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# Managing Fatigue

## for Improved Workplace Safety



In this white paper, we explore the impact of fatigue on health, safety and performance, and what organisations can practically do to combat fatigue in the workplace. ▶

# Managing Fatigue for Improved Safety

***Fatigue is a problem that flies under the radar of most organisations.<sup>1</sup> Although not generally monitored, it impacts approximately 40% of employees.<sup>2</sup> Fatigue consists of physical (reduced resources after expending energy) and mental (perception of tiredness) components that operate together to reduce physical and psychological capabilities.<sup>3</sup> In short, fatigue is a depleted state that reduces an individual's capacity to function at his/her best ability.***

You'll probably be aware that fatigue is typically associated with a lack of proper sleep. Restorative activities such as sleep and rest tend to be the most effective in reducing fatigue<sup>4</sup>, making these essential for physical and mental human performance. Specifically, sleep is necessary to keep the brain alert; it fuels the brain's ability to organise thoughts and plan future behaviour.<sup>5</sup> Without adequate sleep, employees' mental capacities decline and their brains start consuming less energy, meaning they have fewer resources for performance.

What you may not know is that, by the time employees even notice that they are fatigued, their brains may have already begun to operate less efficiently (e.g. slower reaction times, reduced memory), resulting in decreased job performance. This is because our brain's experience of fatigue (e.g. slowed reaction time, overall brain function) rarely matches what we report as our level of fatigue—meaning people are generally very poor at assessing their own fatigue levels.<sup>6</sup> Coupled with the fact that most organisations don't track employee fatigue, fatigue can be wreaking havoc on employees' health and performance largely without organisational awareness of the problem.

In fact, very few organisations and industries consciously consider the role of employee fatigue within their company. Long haul truckers and airline pilots have restrictions placed on their work hours for safety concerns and only recently have limitations been implemented in the medical field, and not without help from a variety of political and cultural factors.<sup>7</sup>

Studies show that even moderate sleep deprivation can impair both cognitive and motor performance equivalent to a blood alcohol content of up to 0.1%.<sup>8,9</sup> No organisation would allow employees to work when under the influence of alcohol or other substances. Yet fatigue—which can lead to comparable impairments in performance and safety—often does not receive the same level of attention. The few companies who do have fatigue management policies in place typically stop at limiting work hours.

## Fatigue Affects Employee Performance

Of relevance to organisations, fatigue can manifest itself as increased absences, increased health conditions (e.g. digestive problems, colds and depression), and decreased productivity.<sup>10</sup> Fatigue is also associated with decreased memory, impacting performance over time, and also increases workplace accidents.<sup>11</sup> In the US, fatigue cost up to \$411 billion in 2015, which was equivalent to 2.28% of GDP. These costs are projected to rise over time, with estimates of up to \$433 billion by 2020 and \$456 billion by 2030.<sup>12</sup>



*Are you doing enough to reduce your employees' fatigue?*

## Thinking at Work

As alluded to previously, the main reason fatigue is detrimental to employee performance is the impact it has on cognitive functioning. By reducing the brain's resources and efficiency, fatigue impairs a person's ability to focus on current tasks, often resulting in fatigued employees taking longer to complete tasks than non-fatigued employees.<sup>13</sup> Not only is attention negatively impacted by fatigue, but so is decision-making. This adverse effect of fatigue stems from a fatigued person's reduced ability to integrate cognitive and emotional information needed to assess potential outcomes and the risks of different options.<sup>14</sup>

As compared to attention and focus, decision-making tends to have longer-term implications for performance, meaning that fatigue today can impact performance tomorrow. Similarly, research has found that fatigue impacts another longer-term cognitive process—learning.<sup>15</sup> Essentially, a fatigued person's reduced ability to effectively learn new knowledge and skills today may impact his/her performance later on when the learned information is needed and absent from memory.

Taken together, fatigue's negative effect on these different forms of cognitive functioning (i.e. focus, decision-making, learning) correspond with decreased productivity and efficiency at work.

## Attending Work

In addition to impacting employees' performance at work, fatigue affects employees' likelihood of being present at work at all. Fatigued employees are more likely to be tardy or miss work entirely than individuals that are not fatigued. And this finding does not take into account illness-based absences that may originate from fatigue.<sup>10</sup> Even more interesting is the fact that fatigue can impact long-term absences as well. For example, fatigue reported by employees now can lead to more absences by these employee 90 days later, or even longer into the future.<sup>16</sup>

## Staying Safe at Work

Fatigue has a detrimental effect on driving, with its impact similar to that associated with drinking and driving.<sup>9</sup> In fact, even amongst professional drivers, fatigue still accounts for as many as 40% of vehicle accidents.<sup>17</sup> Beyond driving incidents, which can impact employees both on- and off-the-job, fatigue impacts workplace safety in other ways. For example, fatigued employees are more likely to suffer a workplace injury than those who do not experience fatigue.<sup>18</sup> In addition to an employee's own safety, employee fatigue can impact the safety of others, such as their patients.<sup>19</sup> For example, in one study, it was found that nurses who worked longer shifts (12 as opposed to 8 hours) and were presumed to be more fatigued, also had more patient-related work errors, such as conducting procedures incorrectly or recording the wrong information on the patient's chart.<sup>20</sup> These errors in turn endanger the health of patients.

## Being Healthy at Work

The relationship between fatigue and health is closely intertwined, as fatigue can negatively impact a person's health<sup>21,22</sup> and can also stem from poor health or illness.<sup>2</sup> Fatigue is associated with poorer mental health, musculoskeletal problems, chronic health conditions, higher BMIs in the overweight and obese categories, and greater dependence on sugar and smoking.<sup>12</sup>

Not only can fatigue cause poor health, but it can also exacerbate existing health problems.<sup>2</sup> In either case, fatigue-related health problems impact employee performance. For example, employee health complaints are associated with less engagement on work tasks and poorer performance.<sup>23</sup> Conversely, research is replete with examples of how employee health is positively related to proactivity, engagement<sup>24</sup> and creativity at work, as well as individual job performance<sup>25</sup> and team performance.<sup>26</sup>



## Fatigue is About More Than Just Sleep

Although fatigue is caused by inadequate sleep quantity and poor sleep quality, there are many workplace factors that also contribute to employees feeling fatigued.

Workplace factors can impact fatigue in several ways, such as by:

1. impacting off-work sleep quality, quantity and recovery, and
2. reducing cognitive resources, even for well-rested employees.

The key work factors impacting employee fatigue include shiftwork, job demands and job conditions.

## Working 'Odd' Hours

It is fairly intuitive that shiftwork would cause employees to feel fatigued. Consider that shiftwork requires employees to work against their natural circadian rhythms, making it more difficult for them to sleep during the time that they are off work.<sup>27,28</sup> Shiftwork also increases employees' perceptions of fatigue even when they have adequate rest, as certain cues, such as darkness, trigger biological processes that create feelings of fatigue and make one sleepy.<sup>27</sup> Given this, it is not surprising then that studies consistently show that shiftwork is associated with employee fatigue.<sup>28,29,30,31</sup>

## Working Too Hard or Under Challenging Circumstances

Job demands consist of a variety of factors, such as long work hours, time pressure and conflicting responsibilities, which make doing your job challenging. Long work hours, such as those that happen with overtime, can cause fatigue by reducing an employees' cognitive resources during work and their opportunity for recovery (fewer hours between shifts for rest) after work. With this increase in fatigue, employees who work longer shifts have increased risk of injury and decreased job performance when compared to employees who work shorter shifts.<sup>18,32</sup>

Other job demands, such as emotional demands (e.g. emotionally sensitive work, such as tending to sick people, or emotionally intensive work, such as being pleasant all the time to customers) and physical demands (e.g. physically intensive work such as lifting heavy objects all day) are also associated with increased fatigue.<sup>33</sup> Even the sheer quantity of work or the quick pace that the work needs to be completed has been shown to increase employee fatigue.<sup>4</sup>

In addition to the demands of the work itself, the social elements of the workplace can cause employee fatigue. For example, employees who experience conflict with their supervisors or coworkers are more likely to report fatigue than those who do not.<sup>33</sup> In addition, a lack of support from coworkers can be fatiguing to employees.<sup>4</sup> And never underestimate the social nature of meetings, with frequent daily meetings being shown to lead to increased feelings of fatigue at the end of the day.<sup>34</sup>

In addition to direct increases in employee fatigue, high job demands are connected with high job stress, which in turn negatively impacts sleep.<sup>35</sup> Through job stress, these job demands can impact not only next-day-functioning, but also ongoing cognitive resources. Sometimes the effect is strong enough that these resources cannot even be recovered over time through rest.

## Organisations Can Do Something About Employee Fatigue

Employee fatigue is a significant concern for organisations. It not only negatively impacts employee attendance, performance, engagement and wellbeing, but fatigue can also be triggered by job factors that are the responsibility of the organisation. Though it has been lamented that employee assistance programs and training often target nearly every wellbeing factor other than fatigue<sup>1</sup>, fortunately there are initiatives that organisations can implement to reduce the negative impact of employee fatigue. A variety of options exist for managing employee fatigue, so there is no reason not to begin improving fatigue in your organisation.

To set your organisation up for success, try to use multiple methods to target all levels from the top floor to the shop floor to establish changes that all areas of the organisation will truly own and buy into. Otherwise there is a risk that policies will be written that leaders don't support, or employees feel they can't implement.



### THREE WAYS TO TARGET EMPLOYEE FATIGUE

- Target jobs by adjusting work tasks and schedules to increase employees' perceptions of their job resources.
- Target employees by implementing training to increase employees' awareness and management of their own fatigue.
- Target the organisation itself by implementing effective policies and practices to manage employee fatigue.

### Targeting the Job

The nature of certain jobs in and of themselves can be a contributing factor to employee fatigue. On the upside, jobs can also be designed to incorporate resources known to offset the likelihood of fatigue. Such resources include social support from colleagues and autonomy.<sup>33</sup> In addition to reducing the likelihood of feeling fatigued at work, these resources can decrease the amount of rest and non-work activities needed to recover from work.<sup>4</sup> Along with these job resources having a direct mitigating effect on fatigue, they can also act as a buffer against the impact of job demands on fatigue. For example, employees with a high degree of autonomy at work are less likely to be fatigued by high job demands than employees with little autonomy at work.<sup>36</sup> To provide employees with these job resources, organisations may offer (1) more opportunities for social interaction or collaboration at work and (2) more control over how employees do their work.

### Targeting the Employee

In addition to implementing ways to make the work itself less fatiguing, interventions can target employees' knowledge about fatigue and skills to manage fatigue. Research has shown that providing employees with tools to help them better recognise their own fatigue can be effective in increasing their fatigue awareness and reducing their fatigue-related accidents.<sup>37</sup> Employees can also be trained to recognise fatigue in one another and thus support each other's fatigue management.

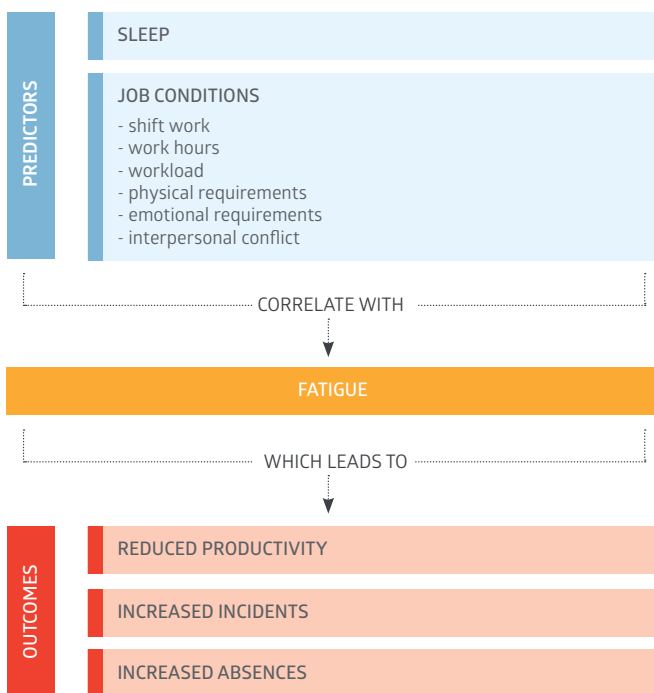
Beyond recognising fatigue, employees should be given tools to help them relax and rest well off the job. Strategies can include reading and stretching before bed, getting sufficient exercise and reducing caffeine intake, for example. At work, employees can be given pointers on managing fatigue in-the-moment. This training can include information on recommended fatigue management strategies (e.g. taking a short break) to supervised exercise programs. Such onsite exercise programs have been shown to reduce employee fatigue, even in shiftworkers.<sup>38</sup>

## Targeting the Organisation

In addition to providing employee training and increasing employees' job resources to reduce fatigue, management can implement organisational policies and practices that address the issue. Such policies may include limiting work hours<sup>39</sup>, reporting to your supervisor when tired or requiring breaks throughout the day.<sup>40</sup> Even better, management can encourage employee participation in creating fatigue management. Allowing this employee ownership has been shown to increase employee participation in the programs they help design.<sup>41</sup> The final policy should be distributed to all employees and supported by multiple modes of communication. This approach maximises the information employees receive.

Policies are most effective when coupled with leadership/management encouragement and support of the policies. In particular, leadership should be trained to encourage fatigue policy management use (e.g. encourage employees to make use of the policies in word and in deed). Leadership can also be trained on how to spot fatigued employees so that they may help recommend fatigue management and enforce fatigue management practices. In addition, consistent enforcement of organisational fatigue practices may facilitate a positive culture amongst employees of fatigue management (i.e. 'how we manage fatigue here') and in turn decrease employee fatigue.<sup>1</sup>

FIGURE 1. THE FATIGUE SCHEMATIC.



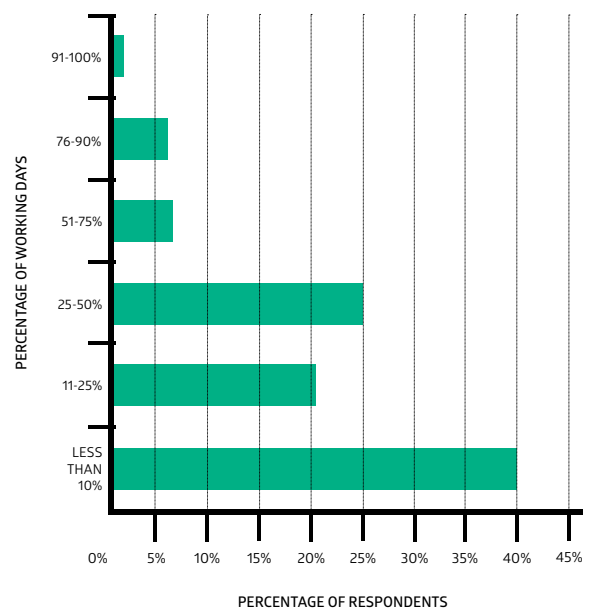
## Employee Fatigue is a Problem that Organisations Need to Tackle

Fatigue is not only a personal issue, but also an issue of organisational concern. Fatigue impacts employee performance both directly and indirectly through a variety of factors such as increased absences and decreased cognition. Although lack of sleep, generally considered an employee's personal issue that sits "outside of work" is a definite cause of fatigue, a variety of work factors (e.g. shiftwork, high workload) directly cause employees to feel fatigued and also impact how much and how well employees sleep. As such, fatigue is clearly an organisational issue; fortunately, it is an issue that organisations can influence. Through job and task design as well as training interventions, organisations can combat employee fatigue and avoid the estimated \$411 billion<sup>12</sup> in lost productivity associated with fatigue each year. It's time to get started.

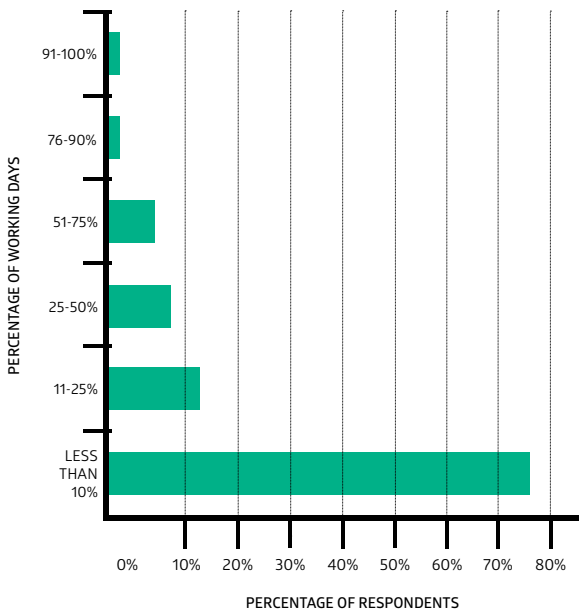
## Fatigue Study

In 2012, Sents sampled 226 employees from heavy industry (construction, aluminum smelting and underground coal mining) across Australia and the US to understand their level of fatigue, perceptions of fatigue management and personal fatigue management strategies. Results show that 15% of the sample had felt fatigued for half or more workdays in the past month (see Figure 2). Further, a shocking 25% of employees reported being so fatigued at work in the past month that they were unfit for duty for 11% of working days in the past month (see Figure 3). These 'unfit' and chronically fatigued employees were more likely to be involved in fatigue-related near misses and injuries than their well-rested counterparts.

FIGURE 2. PERCENTAGE OF RESPONDENTS REPORTING FATIGUE AT WORK.

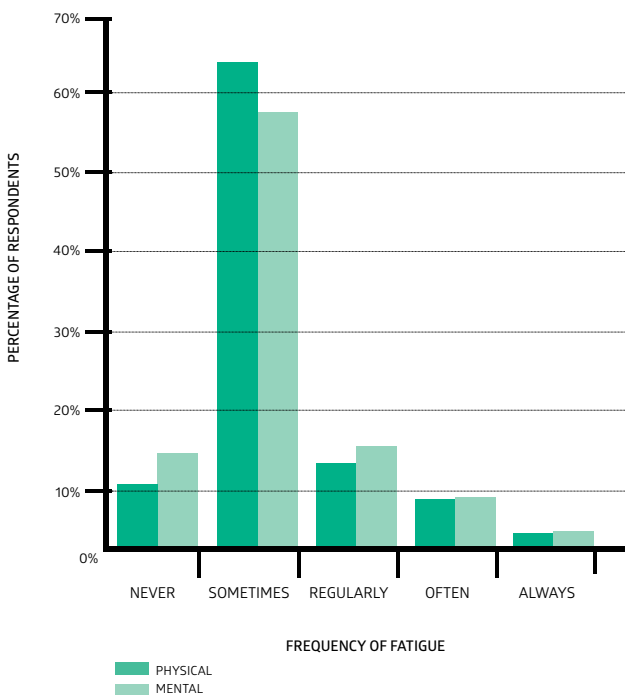


**FIGURE 3. PERCENTAGE OF RESPONDENTS FEELING FATIGUED TO THE EXTENT THEY WERE UNFIT FOR WORK.**



It's no surprise that the majority of respondents also reported feeling mentally and physically fatigued at least some of the time (see Figure 4).

**FIGURE 4. FREQUENCY OF MENTAL AND PHYSICAL FATIGUE FOR SURVEY RESPONDENTS.**

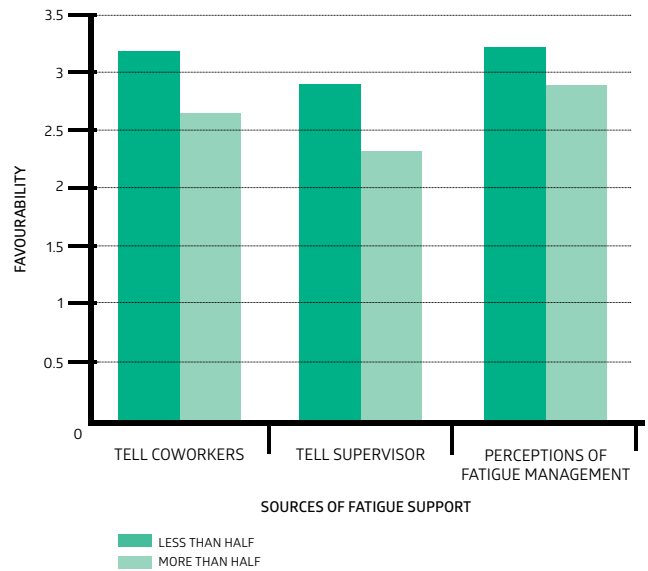


Unfortunately, while these fatigued employees recognise the impact of their fatigue on their performance (e.g. they are more likely than rested employees to note that sleep is critical for performance), they are less likely to seek help for their fatigue management. In particular, they are less likely to tell a coworker or supervisor they are fatigued and also

hold less favourable attitudes towards fatigue management policies (see Figure 5). The unfortunate catch-22 is that positive perceptions of fatigue management actually buffer against the impact of fatigue on performance (i.e. reduces near misses).

Specifically, employees who feel that their company recognises the impact of fatigue, encourages employees to use fatigue management practices and provides effective and clear policies, are less likely to be involved in a fatigue-related near miss. These employee perceptions point to the importance of not just having fatigue policies 'on the books' but having supportive management in place to encourage the use of these policies and practices.

**FIGURE 5. ATTITUDES TOWARDS SEEKING SOURCES OF FATIGUE SUPPORT FOR EMPLOYEES WHO CAME TO WORK FATIGUED LESS THAN HALF AND MORE THAN HALF OF THE DAYS LAST MONTH.**



Overall, our study highlights the prevalence of fatigue, as well as the impact of fatigue on employee performance (i.e. safety performance). The study also demonstrates the importance of organisational fatigue management and managerial support in buffering the impact of fatigue on employee performance.

Organisations can take action to combat fatigue and improve perception of fatigue management policies and management support by incorporating multiple methods at different levels (e.g. job, employee, organisation), to foster positive employee perceptions.

**Sentis specialises in safety culture measurement and transformation. Experts in applied psychology and neuroscience, Sentis helps organisations to enhance and move beyond compliance to empower employees to work safely—not because they have to, but because they want to. Offering training, coaching and consulting, Sentis has helped more than 300 companies and 150,000 people think differently about safety since 2003.**

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