

The relationships between coping styles and food intake in shiftworking nurses and midwives: a pilot study

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Abstract: Shiftworkers are more likely to suffer from gastrointestinal disease and Type 2 Diabetes than the general population, likely due to their altered dietary intakes. Previous research has suggested that coping strategies and health behaviours may be linked, however, questions remain regarding these relationships in shiftworking populations. The Standard Shiftwork Index and Food Frequency Questionnaire were completed by nurses/midwives working forward rotating shifts (N=27, female=24, age=38.4 ± 13.1 y). Greater engaged coping strategy usage was associated with lower total energy, fat, carbohydrate and sugar intake ($p < 0.1$). Greater disengaged coping strategy usage was associated with greater intake of these nutrients ($p > 0.1$). Results suggest that engaged coping strategies may contribute to healthier dietary choices. A greater focus on coping styles, particularly during nursing education, may improve shiftworkers' health.

Key words: Nutrient intake, Shiftwork, Dietary behaviours, Coping strategies

Over 15% of Australia's workforce is engaged in shift-work¹, which presents several sleep and health related challenges for workers, including insufficient sleep, poor sleep quality, emotion regulation concerns, and increased stress². This is particularly relevant in the medical sector, as medical professionals are frequently making high-stakes decisions regarding patients' health. Nurses frequently work long and irregular hours in high stress environments, likely contributing to the high rates of burnout seen in nursing populations³.

To deal with the sleep and health related challenges that come with working irregular schedules, shiftworkers must adopt psychological coping methods. While many different coping strategies are available, a popular and meaningful way of categorizing these is into engaged and disengaged coping styles⁴. Engaged coping styles include seeking out solutions to problems and cognitive restructuring, while disengaged coping styles include wishful thinking and work disengagement. Engaged coping styles are considered healthier, as disengaged coping styles are related to lower perceived control over situations, which is associated with lower psychological wellbeing⁵. It is important to consider the coping strategies used by shiftworkers as research suggests that the consequences of stress are more

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likely to be related to the way a person copes with stressors, rather than a direct consequence of the stressor itself⁶⁾.

On top of these sleep-related challenges, shiftworkers experience a greater risk of Type 2 Diabetes and gastrointestinal disease and complaints than the general population⁷⁾. Some studies suggest that insufficient sleep and shiftwork are related to increased food consumption and poorer dietary intake⁸⁾, however, others suggest that shiftworkers and non-shiftworkers have similar dietary profiles, hence gastrointestinal issues are caused by altered timing of food consumption in those working “non-standard” hours⁹⁾. Regardless of the mechanisms behind these issues, food and beverage consumption may be an important coping mechanism in shiftwork given their alerting properties and the social aspect of sharing meals or snacks with co-workers.

While coping styles and their consequences for mental health have been investigated in shiftworking populations, their broader relationships with physical health have not been widely examined. Mental health may impact engagement in health behaviors¹⁰⁾, hence, investigating these broader relationships is relevant for improving health in these populations. For this reason, this study aimed to investigate the relationships between coping style and food consumption in shiftworkers.

This paper is part of a larger study that focused on understanding and communicating resilience in shiftworkers¹¹⁾. The study was approved by The University of South Australia Human Research Ethics Committee, and the ethics committees of the participating hospitals. All participants provided written informed consent. In this study, 130 participants completed the Standard Shiftwork Index (SSI), which measures demographics (age, shiftwork experience), and the use of coping strategies. Participants responded on a five-point scale (1=Not at all to 5=Used a great deal) to 32 items assessing the extent to which they use eight coping strategies to deal with issues in their social, work, and domestic lives, and sleep that are caused by working shifts¹²⁾. Four of the eight coping strategies are considered engaged, with the other four considered disengaged. This allowed for both an engaged and a disengaged score to be calculated for each participant, with a possible range 16–80 for each scale.

Participants had the option to also complete the Cancer Council Victoria Food Frequency Questionnaire (FFQ)¹³⁾. The FFQ asked participants to report how frequently and in what portions they had consumed foods over the previous 12 months. This was completed in order to give a daily dietary profile for each participant. While fifty nurses opted to complete the FFQ, complete SSI and FFQ data were re-

trieved for 27 participants. Therefore, the final sample consisted of 27 South Australian hospital nurses and midwives working forward rotating shifts (female=24, age=38.4 ± 13.1y).

Due to the non-normal distribution of data, Spearman's Rank Order Correlations were run to investigate the relationships between engaged coping scores and nutrient intakes and disengaged coping scores and nutrient intakes. Data were stratified by age in order to control for effects of age and length of time working shifts ($\rho=0.819$, $p<0.001$). A mean cut off was used, leading to analyses being run separately for those 38y and younger (N=15, M=28.2y ± 4.9) and those over 38 years (N=12, M=51.1y ± 7.5). Correlations <0.1 are not reported in text.

In this sample, the average engaged coping score was 45.0 (±11.2) and the average disengaged score was 35.3 (±12.5), indicating greater use of engaged versus disengaged coping strategies in this sample. The average engaged and disengaged coping scores for younger participants were 45.93 (±12.45) and 36.73 (±14.68), respectively. For older participants, these were 43.75 (±9.86) and 33.58 (±9.29). Average daily energy consumption was 6036.5Kj (±2001.6), total fat consumption was 61.8g (±21.1), saturated and polyunsaturated fat consumption were 25.2g (±8.8) and 8.7g (±4.8), respectively. Average protein consumption was 76.3g (±26.7), carbohydrate consumption was 146.7g (±54.0), sugar was 67.6g (±30.8), and cholesterol and sodium consumption were 298.2mg (±103.9) and 1954.1mg (±753.3), respectively. There were no significant differences between age groups and any nutrient intakes ($p>0.191$).

For those aged ≤38y, higher engaged coping scores were associated with lower daily intake of energy ($\rho=-0.202$), total fat ($\rho=-0.227$), saturated fat ($\rho=-0.395$), monounsaturated fat ($\rho=-0.163$), carbohydrates ($\rho=-0.102$), and cholesterol ($\rho=-0.273$) (see Fig. 1).

For those >38y, higher engaged coping scores were associated with lower daily intake of energy ($\rho=-0.344$), total fat ($\rho=-0.295$), saturated fat ($\rho=-0.341$), polyunsaturated fat ($\rho=-0.211$), protein ($\rho=-0.193$), carbohydrates ($\rho=-0.271$), and sugar ($\rho=-0.485$). Higher engaged coping scores were associated with higher daily cholesterol consumption ($\rho=0.130$).

For those aged ≤38y, higher disengaged coping scores were associated with higher daily intake of total fat ($\rho=0.331$), saturated fat ($\rho=0.382$), polyunsaturated fat ($\rho=0.322$), monounsaturated fat ($\rho=0.277$), protein ($\rho=0.490$), carbohydrate ($\rho=0.254$), sugar ($\rho=0.139$), cholesterol ($\rho=0.349$), and sodium ($\rho=0.581$) (see Fig. 2).

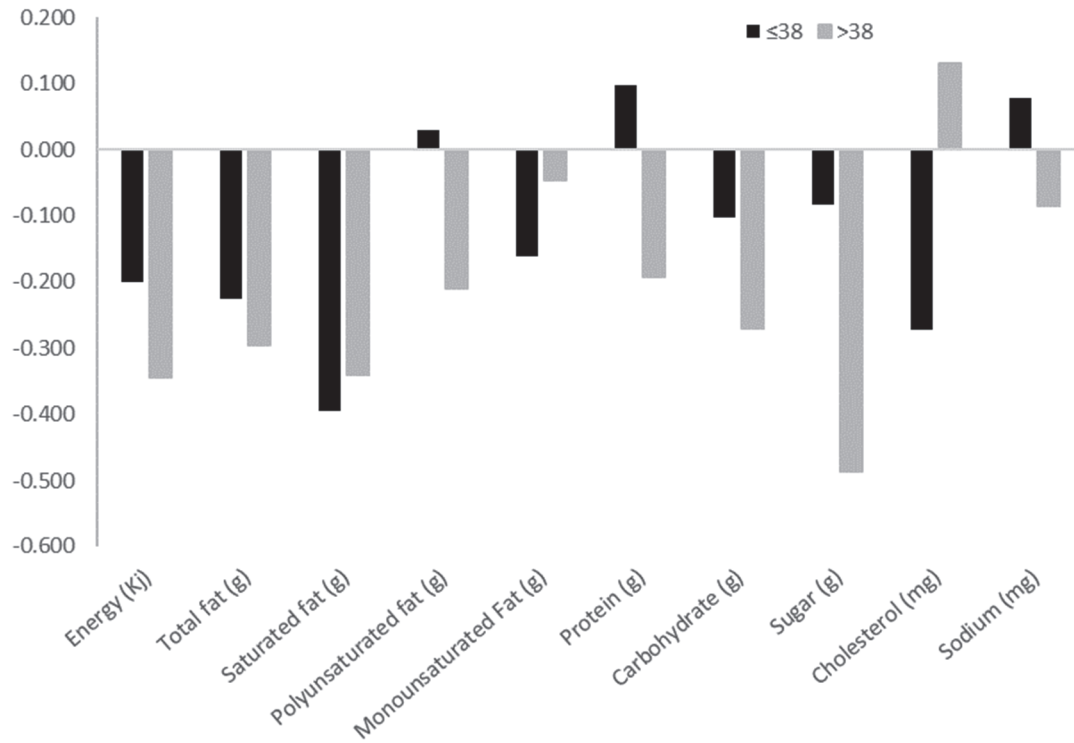


Fig. 1. Spearman's rank order correlations between engaged coping scores and nutrient intakes, stratified by age. Black bars represent participants aged 38 years and younger, while grey bars represent participants aged over 38 years. Bars above the axes are indicative of a positive relationship, while bars underneath the axes are indicative of a negative relationship.

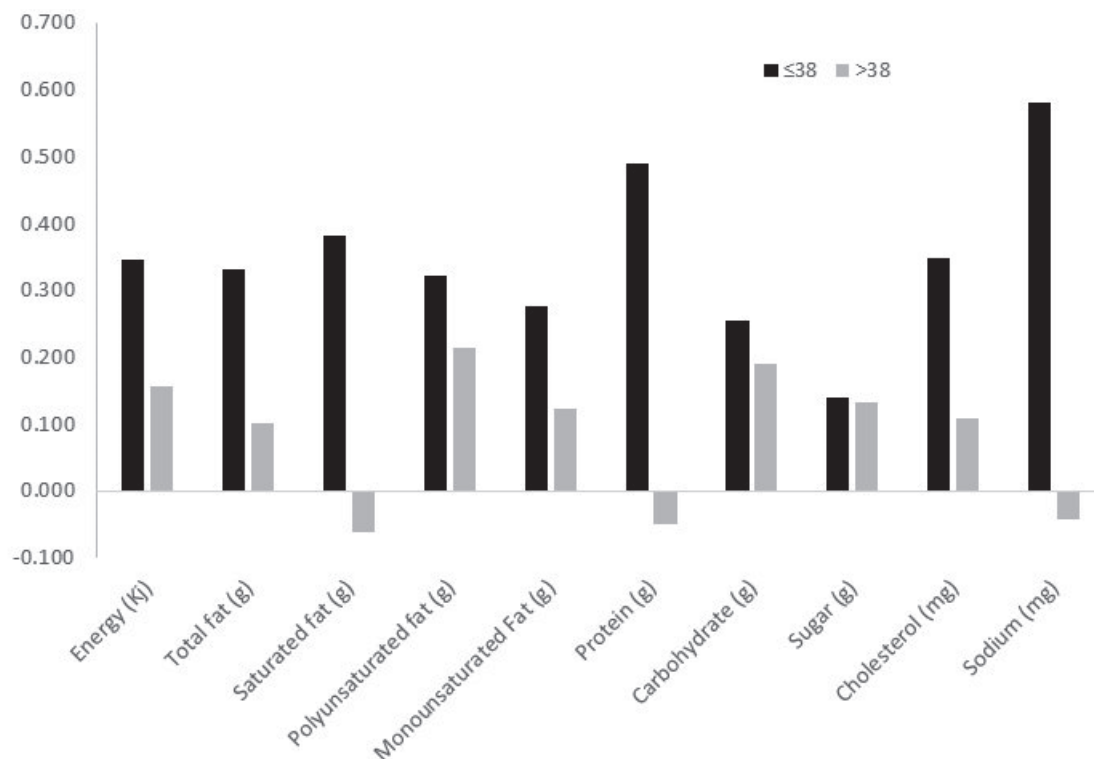


Fig. 2. Spearman's rank order correlations between disengaged coping scores and nutrient intakes, stratified by age. Black bars represent participants aged 38 years and younger, while grey bars represent participants aged over 38 years. Bars above the axes are indicative of a positive relationship, while bars underneath the axes are indicative of a negative relationship.

For those >38y, higher disengaged coping scores were associated with higher daily intake of energy ($\rho=0.158$), total fat ($\rho=0.102$), polyunsaturated fat ($\rho=0.214$), monounsaturated fat ($\rho=0.123$), carbohydrate ($\rho=0.189$), sugar ($\rho=0.133$), and cholesterol ($\rho=0.109$) (see Fig. 2).

Overall, shiftworking nurses and midwives consumed more total fat, saturated fat, protein, sugar, and sodium than the Australian recommendations¹⁴. There appears to be a relationship between coping styles and nutrient intake such that those who use more engaged coping styles are more likely to have healthier diets, while those who use more disengaged coping styles are more likely to have less healthy diets.

The finding regarding increased nutrient intake in our participants aligns with previous research that suggests shiftworkers are likely to have unhealthy diets⁸. In contrast, the relationship between coping mechanisms and nutrient intake is a novel finding in this population. While previous research has found that the use of more engaged coping styles is related to better mental health⁵, we believe that this study is one of the first to investigate the relationship between coping styles and health behaviors in shiftworkers. The age- or experience-related finding from this study is also novel. The relationships between disengaged coping styles and dietary intakes appear to be weaker for more experienced workers. Suggesting that as shiftworkers age or gain more experience with shiftwork, they become better able to manage their food intake in relation to stressors. An alternative explanation may be that individuals less able to manage their health or health behaviors in relation to shiftwork may opt out of roles that require working shifts, as suggested by the Healthy Worker Effect¹⁵.

Although a novel finding with the potential to improve both the mental and physical health of shiftworkers, this study is not without limitations. First, this is a small sample of nurses from two hospitals in South Australia. Access to food on shifts can impact workers' food choices¹⁶, and sampling from two hospitals may have limited the variation in food choices available. We recommend that this study be replicated in a larger sample size from several hospitals in order to assess whether access to food may impact the results. Second, the use of the FFQ is a limitation as asking participants to recall food consumed over the previous twelve months may introduce recall bias. Third, as this is a survey study, we are unable to conclude whether coping styles are impacting food choices or vice versa. Future studies may benefit from more directly asking nurses which factors influence their eating behaviors. Further, this sample used more engaged coping mechanisms, possibly due to

bias as more engaged shiftworkers may be more likely to volunteer to complete studies.

With these limitations in mind, this is one of the first studies to investigate the relationship between coping styles and nutrient intake in shiftworking nurses and midwives. These findings suggest that the use of more purposeful and engaged coping styles may not only improve the mental health of shiftworkers but that these improvements may extend to physical health. The inclusion of cognitive restructuring training or education around the use of coping styles in nursing training may assist in improving the mental and physical health of nurses once they enter the workforce.

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Disclosure of Interest

The authors report no conflict of interest.

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