

FINLAND'S MODEL FOR SUPPORTING MENTAL HEALTH THROUGH SHIFT SCHEDULING AND ERGONOMICS

Introduction

This case study examines the use of participatory shift scheduling and shift ergonomics in the health and social care (HeSCare) sector in Finland. Since 2015, the Titania participatory shift scheduling software has been used in several Finnish hospitals to enhance workers' involvement in scheduling their shifts, thereby promoting a better work–life balance and preventing stress and mental health issues stemming from work–life conflicts. To support the optimal use of the software in the Finnish public healthcare sector, the Finnish Institute of Occupational Health¹ (FIOH) has introduced a Traffic Light Model for Working Hours. This model provides specific recommendations for shift planners based on a series of studies conducted in the sector. The aim of these recommendations is to support the planning of working hours in a way that prevents stress caused by long or irregular working hours. In this context, the recommendations are utilised to improve shift ergonomics taking into account issues such as the length of working hours, the scheduling of working hours, breaks between shifts, work–life balance and influence of workers in choosing their schedule (FIOH, n.d.).

While there is no available evidence of a direct link between this tool and significant improvement in mental health and wellbeing, the tool has made irregular shift work more predictable and helped reduce stress caused by long working hours and insufficient breaks between shifts.

This case study presents the context of the intervention, highlighting the main psychosocial risks (PSRs) and negative health outcomes (including poor mental health) associated with irregular shift work. After describing the intervention, the case study presents the key research results that evaluate its effectiveness along with the main success factors and challenges encountered.

This case study is part of a research project² carried out with the aim to provide an overview of research on work-related PSRs and mental health-related outcomes in the HeSCare sector.

Methodology

The findings presented in this case study are based on a review of relevant research on participatory shift scheduling and shift ergonomics in Finland. The research projects examined the effects of participatory working time scheduling and the traffic light model on various aspects, including a) wellbeing (2020), b) sickness absence (2022), and c) occupational accidents (2022). These findings were summarised in a 2024 study titled 'The effects of ergonomic shift planning and the COVID-19 pandemic on working hours and health in the social and healthcare sector'. The studies were published in scientific journals and conducted in collaboration with researchers in the field, funded by the FIOH.

In addition to the literature review, this case study includes an interview with a deputy head nurse from Laakso Hospital in the City of Helsinki, who shared insights on the practical implementation of the recommendations. The interviewee is responsible for the shift planning of just over 20 nurses and has been using the Titania shift scheduling software along with the related ergonomics recommendations for three years.

Description of the intervention

Along with related research from the FIOH, this case study focuses on working time characteristics that could constitute PSRs in the HeSCare sector in Finland. These characteristics include the length of working hours, recovery time between shifts, opportunities to influence working time and patterns of sickness absence. Research has established connections between some of these working conditions

¹ More information available at: <https://www.ttl.fi/en>

² The full report is available at: <https://osha.europa.eu/en/publications/overview-work-related-psychosocial-risks-and-mental-health-outcomes-eu-health-and-social-care-sector>

and factors that can lead to mental health-related outcomes. For example, a cross-national study of Finnish and German healthcare employers studied associations between five working time-related dimensions with wellbeing, namely duration (weekly working hours), timing (shift work and weekend work), on-call work, working time autonomy, and work pressure (deadline and performance pressure). The study used data on working time dimensions and indicators of wellbeing (work–life conflict, poor perceived health, sleep difficulties and fatigue). As cited by the study, long working hours have been previously linked to physiological and psychological impairments in various outcomes including increased risk of shortened sleep, symptoms of depression, psychosomatic symptoms and work–life conflict. A low level of control over working time has also been linked to increased stress, poor perceived health and sleep disturbances (Ala-Mursula et al., 2020). The study itself also found that shift work, weekend work and low control over taking breaks showed some detrimental associations with the wellbeing outcomes for workers (Karhula et al., 2020).

Long or irregular working hours, such as shift work, are recognised as a major risk in the HeSCare sector (EU-OSHA, 2022) and can substantially affect employees' mental wellbeing and work–life balance (EU-OSHA, 2014; Turunen et al., 2022). Limited control over shift patterns and receiving shifts at short notice can complicate efforts to manage personal and social life around work, ultimately impacting work–life balance and potentially resulting in stress. Further, extended working hours, irregular shifts and last-minute schedule changes have been associated with fatigue, an increased risk of burnout (Franklin & Gkiouleka, 2021) and sleep disturbances (Eurofound, 2023). Therefore, the characteristics of working hours, especially when considered together, are crucial for understanding PSRs in the HeSCare sector.

In Finland, the Working Hours Act (872/2019), which came into force in 2020, introduced two key changes to how shift work is organised: one introduced a minimum of 11 hours of rest between shifts, and the other limited the number of consecutive shifts to a maximum of five (Eurostat, 2024). According to Eurostat data, in 2023, 21.9% of the Finnish population aged 16 to 65 worked shifts. Among women, this was even higher, at 25.6%. Both figures are above the EU average. Irregular shift work is particularly prevalent in the female-dominated HeSCare sector in the country. Consistent with European research, studies in Nordic countries, including Finland, have found a link between shift work and increased work–life imbalance, sleep disorders, sick leave, and various physical health issues (e.g. cardiovascular disorders, cerebrovascular disorders and breast cancer). The health problems and sickness absences most frequently observed were associated with consecutive night and evening shifts, intervals of less than 11 hours between shifts, long shifts exceeding 12 hours and limited opportunities to influence working hours (Härmä et al., 2024).

To prevent the negative impacts of shift work across all affected industries, the FIOH has developed a Traffic Light Model for Working Hours. This model recommends assessing workload and working hours, ensuring that critical shift characteristics (such as total working hours, shift lengths, consecutive shifts, evening and night shifts, recovery time, predictability, influence over schedules and breaks) are considered during shift planning. Since 2015, this model, along with the Titania shift scheduling software, has been implemented in the HeSCare sector in Finland.

What was done and how

According to the Traffic Light Model, shift planners, with the use of the Titania participatory shift scheduling software, are advised to consider five key factors when planning shifts for a period of two to six weeks:

1. length of working hours
2. scheduling of working hours
3. time for recovery
4. work–life balance
5. opportunities to influence working hours

Additionally, shift planners are encouraged to assess the predictability of working hours on a regular basis, such as once a year.

Each criterion is assessed using a scale of four different traffic light indicators:

- **Green:** Optimal load
- **Yellow:** Increased load

- **Orange:** Overload
- **Red:** Severe overload

According to the recommendations associated with the model, load estimation should be conducted in accordance with all five criteria, along with other work-related factors, including the physical and emotional workload associated with the specific profession (FIOH, n.d.).

Below is a summary of the main working hours features to consider when planning shifts.

Table 1: Summary of Traffic Light Model for Working Hours

Working hours feature	Recommendations	Indicators of severe overload
The time between two consecutive work shifts	At least 11 hours	More than 11 hours more than four times a month
Number of consecutive night shifts	Maximum 2	More than 4
Length of the rest period after night shifts	More than 48 hours	Less than 28 hours
Early morning shifts	Starts at 6.00 or later	Starting before 6.00 more than six times a month
Duration of the longest work shift	12-hour shifts maximum four times a week	More than 12-hour shifts more than four times a week 15-hours or longer shifts once a week
Consecutive shifts	3-5 shifts	More than 6 shifts

Source: FIOH (n.d.).

What was achieved?

The study focusing on the perceived wellbeing of healthcare workers in relation to the participatory shift scheduling tool showed a slight reduction in psychological stress at an individual level compared to those using traditional shift scheduling. The research involved 677 workers using the participatory scheduling software and 394 using traditional methods between 2015 and 2017. The wellbeing metrics assessed included sleep duration, sleep difficulties, psychological symptoms, perceived health and perceived work ability.

Although the study concluded that there was no statistically significant link between the application of shift ergonomics principles and perceived wellbeing — potentially due to the sample size of the study and notable differences in the use of the tool among the evaluated hospital districts — the research revealed that workers felt a greater sense of control over their shift schedules and reported reduced excessive sleepiness in connection with evening shifts (Karhula, Wöhrmann et al., 2020). While no direct relationship between the tool and shift ergonomics measures on wellbeing and work–life balance was established, increased control over scheduling and improved sleep hygiene are still valuable indicators of reduced PSRs as a result.

The positive effects of the model on stress reduction and healthier working shifts were further substantiated by a five-year follow-up study on the FIOH working hours recommendations. Implementing shift ergonomics principles in hospital districts nationwide contributed to decreased stress related to work schedules. Compared to those who did not use the inspection tool, regular corrections of shift ergonomics led to fewer short intervals between shifts, a reduction in the number of long and night shifts, and decreased consecutive shifts — all of which are known to pose health risks in shift work. Furthermore, the incidence of occupational accidents during working hours was nearly 20% lower among workers adhering to shift ergonomics principles (Härmä et al., 2022).

The deputy head nurse interviewed for this case study confirmed that using ergonomic shift planning principles following the national recommendations has had a clear positive impact on managing burnout, stress and tiredness resulting from shift work in her ward. In her own experience, in hospitals where the recommendation is not implemented strictly, workers tend to be more stressed, and sickness absence also tends to increase (Interview data).

Success factors

The key strength of the intervention lies in its research-backed approach. Since the implementation of the Titania software in 2015, the FIOH has engaged in multiple research projects related to working hours characteristics, which have guided the direction of future studies. Notably, the recommendations from the Traffic Light Model emerged from a series of studies, such as the Healthy Working Hours project, which aimed to create healthier shift arrangements for nurses working irregular hours. These studies focused on various aspects of shift scheduling and the impact of working hour characteristics on the mental and physical wellbeing of healthcare workers in Finland.

The studies examining the effects of ergonomic shift planning on working hours in the HeSCare sector in Finland utilised various longitudinal datasets. These datasets include information from the Social Security and Health Care Working Hours database, which spans the period from 2008 to 2022 and encompasses 23 hospital districts and social and health care units of Finnish cities (Härmä et al., 2024). The database contains data on daily working hours and sickness absence from 2015 to 2018 as well as survey data from the Local Government and Welfare Sector Monitoring Survey from 2011 to 2020. Across the different sub-studies, the data covered approximately 80,000 employees (Finnish Work Environment Fund, n.d.). This extensive data collection was facilitated by the Titania software, which captures daily working time data and information regarding the use of the shift planning programme. Consequently, the studies provided representative data to researchers and policymakers and could potentially influence related legislation, such as the new Working Hours Act, which introduced a minimum rest period of 11 hours between two consecutive shifts.

Challenges

One of the main challenges in implementing ergonomic shift recommendations is the lack of awareness among workers regarding the risks of irregular shift work on their mental and physical wellbeing (Interview data). While self-rostering may increase workers' perceived control over their shift schedules, it does not necessarily enhance their wellbeing (Karhula, Turunen, et al., 2020). In fact, it can lead to some potentially harmful characteristics of working hours, such as compressed shifts and longer hours, which are associated with an increase in sick leave (Turunen et al., 2022). Although the Traffic Light Model aims to mitigate risks caused by poor shift planning, workers often struggle to understand why their requests for self-rostering are rejected or altered (Interview data). This disconnect can result in a diminished sense of control over one's work arrangements, contributing to a greater work-life imbalance.

Another barrier to the widespread adoption of the Traffic Light Model could be the lack of commitment from certain hospitals and those responsible for shift planning. According to the most recent study on the initiative, while the recommendations of the Traffic Light Model are well known, shift planners only applied and corrected shift ergonomics according to the FIOH recommendations for 20% of workers in the dataset (Härmä et al., 2024). This observation aligns with the personal experience of the interviewee, who noted that not all hospitals rigorously uphold these recommendations at the leadership level, complicating the shift planners' ability to implement them (Interview data). Research professor Mikko Härmä emphasised that 'an organisation's commitment to work shift planning that supports occupational safety and health is essential' for the initiative's success (FIOH, 2022).

Key takeaways

Overall, studies on the Titania participatory shift scheduling tool and related shift ergonomics recommendations have found several indicators of healthier working shifts. These include a greater sense of control over and more predictability of workers' schedules, reduced excessive sleepiness in connection with evening shifts, and an overall reduced number of unhealthy shifts considering their length and intensity.

Although the study dedicated to researching the impact of shift ergonomics on wellbeing only found a slight reduction in psychological stress associated with the tool's use, the sub-results regarding working

hours characteristics and sickness absence indicate valuable benefits in implementing these principles in the HeSCare sector in relation to irregular shift work. Positive effects on healthier shift work were also confirmed by the interviewee, who shared her experience of using the ergonomic principles. In the future, to confirm the potentially positive effect of the tool on mental wellbeing, a longer follow-up and larger dataset would be necessary (Karhula, Wöhrmann et al., 2020). Nevertheless, the lessons learned from this intervention can be used to inform similar efforts in other countries to minimise the harmful risks from long and irregular working hours, including aspects of work–life balance, wellbeing and mental health.

The intervention's success in Finland was supported by extensive research and data collection facilitated by the Titania software, which provided representative data to researchers and policymakers since 2015. A similar approach could be replicated in other countries to help efforts to minimise the harmful risks from long and irregular working hours, including aspects of work–life balance, wellbeing and mental health. However, the transferability of the software and related regulations depends on both the willingness of relevant bodies to carry out research on working hours characteristics and their relation to occupational health and safety and on organisations to implement and uphold related recommendations. Should the shift planning tool and a traffic light system be implemented in another country, it would require extensive research on the characteristics of the working conditions and the most prevalent PSR factors among workers prior to putting the tool and related recommendations in place.

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Interview with a Deputy Head Nurse of Laakso Hospital, City of Helsinki. January 2025.

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