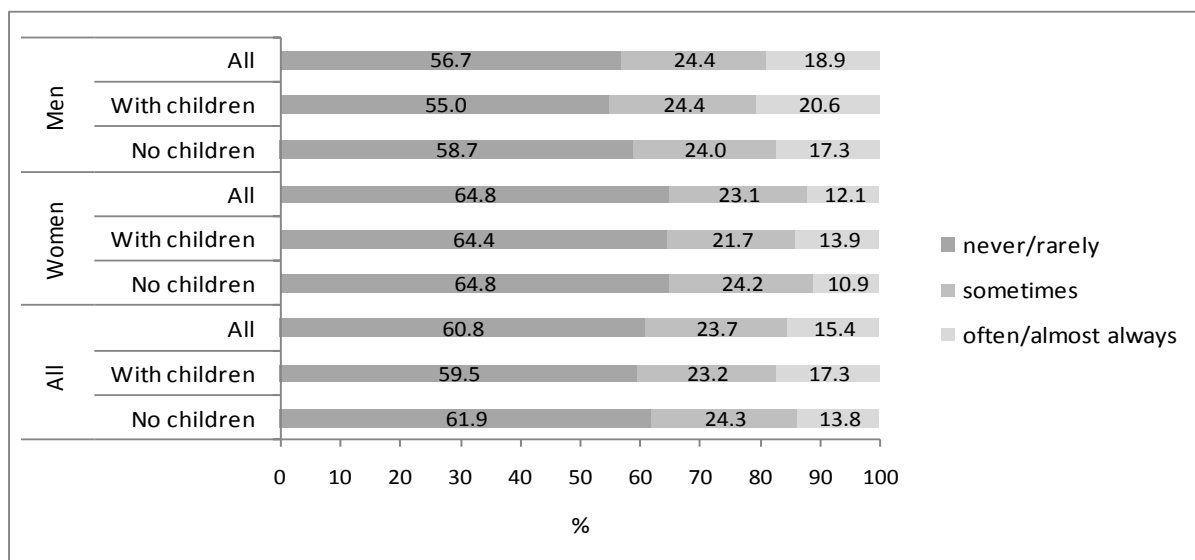


Figure 1 Frequency that work causes employees to sleep less than needed, by gender and parenting status, per cent

### *Work-related sleep restrictions in full-time and part-time employment*

As expected, the length of work hours is clearly associated with work-related sleep restrictions. Work frequently causes sleep restrictions for 18.1 per cent of full-time employees (Figure 2) compared to only 10.0 per cent of part-time employees (Figure 4, page 26).

There is some indication that full-time men are more likely to report frequent sleep restrictions than their female counterparts, although this difference is not statistically significant (most likely due to the small number of full-time women reporting frequent sleep restrictions).

The difference between full-time and part-time workers is most evident for parents. One-fifth (21.9 per cent) of full-time workers with children report that work frequently restricts sleep, compared to only 9.2 per cent of part-timers with children (Figure 4, page 26). In contrast, only five per cent more full-time workers without children report frequent sleep restrictions (15.0 per cent) compared to their part-time counterparts (10.8 per cent).

This suggests that the combination of full-time work with parenting particularly increases the risk of work-related sleep restrictions.

Looking just at full-time employees, parents are slightly more likely to report work-related sleep restrictions compared to those employees who do not have children aged under 18 years, although this difference is not statistically significant.

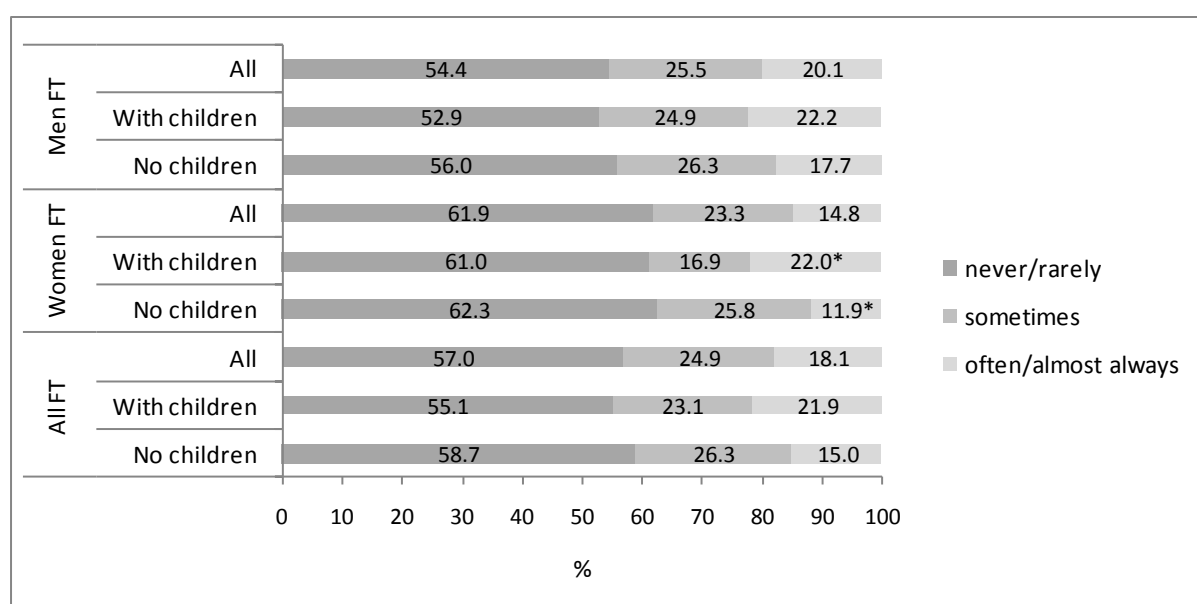


Figure 2 Frequency that work causes employees to sleep less than needed, by gender and parenting status, full time employees, per cent

Note. \*Estimate unreliable due to insufficient sample size.

### *Work-related sleep restrictions and long work hours*

The SafeWork SA Code of Practice on Working Hours identifies working longer than 40 weekly hours as increasing the risk of injury, health detriments and productivity losses due to fatigue and inadequate rest and recovery.

There is no agreed definition of ‘long hours’ in the research literature. The International Labour Organisation (ILO) defines 48+ hours as ‘very long’ (Boulin, Lallement, Messenger, & Michon, 2006), and others use a similar cut-off (Kelley, 2001; Wooden & Loundes, 2001). The EU’s Working Time Directive (European Parliament, 2003) places an upper limit on weekly working hours of 48 hours, including overtime. In the research literature distinctions are also made

between 'long' hours (45 to 48) and very long hours (49+) (Dawson, McCulloch, & Baker, 2001; Healy, 2000).

In this study long full-time hours are defined as 45 or more weekly hours (including paid and unpaid overtime). This cut-off fits with the Safe Work SA Code of Practice on Working Hours in which 35 to 40 hours are considered to present a lower risk of injury or illness, with the level of risk increasing as work hours lengthen beyond these benchmarks.

Long full-time hours are more common for men compared to women. Of those working full-time, 43.1 per cent of men and 29.8 per cent of women work long full-time hours (45+) (38.3 per cent of full-timers overall). Put another way, 71.7 per cent of employees working long full-time hours are men.

As these long full-time hours are less common for women it is not possible to conduct gender comparisons on the fatigue and sleep measures for long hours workers.

As Figure 3 shows, there is a clear association between longer full-time hours and work-related sleep restrictions. Nearly thirty per cent (28.0) of employees working long full-time hours experience frequent work-related sleep restrictions, compared to 11.9 per cent of those working standard (35-44) full-time hours.

There is some indication that parents working long full-time hours are particularly likely to experience frequent sleep restrictions compared to their counterparts without children, however this contrast does not reach statistical significance (most likely due to the small sample size of long hours workers with frequent sleep restrictions).

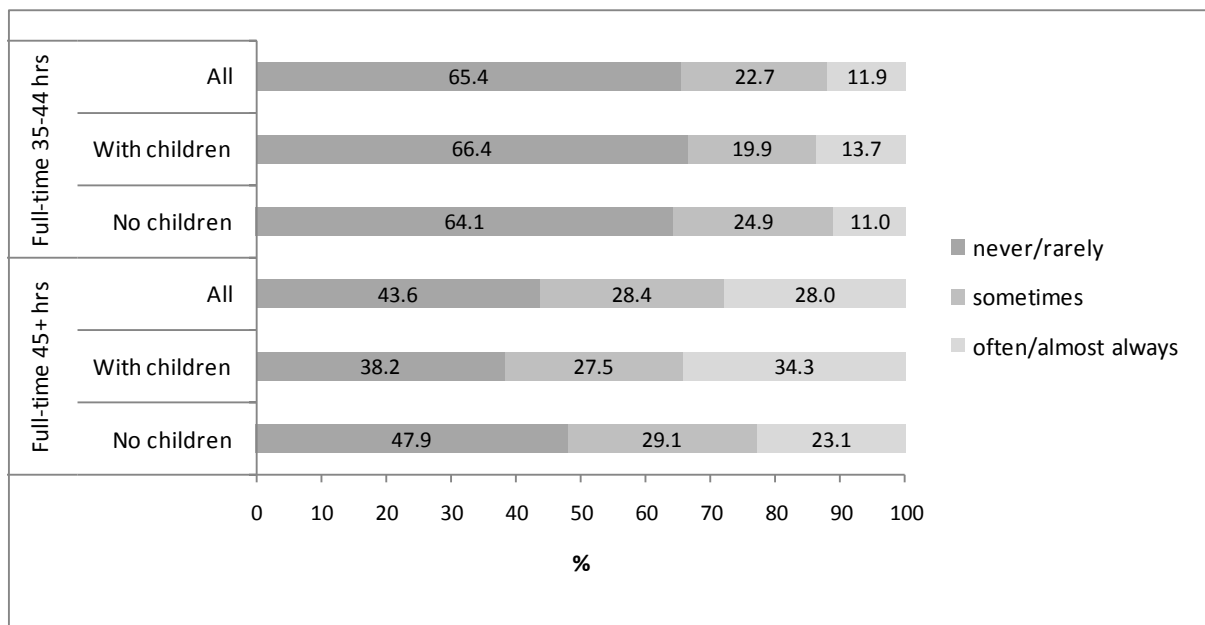


Figure 3 Frequency that work causes employees to sleep less than needed, by parenting status, standard and long full-time hours, per cent

As expected, work-related sleep restrictions are rare for part-time employees (Figure 4). Analyses of part-time workers are restricted due to the small number of men working part-time, and the small number of part-timers reporting frequent sleep restrictions. Reliable estimates are only available for women working part-time. The majority of women in part-time work (67.4 per cent) never or rarely have work-related sleep restrictions, a minority (9.7 per cent) frequently find work restricts their sleep.

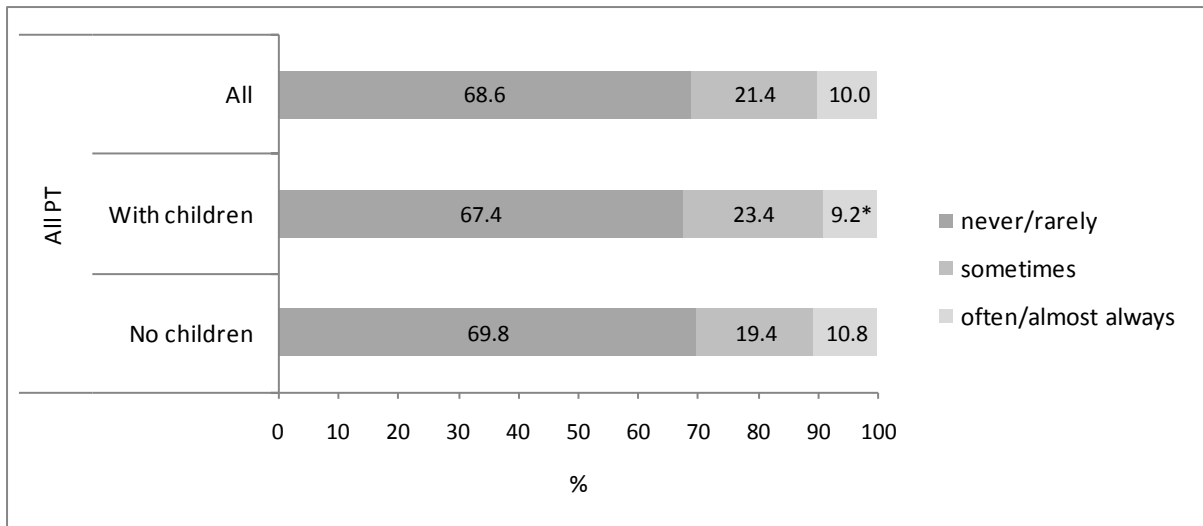


Figure 4 Frequency that work causes employees to sleep less than needed, by parenting status, part time employees, per cent

Note. \*Estimate unreliable due to insufficient sample size.

**In sum**, working longer hours increases the likelihood of work-related sleep restrictions for all workers, with parents most strongly affected.

### 3.3 Having insufficient sleep

#### *Parenting and insufficient sleep*

Overall, 28.5 per cent of employees report they never or rarely get more than seven hours sleep at night. This rises to 33.0 per cent for parents (24.7 per cent of those without children) (Figure 5).

Fathers in particular are likely to report insufficient sleep: 40.2 per cent of fathers never or rarely get more than seven hours of sleep a night compared to one quarter of men without children, and women with or without children.

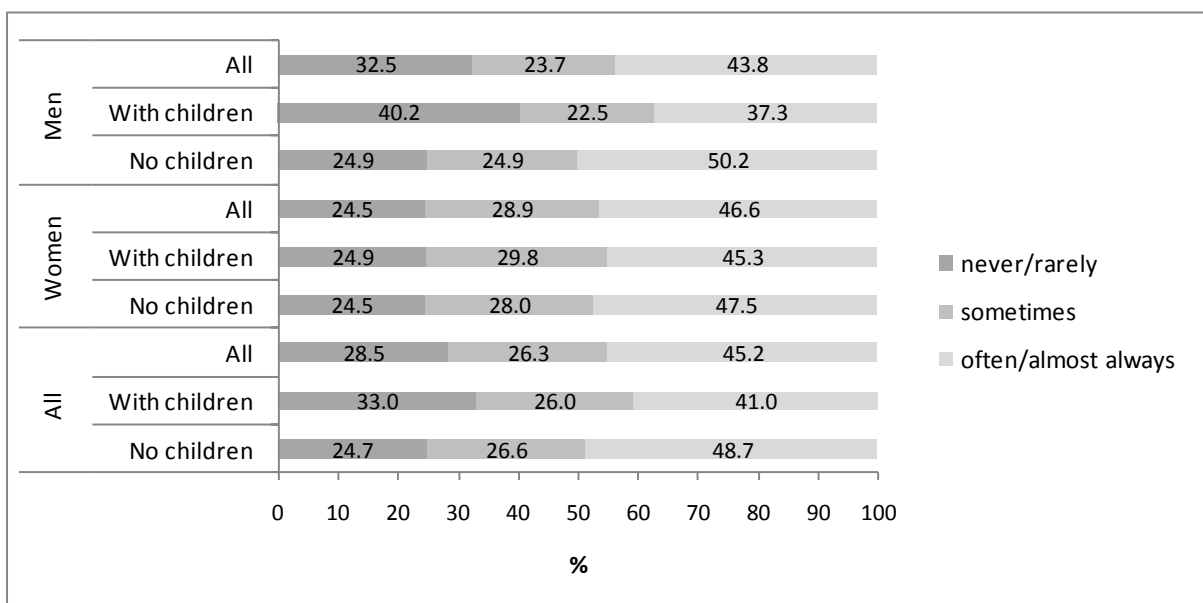


Figure 5 Frequency of employees having seven or more hours of sleep, by gender and parenting status, per cent

*Full-time and part-time work and insufficient sleep*

As expected, longer work hours are significantly associated with the likelihood of having insufficient sleep, with similar patterns by gender and parenting status as observed for work-related sleep restrictions (Figure 6).

Nearly one-third (32.1 per cent) of full-time employees never or rarely get sufficient sleep.

There is a clear relationship between parenting and insufficient sleep for full-time workers. Full-time workers with children are more likely to report insufficient sleep (40.9 per cent), compared to those without children (25.5 per cent), and this is evident for men and women (although this contrast is only statistically significant for men). Although there is some indication of gender differences, this is not statistically significant.

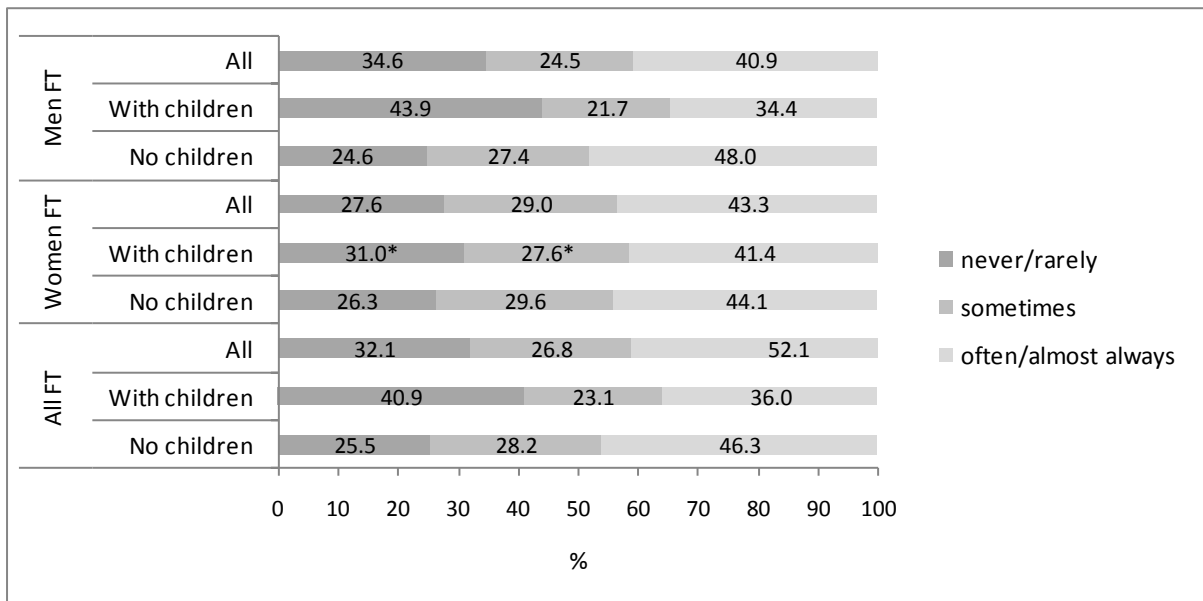


Figure 6 Frequency of employees having seven or more hours of sleep, by gender and parenting status, full time employees, per cent

Note. \*Estimate unreliable due to insufficient sample size.

*Long work hours and insufficient sleep*

There is also a clear relationship between longer full-time hours and insufficient sleep (Figure 7). Almost forty per cent (37.9) of long hours’ employees never or rarely get more than seven hours sleep, compared to around thirty per cent (28.6) of those working standard full-time hours.

Again there is a clear effect of parenting. Regardless of whether they work standard or longer full-time hours, parents are more likely to have insufficient sleep compared to those without children.

The combination of parenting and long hours particularly increases the risk of insufficient sleep. The difference between standard and long full-time hours is only statistically significant for parents: 47.1 per cent of parents working long hours never, or rarely, sleep more than seven hours compared to 36.6 per cent of parents working standard full-time hours. The magnitude of the contrast is smaller and not statistically significant for those without children aged under 18 years.

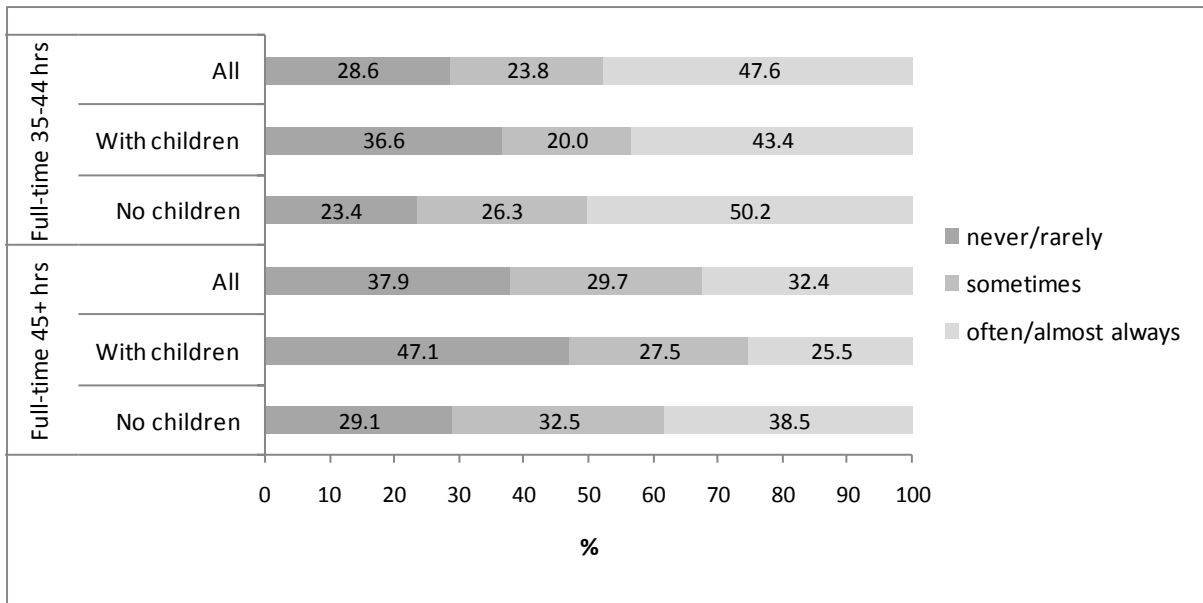


Figure 7 Frequency of employees having seven or more hours of sleep, by parenting status, standard and long full-time hours, per cent

There is a clear difference between part-timers (Figure 8) and full-timers (Figure 6) in the proportion of workers who report insufficient sleep (21.1 per cent of part-timers; 32.1 per cent of full-timers).

Again, only amongst parents do we observe a statistically significant association between longer work hours and sleep issues. Nearly double the proportion of full-timers with children report never or rarely getting more than seven hours sleep compared to part-timers with children (40.9 per cent full-timers; 19.1 per cent part-timers). For those without children aged under 18, there is no difference between part-timers and full-timers in the likelihood of insufficient sleep.

Within part-time work there is no statistically significant contrast between parents and those without children in the frequency of insufficient sleep. Sample size restrictions prevent further analysis of gender and parenting status in part-time work.

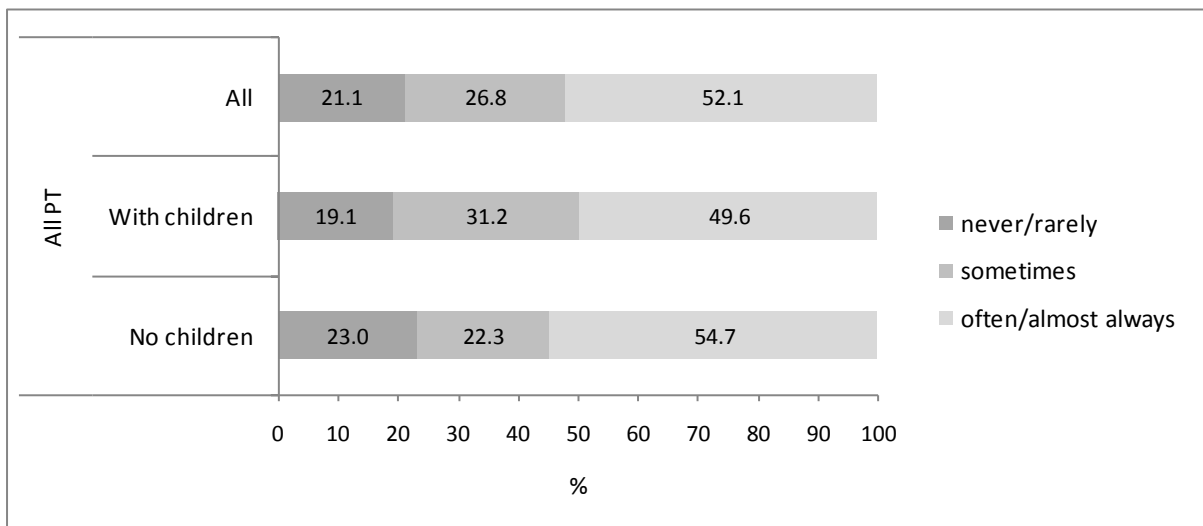


Figure 8 Frequency of employees having seven or more hours of sleep, by gender and parenting status, part time employees, per cent

**In sum**, longer hours also increase the likelihood of having insufficient sleep. Again, it is for those with parenting responsibilities that this relationship between hours and sleep issues is strongest.

### 3.4 Feeling fatigued (extremely tired or completely exhausted)

As observed previously, women are more likely to report frequent fatigue compared to men. In this section we examine how gender intersects with parenting and work hours with regard to fatigue.

#### *Fatigue, work hours and parenting*

Figure 9 shows that 30.4 per cent of all employees regularly feel fatigued, with little difference between those with children (aged under 18 years) and those without children.

Regardless of their parenting status, women are more likely to experience frequent fatigue compared to men. Nearly 40 per cent (38.9) of women with children report frequent fatigue compared to only 24.9 per cent of men with children. Women without children are also more likely to report frequent fatigue compared to their male counterparts.

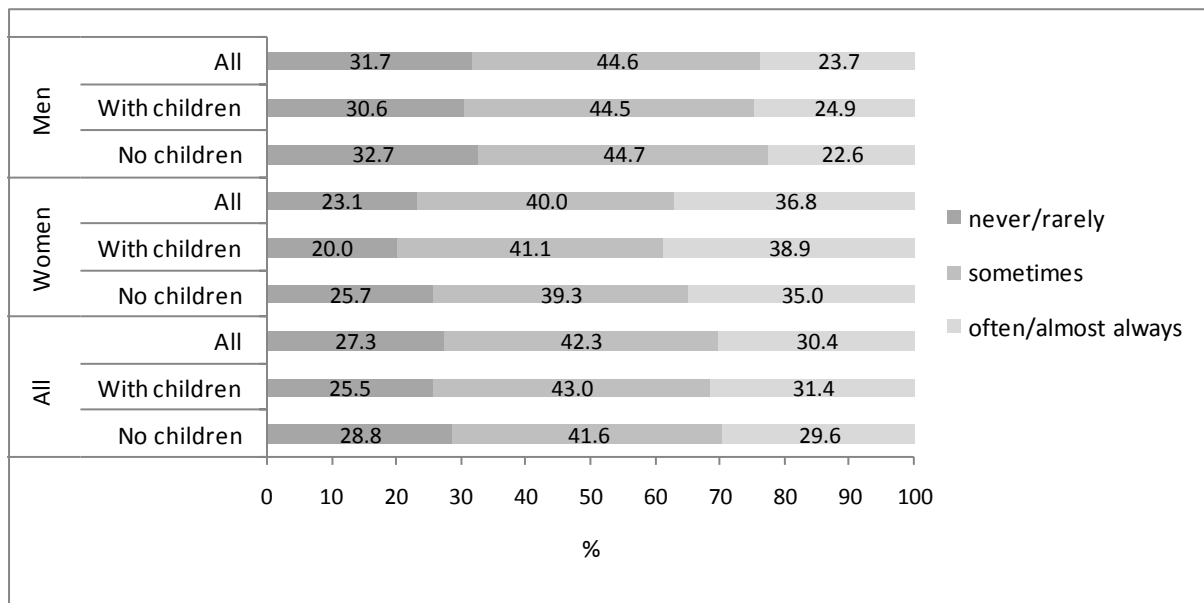


Figure 9 Frequency of fatigue, by gender and parenting status, per cent.

Note. \*Estimate unreliable due to insufficient sample size.

#### *Part-time and full-time work and fatigue*

The relationship between work hours and fatigue is more complex. As Figure 10 and Figure 11 show, there is little difference in the occurrence of frequent fatigue between full-time (28.9 per cent) and part-time (33.2 per cent) workers. The slightly higher rate of fatigue in part-time work most likely reflects the predominance of women in this work.

When we consider only women, mothers in full-time work are more likely to be frequently fatigued (47.5 per cent) compared to their part-time counterparts (34.7 per cent). For women without children the opposite pattern is evident, those in part-time work are more likely to be frequently fatigued (38.1 per cent) compared to their full-time counterparts (33.6 per cent). The number of men working part-time is insufficient to support further analysis.

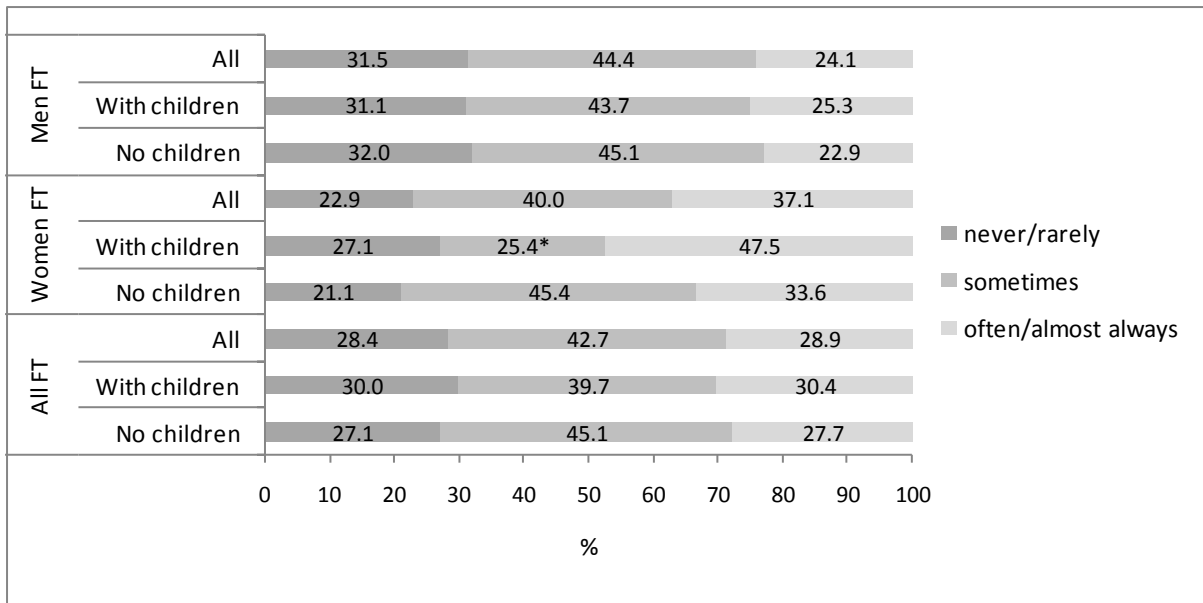


Figure 10 Frequency of fatigue, by gender and parenting status, full-time employees, per cent.  
 Note. \*Estimate unreliable due to insufficient sample size.

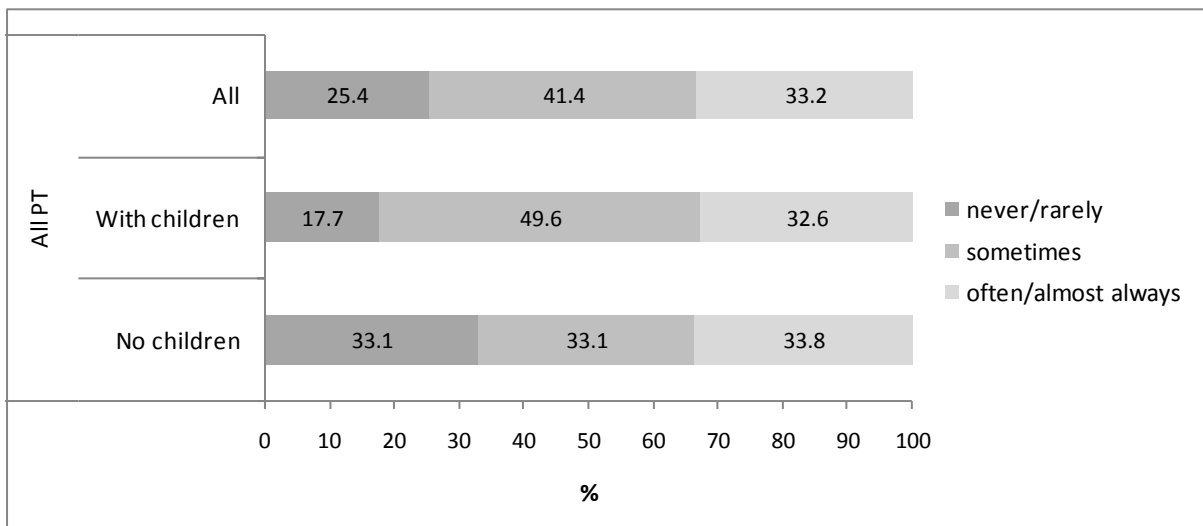


Figure 11 Frequency of fatigue, by gender and parenting status, part-time employees, per cent.

*Long work hours and fatigue*

There is little difference in the frequency of employees experiencing fatigue between those working standard compared to long full-time hours. Nor is there any evidence that combining parenting with long hours increases the likelihood of fatigue (Figure 12). Around 30 per cent of full-timers frequently feel fatigued, and this is the case for those working standard or long hours, and for those with or without children.

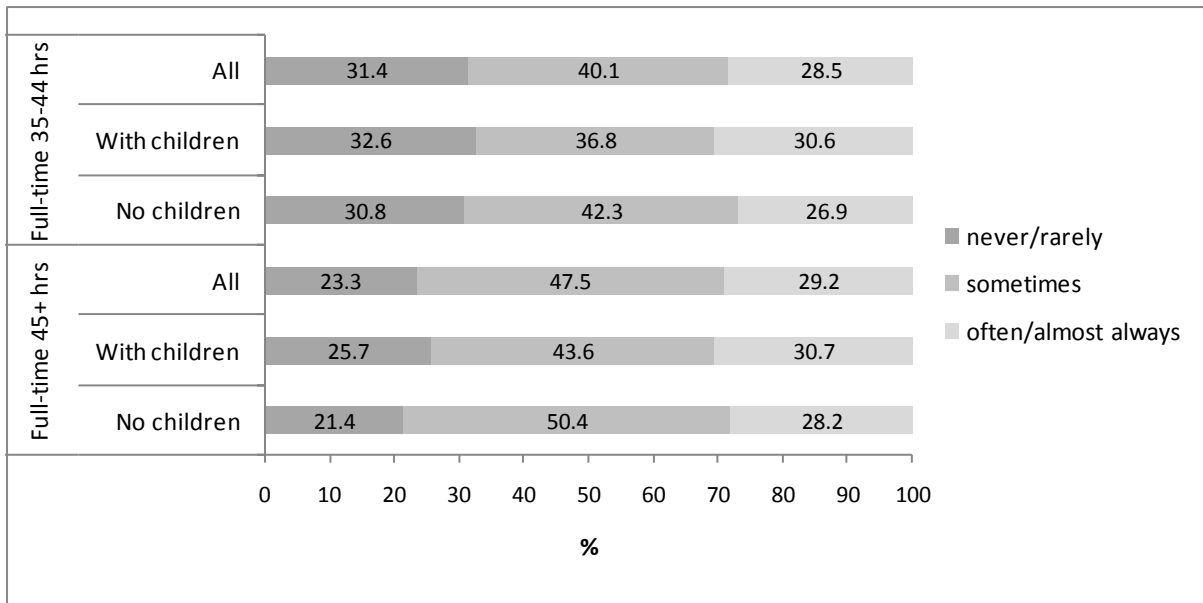


Figure 12 Frequency of fatigue by standard and long full-time hours, per cent

**In sum**, women are most likely to report frequent fatigue, regardless of their parenting status. Overall, mothers working full-time are at most at risk of frequent fatigue.

### 3.5 Identifying the length of work day and week associated with sleep issues and fatigue

The previous analyses have highlighted the clear association between longer hours and increased risk of sleep issues and fatigue. Work hours were examined using fairly broad distinctions between part-time, standard (35 to 44) and long (45+) full-time hours of work. Here we provide a more detailed and focused analysis of the relationship between work hours and fatigue/sleep issues by examining the average daily and weekly work hours associated with frequent fatigue and sleep issues.

Here we focus on full-time work hours, as the previous analyses have shown it is longer full-time hours (45+) that are clearly associated with increase risk of sleep issues. The aim is to identify more precise benchmarks for the length of full-time work hours that increase the risk of sleep issues and fatigue.

#### *Average length of work day and work week*

Overall, the average full-time work day is 8.8 hours (44.7 weekly hours). There is a clear, and statistically significant, pattern of longer work hours and increased frequency of work-related sleep restrictions (Table 3).

Full-time employees reporting frequent work-related sleep restrictions work 9.6 hours a day, and 49.1 hours per week (on average). In contrast, those who rarely experience sleep restrictions work a standard 8.4 hour day, and 42.6 full-time weekly hours.

This is consistent with the Safe Work SA Code of Practice on Working Hours which identifies daily work hours of 9+ hours as a medium risk for injury and illness, and weekly hours of above 40 as increasing the risk of these negative outcomes.

There is very little difference between those with and without children in the average work hours (daily, weekly) associated with the frequency of work-related sleep restrictions.

There are gender differences in the average daily and weekly work hours associated with frequent work-related sleep restrictions. To some extent these differences reflect the general trend for men to work longer hours than women. As observed previously, men are more likely to work long (45+) full-time hours (38.6 per cent of all male employees; 15.6 per cent of all female

employees). These patterns are also evident in the national Australian AWALI data (Pocock, et al., 2010).

Table 3 Frequency that work causes less sleep than needed, by average length of work day and week

	Work day		Work week
Men			
Never/rarely	8.5		43.7
Sometimes	9.2		47.4
Often/almost always	9.9		50.5
Women			
Never/rarely	8.3		41.0
Sometimes	8.7		43.9
Often/almost always	9.1		46.1
All			
Never/rarely	8.4		42.6
Sometimes	9.0		46.2
Often/almost always	9.6		49.1

Work hours also differ for those who usually get sufficient sleep (more than seven hours) compared to those who do not (Table 4).

Full-time employees who consistently report insufficient sleep work on average 8.9 hours a day, 45.9 hours per week. Those who regularly have sufficient sleep, work shorter daily (8.6) and weekly hours (43.4). Although these contrasts are modest, they are statistically significant. There is little difference in these patterns by parenting status.

These differences in work hours are only statistically significant for men. Indeed, there is little difference in women's work hours according to the frequency of work-related sleep restrictions or insufficient hours of sleep. This may reflect the greater proportion of men working long (45+) full-time hours. It is likely that the relationship between work hours and sleep issues is more evident at the upper end of full-time work hours, as time becomes increasingly scarce to fit in sleep around other work and life commitments (i.e. family, social, personal, household).

For men, the clearest difference in work hours is evident between those who regularly (often/almost always) having sufficient sleep with a 8.5 hour day and 44.4 hour week, compared to those who only sometimes or never/rarely have more than seven hours sleep who work around nine hours a day, and 47 hours a week.

Table 4 Frequency of having seven or more hours of sleep, by average length of work day and week

	Work day		Work week
Men			
Never/rarely	8.9		47.1
Sometimes	9.3		47.2
Often/almost always	8.7		44.4
Women			
Never/rarely	8.8		43.5
Sometimes	8.5		42.2
Often/almost always	8.3		41.9
All			
Never/rarely	8.9		45.9
Sometimes	9.0		45.1
Often/almost always	8.6		43.4

This is consistent with the Safe Work SA Code of Practice on Working Hours in which the risk of fatigue and other negative outcomes is indicated to increase with working more than 40 weekly hours or more than 9 daily hours.

The association between fatigue (feeling extremely tired/completely exhausted) and work hours is not as strong (Table 5).

As observed with the insufficient sleep measure, it is only for men that more frequent fatigue demonstrates a statistically significant association with longer hours. Men who are frequently fatigued work 9.4 daily hours on average (47.5 weekly hours) compared to an 8.7 hour day (44.0 hours) worked by men who are rarely or never fatigued.

Women’s work hours show little variation with frequency of fatigue. This suggests that factors other than length of work hours impact on women’s fatigue. The most likely explanation is the greater workload that many women carry with regard to unpaid caring and domestic work. Regardless of whether they work part-time or full-time, this extra unpaid workload creates busy and pressured lives for many women (Higgins, et al., 2000; Pocock, et al., 2010; Walsh, 2007; Williams, et al., 2009), and most likely contributes significantly to their frequent feelings of tiredness and exhaustion.

As observed on the two sleep measures, there is little difference in these estimates for employees with or without children.

Table 5 Frequency of fatigue, by average length of full-time work day and week

	Work day		Work week
		Men	
Never/rarely	8.7		44.0
Sometimes	8.9		46.6
Often/almost always	9.4		47.5
		Women	
Never/rarely	8.3		41.3
Sometimes	8.6		43.1
Often/almost always	8.5		42.4
		All	
Never/rarely	8.6		43.2
Sometimes	8.8		45.4
Often/almost always	8.9		45.1

**In sum**, consistent with the SafeWork SA Code of Practice on Working Hours, average daily work hours above eight hours and average weekly hours above 40 hours are associated with frequent sleep issues. These patterns are particularly evident for men, reflecting their longer (average) work hours and predominance amongst long hours (45+) workers. Women’s sleep issues and fatigue are less sensitive to length of work hours, most likely reflecting their shorter (average) work hours. Unpaid caring and domestic workloads, combined with paid work, are more likely to impact on women’s sleep and fatigue.

## Section 4 Work scheduling, gender and parenting

---

It is well established that non-standard work scheduling, such as shift work, is associated with an increased risk of fatigue and sleep issues. The SafeWork SA Code of Practice on Working Hours identifies a range of potential hazards associated with the scheduling of work, including irregular or unpredictable hours, speed and direction of shift schedules and changes, fly-in-fly-out arrangements and various aspects of night work.

In this report, we examine the effects of working standard day-time (work between 8 am and 6 pm) and non-standard scheduling (outside 8 am to 6 pm), and we also consider night work (between 10 pm and 6 am). To identify workers who work a substantive amount of night work (i.e. not just a few hours on occasion), we focus here on those who reported at least seven hours (the equivalent of at least one shift) of night work in the past month.

The categorisation of non-standard shift schedules in this report covers a range of arrangements, including morning, afternoon, evening and night shifts. It was possible for most analyses to distinguish between those working non-standard shift schedules that included night work (between 10 pm and 6 am) and those that did not work nights as part of their non-standard schedules. Sample size restrictions prevent more detailed analysis of different types of shift work.

As observed in Table 1, one third (32.7 per cent) of SA employees work non-standard shifts. Just over ten per cent (10.8) work night shifts, and 17.6 per cent work non-standard shifts that do not include night work.

As we describe below, there is a clear and strong association between working non-standard hours and increased likelihood of sleep issues and fatigue. Night work (between 10 pm and 6 am) has the strongest association with these outcomes. In the current sample only a small number of employees on standard work schedules report frequent sleep issues and fatigue. This places restrictions on some analyses with regard to differentiating employees by gender and parenting status.

### 4.1 Work-related sleep restrictions

As Figure 13 shows, nearly thirty per cent (31.2 per cent) of employees working non-standard schedules frequently have work-related sleep restrictions, compared to less than ten per cent of those who work standard work schedules. For those on non-standard schedules, work-related sleep restrictions are more common for those with children aged under 18 years (37.2 per cent) compared to those without children (25.0 per cent), and this is the case for men and women. In contrast, for those working standard schedules there is no difference between those with or without children.

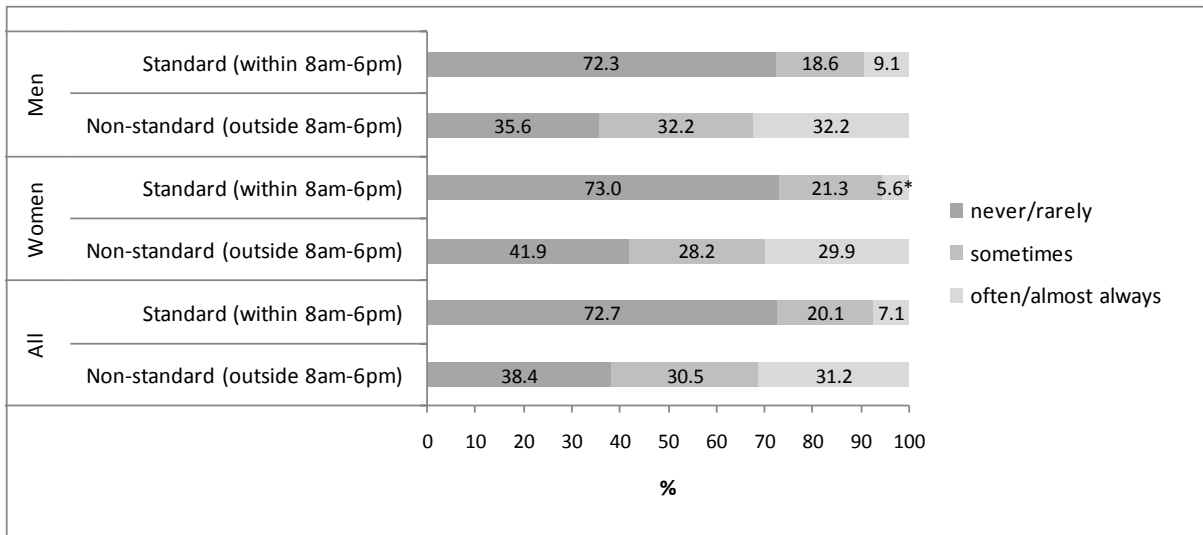


Figure 13 Frequency that work causes employees to sleep less than needed, by work schedule and gender, per cent

Note. \*Estimate should be interpreted with caution due to small sample size.

Night work between 10 pm and 6 am is strongly associated with work-related sleep restrictions (Figure 14); 52.4 per cent of employees who work night shifts have frequent work-related sleep restrictions, compared to 20.1 per cent of those on non-standard shifts that do not include night work.

Parents are particularly negatively affected: 59.6 per cent of parents working night shifts say that work frequently restricts their sleep. Sample size restrictions prevent analysis of parents working other non-standard schedules without night work.

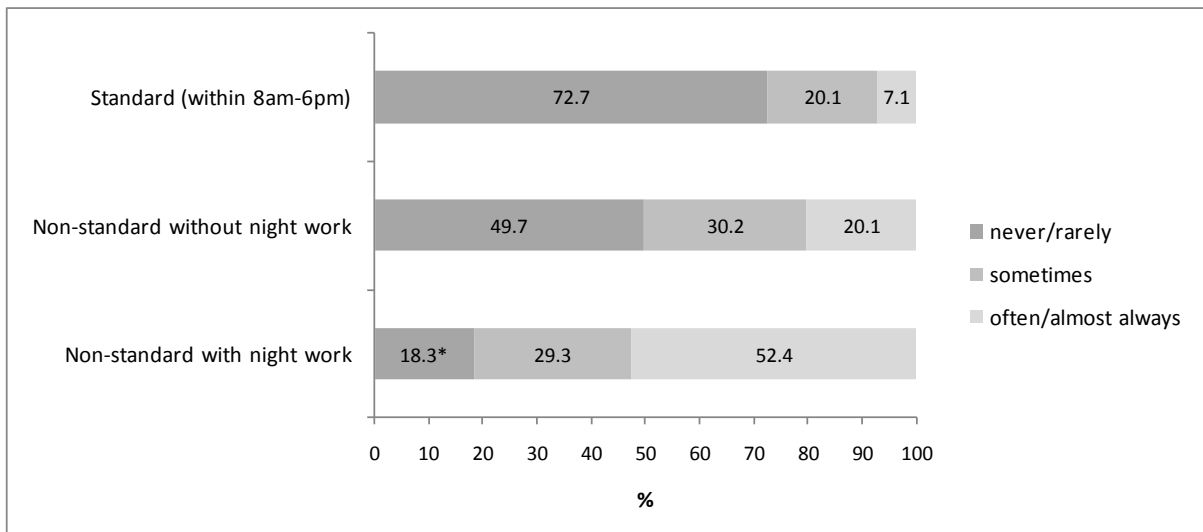


Figure 14 Frequency that work causes sleep less than need, by night work, per cent

Note. \*Estimate should be interpreted with caution due to small sample size.

#### 4.2 Having insufficient sleep – less than seven or more hours per night

Non-standard schedules also increase the likelihood of insufficient amounts of sleep (less than seven hours). As Figure 15 shows, around one third of employees on non-standard schedules never or rarely have sufficient sleep (7+ hours), compared to around one quarter of those on standard schedules. Whilst these patterns can be observed for men and women, this contrast is only statistically significant for men.

Overall, men are more likely than women to report having insufficient sleep with standard and non-standard schedules, although this gender difference is only statistically significant for those on standard schedules.

Combining parenting with non-standard work schedules increases the risk of having insufficient sleep. A substantial proportion of parents (39.0 per cent), who work non-standard work schedules never, or rarely, have more than seven hours sleep compared to 29.5 per cent of parents on standard schedules. For those without children, around one quarter report never, or rarely, having sufficient sleep (26.4 per cent of those on non-standard schedules; 24.1 per cent of those on standard schedules).

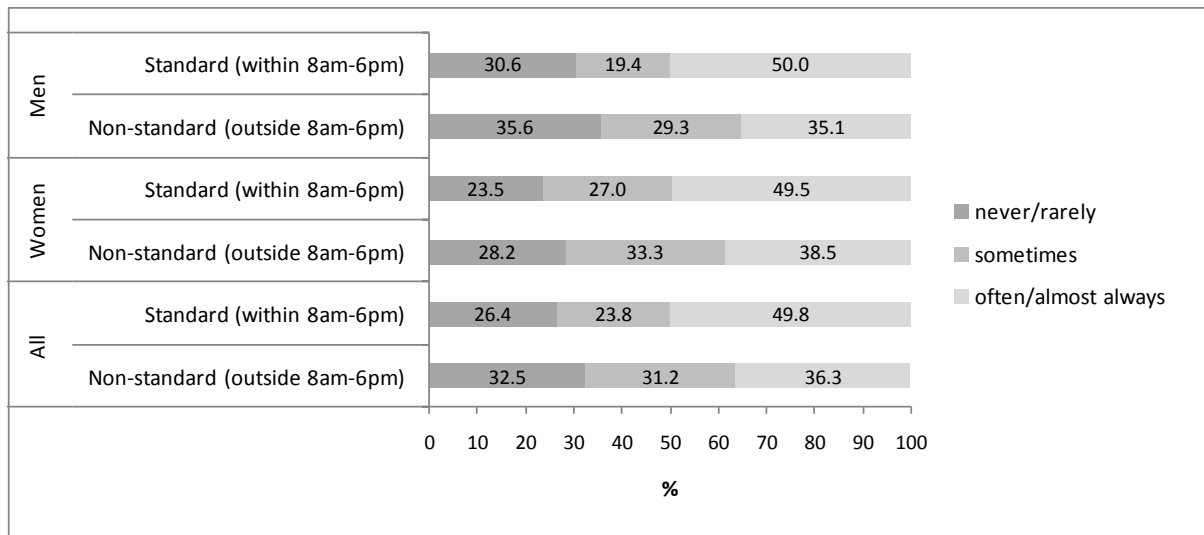


Figure 15 Frequency of having more than seven hours sleep, by work schedule and gender, per cent  
 Note. \*Estimate should be interpreted with caution due to small sample size.

Again, night work is most strongly associated with an increased risk of sleep issues (Figure 16). A substantial proportion, 45.1 per cent, of those on non-standard shifts that include night work never or rarely have sufficient sleep, compared to 26.4 per cent of those on other types of non-standard schedules or on standard schedules.

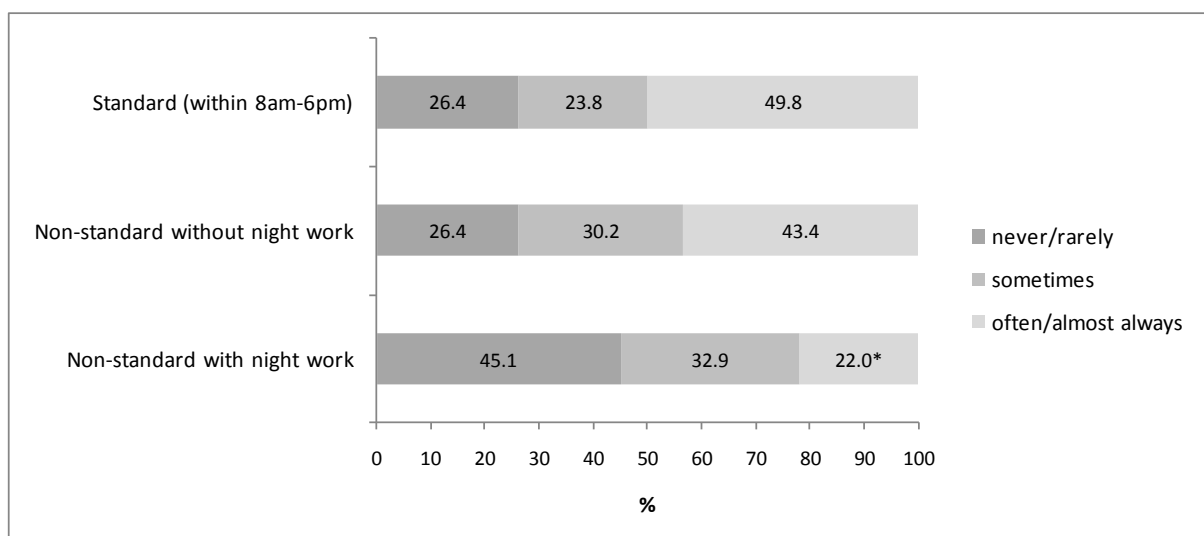


Figure 16 Frequency of having more than seven hours sleep, by night work, per cent  
 Note. \*Estimate should be interpreted with caution due to small sample size.

The contrasts between different types of scheduling are most evident for parents. Just over half of parents working night shifts (51.9 per cent) rarely, or never, have sufficient sleep, compared to

just over one-third of parents working other types of non-standard schedules (35.9 per cent) and around thirty per cent of parents working standard schedules (29.5 per cent).

### 4.3 Frequency of fatigue (extremely tired or completely exhausted)

There is also a clear association between work schedules and frequent feelings of fatigue. There are also important gender differences.

As Figure 17 shows, employees working non-standard schedules are more likely to report frequent fatigue (36.0 per cent) compared to those working standard schedules (27.5 per cent). There are gender differences in the pattern of fatigue across work schedules.

Frequent fatigue is rare for men working standard schedules (16.9 per cent).

A substantial proportion of women (35 to 40 per cent) report frequent fatigue, whether they are working standard or non-standard schedules. Regardless of whether they have children or not, women with standard work schedules are more likely to report frequent fatigue compared to men.

One third of men working non-standard schedules also experience frequent fatigue – a prevalence comparable to their female counterparts

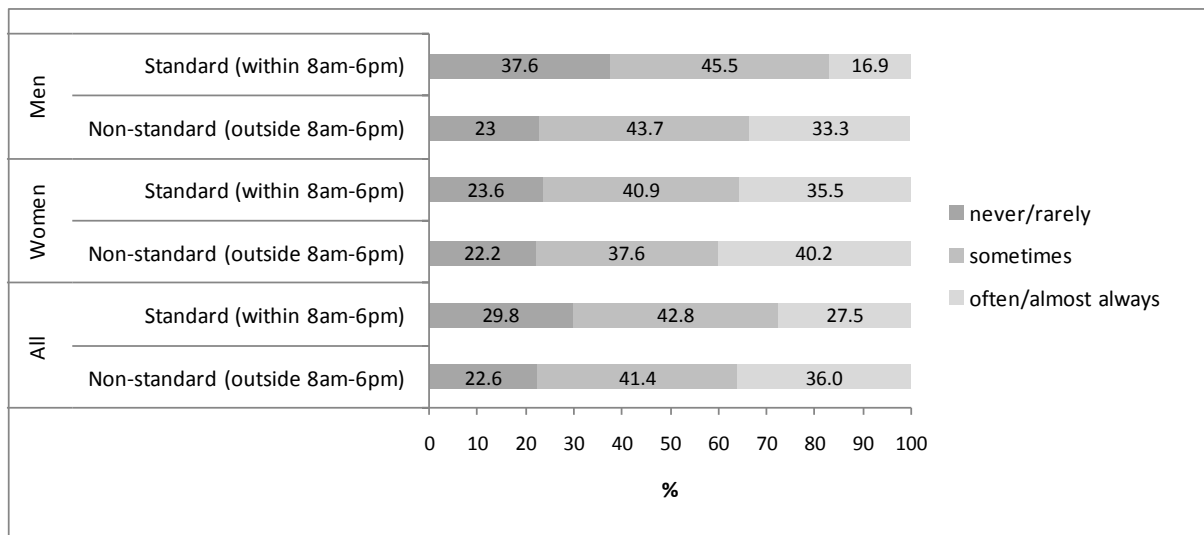


Figure 17 Frequency of fatigue, by work schedule and gender, per cent

Again we observe the strongest effects of work scheduling for parents. Nearly forty per cent (38.6) of parents working non-standard schedules report frequent fatigue, compared to 27.2 per cent of parents on standard schedules. In contrast, for those without children there is little difference in the likelihood of frequent fatigue between those on non-standard (33.8 per cent) compared to standard (27.5 per cent) schedules.

Nearly forty per cent (37.1) of mothers working a standard work schedule report frequent fatigue compared to only 17.5 per cent of fathers. This pattern is also evident within non-standard schedules, but the contrast was not as large and did not reach statistical significance (43.9 per cent of mothers and 35.2 per cent of fathers report frequent fatigue).

For those employees without children it is only with standard schedules that we see a significant gender difference: 34.9 per cent of women on standard work schedules report frequent fatigue compared to 16.4 per cent of men. There is no significant gender difference for those on non-standard schedules without children.

The association between fatigue and night shift work is less clear. The largest contrast in frequent fatigue is between those working non-standard schedules that do not involve night work (38.0 per cent) and those on standard schedules (27.5 per cent). Just over thirty per cent (31.7 per cent) of those doing night work report frequent fatigue.

At first glance it may appear that night work is less likely to result in frequent fatigue compared to other types non-standard schedules, however this effect most likely reflects the gender composition of these groups. Men, on average, are less likely to report frequent fatigue, and they also comprise the majority of night workers (73.2 per cent), whereas the gender balance is more even for other types of non-standard schedules (49.4 per cent men).

Parenthood is not associated with an increased likelihood of fatigue for those who do night work compared to other types of non-standard schedules.

**In sum**, a substantial proportion (35 to 40 per cent) of women report frequent fatigue, regardless of their work schedule. In contrast, it is only with non-standard schedules that men report a comparable prevalence of fatigue (33.3 per cent) to women. Frequent fatigue is rare for men working standard schedules. This suggests that, for men, working arrangements (scheduling, hours) are the strongest influence on fatigue. Whereas for women, whose levels of fatigue are moderate to high across work hours and schedules, other factors such as unpaid domestic and care workload may contribute more strongly to their fatigue.

## Section 5 Employment contract, occupation and self-employment

---

There is, of course, much more to the experience of employment than the number of hours worked. Here we examine three key employment characteristics: employment contract, occupation and self-employment, that are associated with significant differences in the experience of paid work. An industry analysis was not possible due to sample size restrictions.

Compared to other types of employment contract, casual work is less secure, more variable in hours and scheduling and more likely to lead to under-employment (preference to work more hours) (Pocock et al., 2010). The implications for sleep and fatigue of these variable and insecure work arrangements are not known. Work tasks, roles and responsibilities also differ significantly between occupations. There are also substantial differences between being self-employed compared to an employee. Self-employment may bring more autonomy and flexibility in the scheduling of work, but it also comes with more responsibilities and in many cases longer hours and less differentiation between work and non-work life (Pocock, et al., 2010; Taris, Geurts, Kompier, Lagerveld, & Blonk, 2008).

Here we examine whether each of these different employment characteristics has an impact on the risk of sleep issues and fatigue.

### *Type of employment contract*

Comparisons of different types of employment contract must be interpreted in the context of two important factors that co-vary with employment contract. Women are over-represented in casual work (67.9 per cent of casuals in SA are women). Casuals also work significantly fewer hours (22.6) compared to those on fixed term contracts (35.0) or on permanent/ongoing contracts (39.8).

Perhaps reflecting their shorter hours, casuals are more likely to report frequently having sufficient sleep (51.3 per cent) compared to those on permanent or fixed term contracts (combined) (43.8 per cent). There is no difference in work-related sleep restrictions between those on different types of employment contracts.

As observed previously, women are more likely to report frequent fatigue. Reflecting the predominance of women in the casual workforce, casual workers are more likely to report frequent fatigue (35.0 per cent) compared to those on permanent or fixed term contracts (29.4 per cent).

When we compare women on different employment contracts there is no difference in fatigue between women on casual compared to permanent/fixed term contracts. However, women working casually are more likely to report that they never or rarely experience fatigue (31.1 per cent) compared to women on permanent/fixed term contracts (20.6 per cent). This contrast may be due, to a large degree, to casuals' shorter work hours. A comparable pattern is evident when we consider women working part-time. The small number of full-time casuals restricts further analysis.

### *Occupation*

In the analysis of occupational differences, we compare those in managerial/professional occupations to other occupations. Sample size restrictions prevent analysis of specific occupations. Within each of these broad occupational groups there are equivalent proportions of men and women.

Work hours differ between occupations: those in managerial/professional occupations work longer hours (39.4) on average per week compared to other occupations (34.7).

Despite their shorter hours, workers in non-professional occupations are more likely to report that work frequently causes them to get less sleep than they need (16.7 per cent; 12.0 per cent of those in managerial/professional occupations). This most likely reflects the predominance of non-professionals workers in non-standard work (79.0 per cent of workers on non-standard schedules outside 8 am to 6 pm are in non-professional occupations).

There are no statistically significant differences between these two broad occupational groups on the frequency of insufficient sleep (less than seven hours) or fatigue.

*Type of employment - employees and the self-employed*

There is no indication that the frequency of fatigue and sleep issues differs between employees and the self-employed. The small number of self-employed persons in the sample (n = 114) prevents in-depth analysis of this group.

**In sum**, there is very little difference in the frequency of sleep issues or fatigue by type of employment contract, occupation or type of employment. Differences that are observed between these work arrangements are due rather to underlying patterns of work hours and scheduling, than the employment arrangement per se.

## Section 6 Causes and consequences of sleep issues and fatigue. What do workers think?

In this section we describe workers' views on the specific aspects of work that cause them to have less sleep than they need, and the perceived consequences of their experience of fatigue.

These two questions were only asked of respondents who had reported that work sometimes, often or almost always caused sleep restrictions (had less sleep than they needed), or who reported that they sometimes, often or almost always, felt fatigued (extremely tired or completely exhausted).

### 6.1 Aspects of work perceived to cause sleep restrictions

A substantial proportion, 39.1 per cent, of employees report that work sometimes, often or almost always causes them to have less sleep than they need, an experience more common for men (45.3 per cent) than women (35.2 per cent). These respondents were asked to identify which aspects of work impacted on their sleep from a list of alternatives. More than one factor could be identified.

Around half of employees identify long hours, or worrying about work, as causes of restricted sleep (Table 6). Just over 40 per cent attribute sleep restrictions to working overtime.

#### *Gender differences*

As observed previously, men are more likely to report that work causes sleep restrictions. They are also more likely to attribute this problem to long hours, which is consistent with their longer average hours in paid work. Women are more likely to identify worries or tension about work as impacting negatively on their sleep. These gender differences are evident for standard and non-standard schedules, but did not reach statistical significance for non-standard schedules.

Work worries or tension are particularly prominent for women as a cause of sleep restrictions: three quarters of women working on standard schedules attribute sleep restrictions to work worries compared to 46.3 per cent of men. A number of factors may account for these findings. Women are more likely to be engaged in service and caring work (e.g. health, aged care, education). The 'emotional labour' associated with providing care to others may make it difficult for many women to "switch off" from these demands when they are not at work. In general, women are more likely to express emotion compared to men, this gender difference may also extend to the reporting of work worries as impacting on sleep (Gross & John, 1995; Kring & Gordon, 1998).

Table 6 Aspects of work perceived to impact on sleep, by work schedule and gender, per cent

	Standard schedule (within 8 am to 6 pm)			Non-standard schedule (outside 8 am to 6 pm)			All		
	Men	Women	All	Men	Women	All	Men	Women	All
Long hours	58.8	40.0	48.4	54.5	43.3	50.3	56.4	40.9	49.3
Work worries or tension	46.3	74.1	61.8	40.2	52.9	44.8	42.8	64.7	52.9
Working overtime	53.7	42.4	47.4	38.9	37.3	38.3	44.2	40.3	42.4
Something else	17.9	22.4	20.9	19.5	36.8	25.6	19.3	28.6	23.6

#### *Parenting*

Parenting status does not have a clear association with the likelihood of sleep restrictions. There is also little difference in the perceived causes of sleep restrictions for those with or without children. Worries or tensions about work are more likely to be identified as a cause of sleep restrictions for those without children (57.6 per cent) compared to those with children (47.5 per

cent). This is only the case for women: sleep restrictions are attributed to work worries by 70.3 per cent of women without children, compared to 56.3 per cent of women with children. Parenting status has no effect men's attribution of work worries/tension as a cause of sleep restrictions.

### *Occupation*

There is only a small association between occupation and work-related sleep restrictions, with those in non-professional occupations slightly more likely to report frequent work-related sleep restrictions.

Those in managerial or professional occupations are particularly likely to attribute sleep restrictions to long hours (61.6 per cent) and worries or tensions about work (74.1 per cent), compared to those in other occupations (43.0 and 42.1 per cent, respectively).

Three quarters of men in professional occupational roles attribute their sleep restrictions to long hours, compared to around half of their female colleagues (51.6 per cent) and men in non-professional occupations (49.2 per cent). Only one-third of women in non-professional occupations attribute sleep restrictions to long hours.

Men and women in professional occupations are also likely to link sleep restrictions to worries or tensions about work (72.3 per cent of men; 75.0 per cent of women). The majority of women in non-professional occupations agree (57.3 per cent), whereas only thirty per cent of their male co-workers attribute sleep restrictions to work worries (31.8 per cent).

### *Comparing standard and non-standard schedules*

There is a clear and strong association between work scheduling and work-related sleep restrictions, with those on non-standard schedules much more likely to report sleep restrictions due to work.

Long hours are a consistent cause of sleep restrictions for those on standard schedules (48.4 per cent) or non-standard schedules (50.3 per cent).

Those on non-standard schedules are less likely to report working overtime and worries or tension about work as causes of sleep restrictions. Indeed, 61.8 per cent of those on standard schedules attribute their work-related sleep restrictions to worrying about work, compared to 44.8 per cent of those on non-standard schedules.

There are gender differences in these patterns. For women, work related worries or tensions are more likely to cause sleep problems in standard compared to non-standard schedules. For men, overtime is more likely to cause sleep restrictions in standard compared to non-standard schedules.

As expected, the way in which work is scheduled and arranged is the most common cause of work-related sleep restrictions for those on non-standard schedules.

For those on non-standard schedules, the most common causes of work-related sleep restrictions are working early mornings (60.2 per cent) and changing shifts that disrupt the body clock (47.8 per cent). The role of changing shifts in increasing the risk of fatigue and other negative outcomes is also highlighted in the SafeWork SA Code of Practice on Working Hours.

Considering only those working non-standard schedules, there is little difference between those who work night shifts and those who do not, with one exception. Those who work night shifts are less likely to report that work-related worries or tensions impact on their sleep (35.8 per cent; compared to 51.9 per cent of those who do not work night shifts). As observed previously, the majority of night workers are men (73.2 per cent), and men on average are less likely to attribute sleep restrictions to work-related worries. This gender effect most likely accounts for this observed difference.

**In sum**, long hours are perceived to be a common cause of sleep restrictions for workers on standard and non-standard schedules. This is particularly the case for men. Worries or tensions about work are a more common cause of sleep restrictions for those on standard schedules, and for women. As expected, issues related to the timing of shifts are a common cause of sleep restrictions for those on non-standard schedules.

## 6.2 Perceived consequences of fatigue

Frequent feelings of fatigue (often/almost always) are experienced by 30.4 per cent of employees. An additional 42.3 per cent sometimes feel tired/exhausted. These respondents were asked to identify which aspects of their life are affected by fatigue. Multiple responses were possible on this item.

Fatigue is commonly perceived to have negative consequences on a wide range of life domains (Table 7). For all employees the most common impacts of fatigue relate to life outside work, including mood at home (66.5 per cent), physical health (58.2 per cent), family life (58.1 per cent), hobbies and interests (57.6 per cent) and social life (57.1 per cent). Just over forty per cent also report their fatigue impacts on their mental health.

A substantial proportion of fatigued employees also identify negative impacts on work, including their productivity (46.5 per cent), job satisfaction (45.9 per cent) and quality of work (40.0 per cent). One quarter of employees report that fatigue affects their safety travelling to or from work, and 18.0 per cent are concerned for their safety at work.

Table 7 Aspects of life perceived to be affected by fatigue, by work hours and gender, per cent

	Standard schedule (within 8 am to 6 pm)			Non-standard schedule (outside 8 am to 6 pm)			All		
	Men	Women	All	Men	Women	All	Men	Women	All
<b>Personal domain</b>									
Mood at home	60.3	69.1	65.7	71.6	61.5	67.7	65.7	67.2	66.5
Physical health	48.7	59.3	55.3	62.2	64.8	63.3	55.1	60.9	58.2
Family life	55.6	56.0	55.8	65.2	57.1	61.9	60.1	56.4	58.1
Social life	53.0	57.2	55.6	62.2	56.0	60.0	57.5	56.7	57.1
Hobbies/interests	56.7	56.0	56.3	62.7	56.0	59.7	59.6	55.8	57.6
Mental health	41.1	48.4	45.7	38.1	42.9	39.8	39.9	46.9	43.6
<b>Work domain</b>									
Productivity	47.0	44.7	45.7	48.1	48.4	48.2	47.6	45.7	46.5
Job satisfaction	47.0	44.9	45.7	44.4	49.5	46.0	45.8	46.0	45.9
Quality of work	45.7	36.6	40.1	39.6	39.6	39.8	42.8	37.6	40.0
Safety travelling to/from work	28.5	23.0	25.1	30.4	33.0	31.4	29.4	25.7	27.4
Safety at work	16.0	14.4	15.0	24.4	22.0	23.5	19.9	16.4	18.0

### *Gender differences*

Women are more likely to report frequent fatigue compared to men. They are also more likely to report that fatigue affects their mental health (46.9 per cent) compared to men (39.9 per cent). There are no other significant gender differences on the perceived effects of fatigue.

### *Parenting*

There is little difference in the likelihood of fatigue between those with or without children. There is evidence, however, of different perceived effects of fatigue for these two groups. Parents of children aged under 18 years are more likely to experience negative effects of fatigue

on their non-work life. This most likely reflects the increased demands associated with managing both paid work and a household with children.

Employees with children are more likely to identify fatigue as affecting their family life, mood at home and personal hobbies and interests. There are no significant gender differences in these patterns, or between mothers and fathers in the perceived effects of fatigue.

It is interesting to observe that parents are *not* more likely to report detrimental effects of fatigue on their work productivity, quality or safety. Rather, it is their family and personal life that bears the negative impact of their fatigue.

Table 8 Aspects of life perceived to be affected by fatigue, by parenting status, per cent

	With children	No children	All
<b>Personal domain</b>			
Mood at home	73.4	60.5	66.5
Physical health	59.5	57.1	58.2
Family life	69.9	48.0	58.1
Social life	59.2	55.3	57.1
Hobbies/interests	63.7	52.1	57.6
Mental health	44.6	42.6	43.6
<b>Work domain</b>			
Productivity	46.9	46.2	46.5
Job satisfaction	48.6	43.5	45.9
Quality of work	40.5	39.6	40.0
Safety travelling to/from work	28.7	26.3	27.4
Safety at work	16.6	19.3	18.0

### *Occupation*

There is no difference between occupational groups on the frequency of fatigue, but there are differences in the perceived consequences.

Those in managerial or professional roles are more likely to report that feelings of fatigue affect their mental health (57.2 per cent; 38.3 per cent of non-professionals), social life (65.1 per cent and 54.1 per cent, respectively) and personal interests (64.7 per cent and 54.7 per cent, respectively).

Managerial and professional workers are also more likely than workers in other occupations to report effects on their work including productivity (58.4 per cent and 41.7 per cent, respectively), quality of work (50.3 per cent and 36.0 per cent, respectively) and job satisfaction (52.3 per cent and 43.0 per cent, respectively). There are no gender differences in these patterns.

### *Comparing standard and non-standard schedules*

Those working non-standard schedules are more likely to report frequent feelings of tiredness or fatigue. The scheduling of work also makes a difference to the perceived impact of fatigue.

Workers on non-standard schedules are more likely to perceive that their fatigue impacts on their physical health and safety (at work and travelling to/from work). Indeed, nearly one quarter (23.5 per cent) of workers on non-standard schedules are concerned about the impact of their fatigue on safety at work compared to 15.0 per cent of those on standard schedules.

The perceived impacts of fatigue are fairly consistent for men and women, although there are some differences.

For those working standard schedules, women are more likely to report that fatigue impacts on their physical and mental health, mood at home and social life. This gender difference was not evident for women on non-standard schedules.

Men working non-standard schedules are most likely to report that their fatigue impacts on their mood at home, compared to their female counterparts and those workers on non-standard schedules.

The only other significant gender difference is in relation to travelling to and from work. Women working standard schedules are *least* likely to report safety concerns about travelling to and from work compared to their male counterparts and workers on non-standard schedules. For those on standard schedules, this may reflect men's longer work hours, which result in more early morning or evening commutes to and from work.

Considering only workers on non-standard schedules, those whose schedules include night shift are more likely to report that their fatigue affects their mental health (81.5 per cent; 61.3 per cent of those not working night shifts). There are no other significant differences between these groups.

**In sum**, fatigue is commonly perceived to affect work, wellbeing and family life. For all employees, fatigue is more likely to affect their non-work, compared to work, functioning. Substantial proportions of employees also perceive negative effects of fatigue on their functioning at work, including safety and productivity. This is particularly the case for those on non-standard schedules.

## **Section 7 Work-life interference, work scheduling and sleep issues/fatigue**

So far we have examined how work hours and scheduling are associated with sleep issues and fatigue. Taking a work-life perspective we have investigated how particular socio-demographic characteristics such as gender and parenting responsibilities increase or decrease the risk of sleep issues and fatigue associated with long work hours or non-standard work schedules.

We now turn to examining work-life issues directly, by considering how work-life interference is associated with work hours and their scheduling.

It is well established that work-life interference increases with longer work hours, as evident in the contrast between part-time and full-time workers and also those working standard or longer full-time hours (Pocock, et al., 2010; Skinner & Pisaniello, 2010).

Here we examine how the length of work hours interacts with work scheduling, to examine whether longer work hours in non-standard schedules increases the likelihood of poor work-life outcomes.

Work-life interference was measured by the work-life index, a five-item measure of the extent to which work interferes with life outside work (activities, time with family/friends, community connections) and general feelings of time pressure and satisfaction with work-life balance. The index is scaled from 0 to 100, with higher scores indicating worse work-life interference. The average score is 42.3 for all respondents in the current sample (SA employees), which is equivalent to the national average (43.0).

The second aim in this section is to investigate the association between work-life interference and both sleep issues and fatigue. It is likely that this relationship is reciprocal: work-life strains and pressures are likely to increase fatigue and sleep issues, which in turn may contribute to difficulties in managing work and non-work commitments and responsibilities (Demerouti, et al., 2004). In this cross-sectional analysis we examine the magnitude of this association between these indicators of wellbeing.

### **7.1 Work hours, scheduling and work-life interference**

As Table 9 shows, for workers overall, work-life interference increases with longer work hours, with the largest (and statistically significant) increase evident between those working long full-time hours (45+) and those working standard full-time or part-time hours.

There is also a significant effect of work scheduling. Overall, work-life interference is highest for those working non-standard schedules.

#### *The interactive effects of work hours and scheduling for men and women*

When we consider the combination of the length and scheduling of work hours this difference between standard and non-standard schedules disappears for those working long hours (45+). In other words, working long hours (45+) has an equivalent negative effect on work-life interference regardless of whether these hours are worked on a standard or non-standard schedule.

#### *Gender differences*

There are significant gender differences in these patterns. In part-time and long full-time employment women have worse work-life interference than men, and this is evident for those on standard or non-standard schedules.

These findings most likely reflect gender difference in caring and domestic responsibilities outside the paid work sphere. Many women working part-time have very busy lives and are as time pressured as men working full-time (Higgins, et al., 2000; Pocock, et al., 2010; Walsh, 2007). There is evidence that reduced hours/part-time work may place some women at more risk of

role overload and work-life strains, as they are seen as a resource for school, home, family and community activities. When combined with paid work, these commitments and expectations create very busy lives for many women (Williams, et al., 2009). Such gender inequities may also account for the stronger effect of long hours (45+) on women's work-life interference.

A different pattern is evident for those working 35 to 44 full-time hours. On standard schedules between 8 am and 6 pm women report higher work-life interference than men. The opposite pattern is the case for non-standard schedules outside 8 am to 6 pm: men report higher work-life interference than women (when working 35 to 44 hours).

This latter finding is unexpected. It may reflect the higher proportion of men on non-standard schedules who also work nights, hence potentially increasing the difficulty of managing work and life commitments. On the other hand, the number of women in the sample working 35 to 44 hours on a non-standard schedule was small (< 50 persons), and this may affect the estimated work-life interference for this group. A larger sample size of women in this group may reveal a different pattern. Therefore, this finding should be interpreted with caution.

Table 9 Work-life interference (work-life index scores) by work hours, work schedule and gender

	Standard schedule	Non-standard schedule	All
1 - 34 hours			
Men	28.5	35.0*	30.3
Women	36.5	47.2	39.6
With children	40.2	51.2	43.6
No children	29.6	36.7	31.5
<b>All</b>	<b>35.1</b>	<b>45.0</b>	<b>37.9</b>
35 - 44 hours			
Men	35.3	46.1	39.4
Women	40.3	40.4	40.3
With children	39.2	51.8	43.6
No children	36.9	37.9	37.2
<b>All</b>	<b>37.8</b>	<b>44.4</b>	<b>39.8</b>
45+ hours			
Men	49.7	48.9	49.3
Women	58.9	57.1	58.3
With children	53.6	58.8	56.1
No children	52.3	43.1	48.1
<b>All</b>	<b>52.9</b>	<b>50.7</b>	<b>51.9</b>
All			
Men	38.9	46.5	42.0
Women	40.6	47.3	42.5
With children	42.7	54.0	46.7
No children	37.7	39.6	38.3
<b>All</b>	<b>40.0</b>	<b>46.8</b>	<b>42.3</b>

Note. \*Estimate should be interpreted with caution due to small sample size.

Among those working non-standard schedules two groups demonstrate a different pattern of work-life interference. Women working part-time on non-standard schedules report higher work-life interference than their full-time counterparts (and also part-time women on standard schedules). In full-time work there is no difference between women on standard or non-standard schedules regardless of their work hours.

To a large extent this most likely reflects an industry effect. The majority (66.1 per cent) of women working part-time non-standard schedules are in the retail trade (29.2 per cent) or health care and social assistance (36.9 per cent), two industries identified as high risks for work-life interference due to the interpersonal demands of service work (Pocock, et al., 2010). Working non-standard schedules (outside 8 am to 6 pm) is also likely to add to work-life strain in these industries.

Men working 35 to 44 full-time hours on non-standard schedules also represent an exception to the general pattern of findings. These men have higher work-life interference than their female counterparts whereas for all other groups men have equivalent or lower levels of work-life interference compared to women. These men also have higher work-life interference compared to men working 35 to 44 hours on a standard schedule (within 8 am to 6 pm). These men working non-standard schedules were predominately employed in manufacturing (31.6 per cent), health care and social assistance (13.9 per cent), construction (12.7 per cent) and retail trade (11.4 per cent). Again this finding may reflect, to a large extent, an industry effect. Construction and health care/social assistance are two industries identified as high risk for work-life interference (Pocock et al., 2010).

#### *The interactive effects of work hours and scheduling for parents*

It is well established that parenting responsibilities are likely to increase work-life strains and challenges. Similarly, it is clear from this study that parenting is associated with higher work-life interference:

- Within part-time work, parents report higher work-life interference than those without children, regardless of work schedule;
- The negative work-life impacts of long work hours (45+) and non-standard scheduling is greatest for workers with children;
- When the two strongest predictors of work-life interference, parenting and non-standard scheduling are combined, this is associated with the worse work-life interference.

It is also interesting to note that for full-time workers the difference between those with or without children is only observed for those working non-standard schedules.

There are gender differences in these patterns. For women working full-time (35 to 44 hours) on a standard schedule, work-life interference increases significantly with parenting responsibilities, whereas there is no significant difference for men. When hours increase to 45+, however, fathers do report worse work-life interference compared to men without children. There was not a sufficient sample of women working long hours to support further analysis.

## **7.2 Work-life interference and sleep issues/fatigue**

So far we have examined how the length and scheduling of work hours affect wellbeing, as assessed by work-life interference and both sleep issues and fatigue. Here we examine how these two aspects of wellbeing are related.

As Figure 18 shows, there is a clear association between an increasing frequency of work-related sleep restrictions (work causes less sleep than needed) and higher work-life interference. This is particularly the case for those with children aged under 18 years. The move from sometimes having work-related sleep restrictions to often or almost always experiencing this problem significantly increases parents' work-life interference, but does not affect the work-life interference of those without children. These patterns are evident for both men and women.

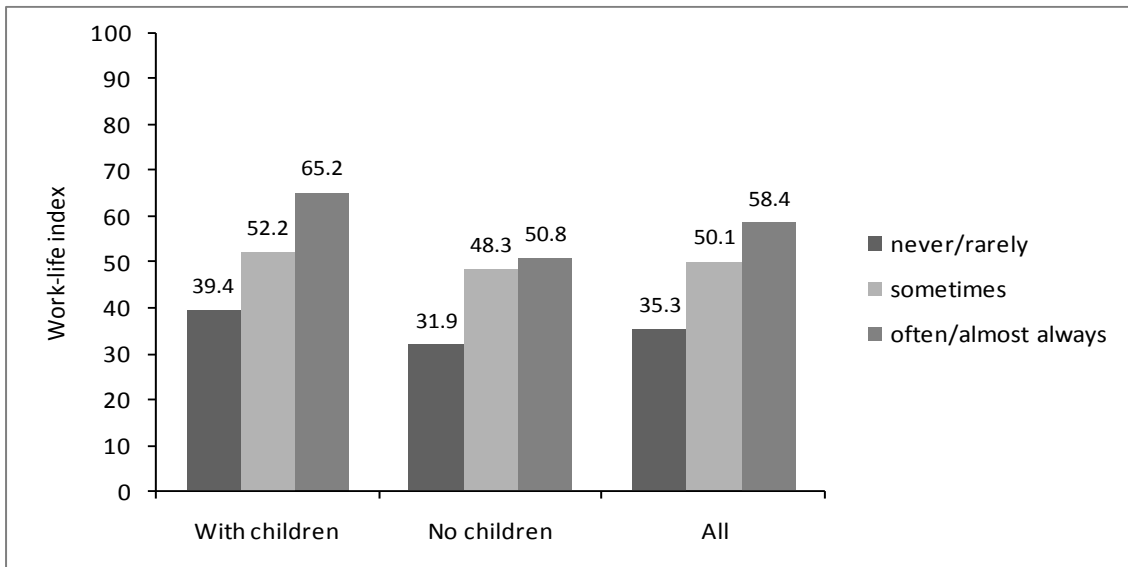


Figure 18 Work-life index scores by frequency that work causes less sleep than needed, with parenting status

A similar pattern is evident in the frequency with which employees have more than seven hours sleep a night. Figure 19 shows that those who frequently have sufficient sleep (7+ hours) also have the lowest work-life interference. Again there is evidence that parents' work-life outcomes have the strongest association with sleep issues. For those without children, there is little difference in work-life interference between those who never/rarely, or sometimes, have sufficient sleep. Whereas for parents, there is a clear, and statistically significant, work-life benefit (i.e. lower index score) associated with at least sometimes having sufficient sleep compared to never or rarely.

There is also a significant gender difference. Women's work-life interference worsens with each decrease in the frequency of sufficient sleep from often/almost always (37.3), sometimes (44.0) and rarely/never (50.7). Whereas for men, there is little difference in work-life interference between those who never/rarely (46.6) or sometimes (49.5) have sufficient sleep, with work-life interference only decreasing with frequently (often/almost always) having sufficient sleep (35.3).

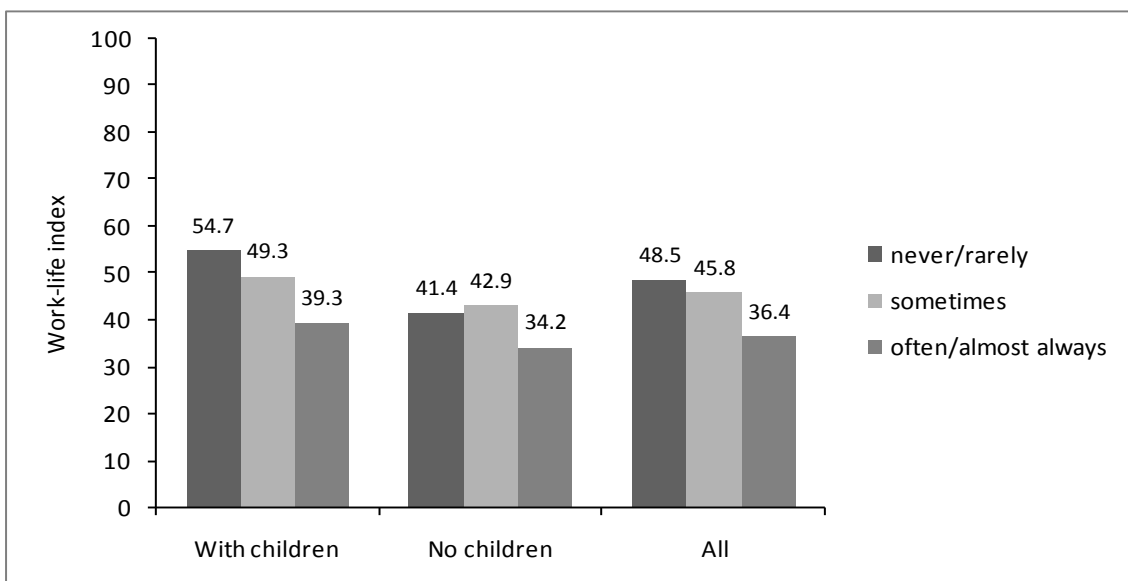


Figure 19 Work-life index scores by frequency of employees having more than seven hours of sleep, by parenting status

The work-life impacts of frequent fatigue are universal. As Figure 19 shows, work-life interference increases as the frequency of fatigue rises, and this is the case for those with or without children. There is also very little difference between men and women, regardless of parenting status.

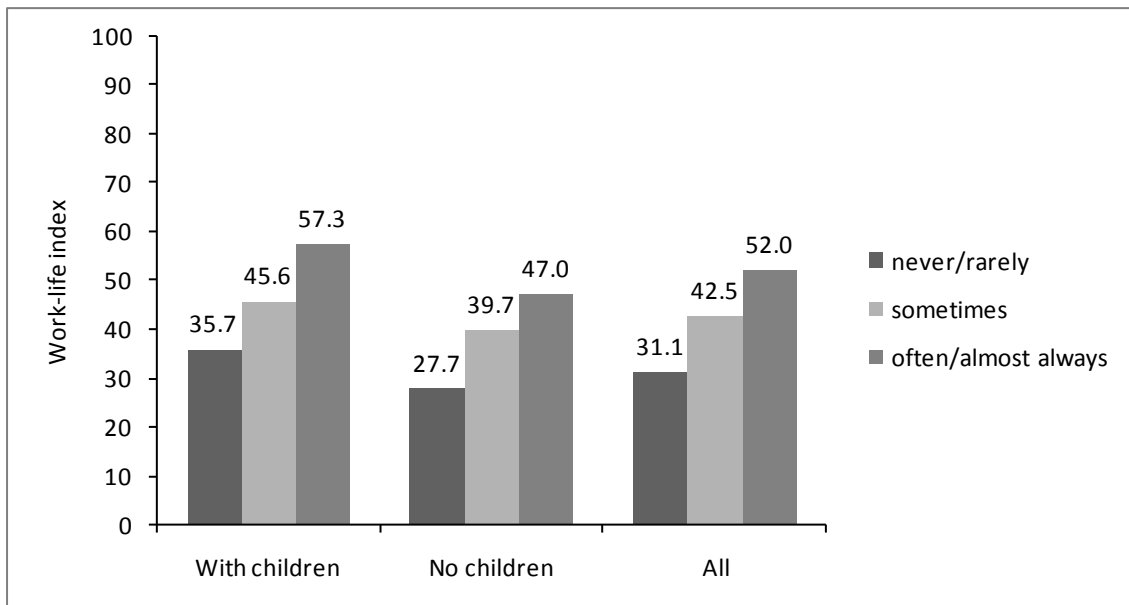


Figure 20 Work-life index scores by frequency of fatigue, with parenting status

**In sum**, there is a clear association between rising levels of work-life interference and an increasing frequency of sleep issues and fatigue. This association is particularly strong for parents, especially with regard to sleep issues. There is also evidence that women’s work-life interference is more sensitive to sleep restrictions. It is likely that a reciprocal effect underlies this association; more work-life strains may contribute to increase frequency of insufficient sleep, which in turn may make managing work and family/life commitments more challenging (Demerouti, et al., 2004).

## **Section 8 Fatigue and sleep issues across age groups**

So far we have identified three common risk factors for fatigue, sleep issues and work-life interference: (1) long hours (particularly 45+); (2) non-standard work scheduling (and night work in particular); and (3) parenting, particularly if paid work involves long hours or non-standard scheduling.

We have observed that men are more likely to work in work arrangements having these risk factors, which most likely accounts for the finding that, overall, men are more likely to report frequent work-related sleep restrictions and regularly having insufficient sleep. In contrast, women are more likely to report frequent fatigue.

In this section we take a different perspective by examining different age groups, with a particular focus on the age groups most likely to be employed in work arrangements with the greatest risk of fatigue, sleep issues and work-life interference.

We focus here on three age groups representing workers at the beginning (aged 20 to 29 years), middle (aged 30 to 44 years) and later (aged 45 to 64 years) stages of their engagement in paid work.

These three age groups broadly correspond with major life stages and differing work-life configurations. In the work domain those aged 20 to 29 years are developing their careers, those aged 30 to 44 are consolidating career paths and trajectories, while many older workers are moving into transition to retirement. Family dynamics and composition also differ across these age groups. For many there is a transition from pre-family formation, to family formation and early years of parenting, to parenting of young people and adults. There is evidence that for workers aged in their thirties and forties, the combination of peak periods of activity in work and family domains is particularly associated with work-life strains (Pocock et al., 2010). Here we examine the implications for sleep issues and fatigue.

### **8.1 Sleep issues and fatigue across age groups**

Overall, there is little difference in the frequency of sleep issues or fatigue across the three age groups (Table 10).

Younger workers (20 to 29 years) are less likely to report frequent fatigue (24.7 per cent) compared to those in the middle (33.1 per cent) and older (31.8 per cent) age groups, although this contrast was of borderline statistical significance.

Between 35 to 38 per cent of women across the three age groups report frequent fatigue. For men there is some indication that those aged 30 to 44 are most likely to report frequent fatigue (31.0 per cent) compared to younger men aged 20 to 29 (15.5 per cent) or older men (23.9 per cent), although this contrast was of borderline statistical significance.

There is additional evidence of men aged 30 to 44 being at higher risk of sleep issues and fatigue, compared to other men. For employees overall, men are more likely to report frequent work-related sleep restrictions and insufficient sleep. There is evidence that it is men aged 30 to 44 who are responsible for this gender difference, as this pattern is only evident for this age group.

Furthermore, it is only for those aged 30 to 44 that men report more frequent work-related sleep restrictions (22.5 per cent) compared to women (9.4 per cent). These men are also more likely to report never or rarely having sufficient sleep (7+ hours) (36.6 per cent) compared to women of the same age group (22.3 per cent). There are no statistically significant gender differences in the younger or older age groups.

Overall, women are more likely to report frequent fatigue compared to men. This pattern is evident in the younger and older age groups, but here is little difference in the prevalence of frequent fatigue for men (31.0 per cent) and women (35.3 per cent) aged 30 to 44 years.

Table 10 Likelihood of sleep/fatigue issues, long work hours and non-standard work scheduling, by age group and gender, per cent

	Men	Women	All
<b>20 to 29 years</b>			
Work frequently causes less sleep than needed	18.1*	16.2	17.2
Never/rarely have 7+ hours of sleep	27.7	17.8*	23.1
Frequently fatigued	15.5*	35.1	24.7
Work 45+ weekly hours	28.6	13.5*	21.5
With parenting responsibilities	**	**	31.6*
Without parenting responsibilities	**	**	33.3
Non-standard schedule – without night work	**	**	16.8
Non-standard schedule – with night work	**	**	13.4
<b>30 to 44 years</b>			
Work frequently causes less sleep than needed	22.5	9.4*	16.0
Never/rarely have 7+ hours of sleep	36.6	22.3	29.5
Frequently fatigued	31.0	35.3	33.1
Work 45+ hours	43.4	16.5	30.1
With parenting responsibilities	76.4	**	67.7
Without parenting responsibilities	23.6*	**	32.3
Non-standard schedule – without night work	16.3	17.2	16.7
Non-standard schedule – with night work	21.1	**	12.8
<b>45+ years</b>			
Work frequently causes less sleep than needed	17.4	13.9	15.5
Never/rarely have 7+ hours of sleep	36.8	28.9	32.5
Frequently fatigued	23.9	38.3	31.8
Work 45+ hours	42.2	14.7	27.2
With parenting responsibilities	40.2	**	33.3
Without parenting responsibilities	59.8	**	66.7
Non-standard schedule – without night work	24.8	19.2	21.7
Non-standard schedule – with night work	11.7	**	7.5

Note. Frequent = often/almost always. Fatigue = extremely tired/completely exhausted. \*Estimate should be interpreted with caution due to small sample size. \*\*Estimate not reported due to insufficient sample size.

## 8.2 Work hours and scheduling across age groups

A substantial proportion, just over 40 per cent, of men aged 30 to 44 (43.4 per cent) and older (42.2 per cent) work long hours (45+); over double the proportion of their female counterparts in each age group. In contrast, just over one quarter (28.6 per cent) of younger men aged 20 to 29 years work long hours, and very few women in this age group work long hours.

The majority (76.4 per cent) of men aged 30 to 44 years who work long hours also have parenting responsibilities, and a significant proportion, 40 per cent, of older men working long hours also have children under 18 years of age.

Men aged 30 years and above are most likely to work non-standard schedules. Night work is more common for men aged 30 to 44 years: one fifth work at night (21.1 per cent) compared to 11.7 per cent of older men.

## 8.3 Work-life interference across age groups

A different pattern is evident across the age groups for work-life interference. As Figure 21 shows, workers aged between 20 and 44 report the highest work-life interference. When we statistically control for differences in work hours (i.e. remove the effect of work hours on index scores), it is women aged 20 to 44 who report the highest work-life interference compared to men in their age group, and older women.

Those aged 20 to 44 are at a life stage where career/work engagement is often at its peak, and for many this is also the time for starting a family or parenting young children. This life stage, therefore, represents the convergence of peak activity in two highly valued life domains.

In each age group, women work shorter work hours than men, and this is particularly the case for those with parenting responsibilities. When the effect of their shorter hours is (statistically) removed, again we see the consistent pattern of higher work-life interference for women aged 20 to 44 years. Clearly, for these younger women, there is still a significant gender inequity in the ‘struggle to juggle’ work, family and personal life commitments.

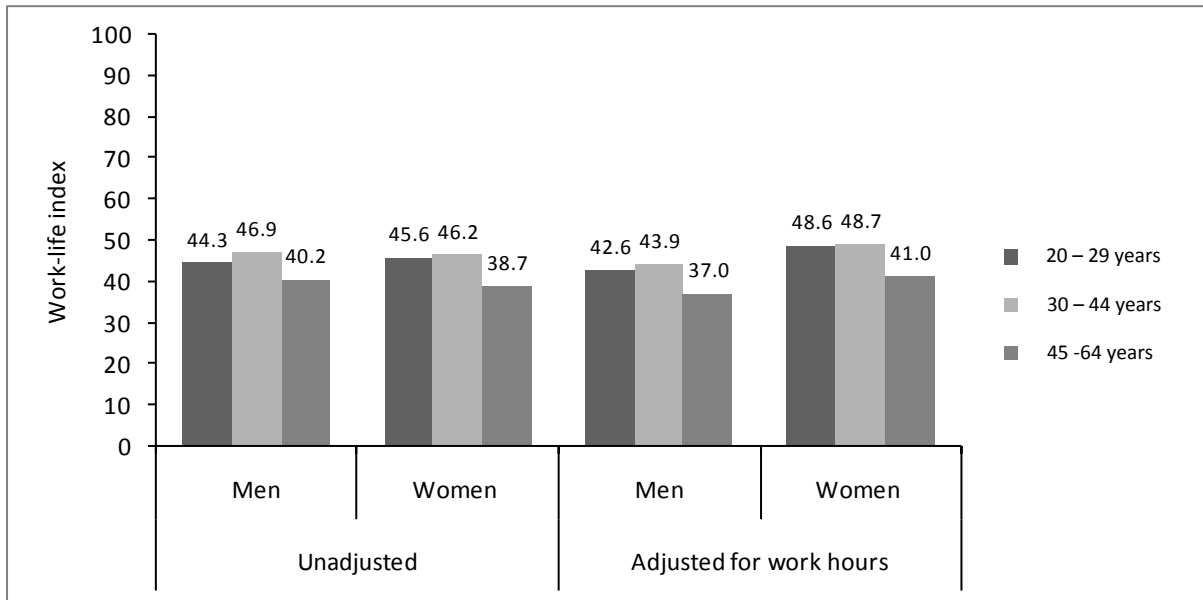


Figure 21 Work-life index scores by age group and gender, unadjusted and adjusted for work hours

**In sum**, men aged 30 to 44 are most likely to have work-life configurations that increase the risk of poor fatigue, sleep and work-life outcomes, specifically long hours (combined with parenting) and working non-standard schedules. Older men are not far behind on measures of sleep issues, but fatigue is not as prevalent for these older men compared to their counterparts aged 30 to 44 years. A slightly different pattern is evident when we consider work-life interference. Even though women aged 30 to 44 are less likely to be in work arrangements that produce work-life strains (long hours, non-standard schedules), they report equivalent levels of work-life interference to men of the same age. Indeed, when we statistically control for the effect of work hours, women aged between 20 to 44 report worse work-life interference than men of their age group. This most likely reflects gender inequities in unpaid care and domestic work, that significantly contribute to work-life strains for many women.

## Section 9 ‘FLAWS’: identifying those most at risk of *Fatigue, Work And Life Strain*

As the previous analysis has shown, sleep issues, fatigue and work-life interference are inter-related: work-life interference worsens with increasing frequency of sleep issues and fatigue. A reciprocal effect (Demerouti et al., 2001) is also likely, where work-life strains increase fatigue and sleep issues, which in turn make managing work and non-work responsibilities more difficult.

Both work-life interference and sleep issues/fatigue are associated with significant detriments to personal wellbeing and organisational outcomes. In this analysis we identify who comprises the highest risk group defined by both high work-life interference and frequent sleep issues *or* fatigue.

We use the term ‘FLAWS’ (**F**atigue, **L**ife **A**nd **W**ork **S**train) to refer to the combination of work-life interference and sleep issues/fatigue.

High fatigue/sleep issues are defined as scores above the median on *at least two of the scales* assessing work-related sleep restrictions, insufficient sleep or fatigue.

High work-life interference is defined as scores above the median on the work-life index.

As Table 11 shows, high FLAWS is defined as high work-life interference combined with frequent fatigue/sleep issues. Moderate FLAWS is defined as either high work-life interference *or* frequent fatigue/sleep issues. Low FLAWS is defined as low work-life interference and infrequent fatigue/sleep issues.

Table 11 Categorisation of high, moderate and low FLAWS

	High work-life interference	Low work-life interference
Frequent fatigue/sleep issues	High FLAWS	Moderate FLAWS
Infrequent fatigue/sleep issues	Moderate FLAWS	Low FLAWS

A multivariate ordinal logistic regression analysis was conducted to model the relationship between the level of FLAWS and a set of social and employment factors. The social factors were gender, age, parenting status, and the employment factors were work hours, work schedule, employment contract and occupation. This analysis enables us to identify the strongest predictors of FLAWS from within a set of possible factors

The factors that demonstrated a statistically significant association with FLAWS are described below.

Nearly one-third (29.0 per cent) of SA employees are in the high FLAWS group defined by both high work-life interference and frequent fatigue/sleep issues (Table 12). An additional one-third have moderate FLAWS reporting either frequent fatigue/sleep issues *or* high work-life interference.

Similar proportions of men (30.8 per cent) and women (27.3 per cent) are in the highest strain group. This is an interesting observation, given the significant gender differences in work hours and scheduling. One explanation is that the causes of FLAWS are likely to differ for men and women. As observed previously, men are more likely to work long full-time hours (45+) than women, and there is a clear relationship between very long hours and high FLAWS. Whilst women may spend less time, on average, in paid work, they spend more time on care and domestic work (Australian Bureau of Statistics, 2009; Craig, 2007; Craig & Mullan, 2009). Hence everyday life is busy and pressured for many working men and women. Although the

circumstances that create problems with work-life interference, sleep issues and fatigue may differ, the ultimate prevalence of high FLAWS for men and women is the same.

There are small differences in the prevalence of high FLAWS across age groups, but these are not statistically significant.

The challenge of combining paid work with parenting has been a consistent theme throughout this report. Here we see further evidence of this effect. Around one third (34.5 per cent) of parents have high FLAWS, compared to one quarter (24.4 per cent) of those without children.

As expected, longer work hours are associated with an increased risk of high FLAWS. Those in full-time work are more likely to have high FLAWS (32.2 per cent) compared to part-timers (22.4 per cent). Long full-time hours are associated with the highest risk of strain: 44.5 per cent, of long hours workers (45+) have high FLAWS compared to 24.7 per cent of those working 35 to 44 hours.

Working non-standard schedules (outside 8 am to 6 pm) also increases risk: 41.1 per cent of these workers have high FLAWS compared to 22.7 per cent of those on standard schedules. Working night shift is strongly associated with an increased risk of both work-life interference and sleep issues/fatigue – just over half of night workers (52.5 per cent) have high FLAWS.

Table 12 Proportion of employees with high, moderate and low FLAWS, per cent

	FLAWS		
	High	Moderate	Low
All employees	29.0	32.8	38.2
Men	30.8	31.8	37.4
Women	27.3	33.8	38.9
Generations			
Gen Y 20-29	30.0	31.6	38.4
Gen X 30-44	33.1	34.4	32.5
Baby Boomers 45-64	28.0	32.7	39.2
Parenting status			
Without children	24.4	33.2	42.4
With children	34.5	32.4	33.2
Work hours			
Full-time (all)	32.2	33.3	34.5
Full-time (35-44)	24.7	33.2	42.0
Full-time (45+)	44.5	33.5	22.0
Part-time (all)	22.4	31.8	45.8
Occupation			
Managers/Professionals	37.3	31.3	31.3
Other occupations	25.6	33.2	41.2
Employment contract			
Permanent/fixed term	31.2	32.8	35.9
Casual	18.9	32.8	48.3
Work schedule			
Standard	22.7	32.7	44.7
Non-standard	41.1	33.2	25.7
Non-standard no nights	33.5	32.9	33.5
Non-standard with nights	52.5	32.5	15.0*

\*Estimate should be interpreted with caution due to small sample size.

Other employment factors that increase the risk of high strain are working in a permanent or fixed term position. Working in a managerial or professional occupation is also associated with a greater risk of high FLAWS, although this contrast did not reach statistical significance.

**In sum**, when we consider who is most at risk of high FLAWS (high work-life interference *and* frequent fatigue/sleep issues), three factors consistently predict increased risk: long work hours, non-standard schedules and parenting responsibilities. Long work hours (45+) and night work place workers most at risk of high FLAWS.

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## Appendix (survey items)

1. How many hours per week do you usually spend in paid work, including any paid or unpaid overtime?
2. If you could choose the number of hours you work each week, and taking into account how that would affect your income, how many hours would you choose to work?
3. Thinking again about your work, what is your main occupation?
4. In what industry do you work?
5. Which one of the following best describes your current type of employment for your main job?
  - a) Permanent or ongoing
  - b) Fixed term contract
  - c) Casual
  - d) Self employed
  - e) Or, some other form
  
6. How often does your work interfere with your responsibilities or activities outside of work?
 

Never	Rarely	Sometimes	Often	Almost always
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7. How often does your work keep you from spending the amount of time you would like with family or friends?
 

Never	Rarely	Sometimes	Often	Almost always
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8. How often does your work interfere with your ability to develop or maintain connections and friendships in your community?
 

Never	Rarely	Sometimes	Often	Almost always
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9. Thinking about your life in general, how often do you feel rushed or pressed for time?
 

Never	Rarely	Sometimes	Often	Almost always
-------	--------	-----------	-------	---------------
  
10. And thinking about your life right now. Are you satisfied, not satisfied or neither satisfied nor dissatisfied, with the balance between your work and the rest of your life?
 

Not at all satisfied	Not very satisfied	Neither satisfied nor dissatisfied	Somewhat satisfied	Very satisfied
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11. Thinking now about your normal scheduled work hours. Do your normal scheduled hours fall within the hours of 8 am to 6 pm? (Yes/No)
12. (if NO to Q.11) And do you start work...
  - a) In the early morning, that is starting between 4am and 8am
  - b) During the morning, that is starting between 8am to 12 midday
  - c) In the afternoon, that is starting between 12 midday and 6 pm
  - d) At night, that is starting between 6 pm and 4 am
  - e) And are you ever on call  
(Multiple responses possible)
13. In your current employment, what is the usual length of your working day or shift in hours?
14. In your current employment, do you ever work between 10 pm at night and 6 am in the morning? (Yes/No)
15. In the last four weeks, how many hours in total have you worked between 10 pm and 6 am?
16. How often, if at all, do your work hours cause you to get less sleep than you need?
 

Never	Rarely	Sometimes	Often	Almost always
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17. (If sometimes, often or almost always to Q16) What is it about your work hours that has an impact on your sleep?
- a) Long hours
  - b) Worries or tension about work
  - c) Being on call
  - d) Working overtime
  - e) Night work
  - f) Working early mornings
  - g) Changing shifts disrupting your body clock
  - h) Something else
18. How often do you get more than 7 hours of sleep each night?
- |       |        |           |       |               |
|-------|--------|-----------|-------|---------------|
| Never | Rarely | Sometimes | Often | Almost always |
|-------|--------|-----------|-------|---------------|
19. How often do you feel extremely tired or completely exhausted? Would it be...?
- |       |        |           |       |               |
|-------|--------|-----------|-------|---------------|
| Never | Rarely | Sometimes | Often | Almost always |
|-------|--------|-----------|-------|---------------|
20. (If sometimes, often or almost always to Q16) And which of the following aspects of your life are affected by your feelings of tiredness or exhaustion?
- a) Your physical health
  - b) Your mental health
  - c) Your safety at work
  - d) Your safety travelling to or from work
  - e) Your family life
  - f) Your mood at home
  - g) Your productivity
  - h) Your quality of work
  - i) Your social life
  - j) Your job satisfaction
  - k) Your hobbies and personal interests