

Assessing the Impact of Shift Work and Stress on the Psychological and Physiological Wellbeing of Police Officers

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ABSTRACT

The primary aim of this article is to assess the impact of a high stress shift work occupation (i.e., police work) on psychological (i.e., cognitive and somatic anxiety) and physiological (i.e., chronic fatigue, digestive and cardiovascular symptoms) wellbeing. Specifically, this study seeks to assess the impact of age on psychological and physiological wellbeing as well as to assess the mediating impact of adverse (disengagement) and beneficial (engagement) coping strategies on psychological and physiological wellbeing.

One hundred and twenty-nine subjects from two Police Local Area Commands in Eastern Australia completed a modified version of the Standard Shiftwork Index (SSI). It was hypothesized that age and disengagement coping would be adversely related to psychological and physiological symptoms and that, conversely, engagement coping would be beneficially related to psychological and physiological wellbeing. Although analysis of the data supported the hypothesis that age and disengagement coping were adversely related to a variety of psychological and physiological symptoms, the results did not support the hypothesis that engagement coping was beneficially related to either psychological or physiological wellbeing. These findings are discussed within the context their implications for police officer psychological and physiological wellbeing

To date, one of the most comprehensive questionnaire-based research tools used to assess the wellbeing of shift workers, and the many mediating factors impinging on shift worker wellbeing, is the Standard Shiftwork Index (SSI) designed by Barton, Spelten, Totterdell, Smith, Folkard & Costa (1995). Barton, Folkard, Smith, Spelten & Totterdell (1992) suggest that the SSI may be viewed as a set of previously standardized questionnaires that can be classified as fitting into one of two categories: (1) those examining variables that may mediate a response to shift work (e.g., age, marital status, shift system, personality variables and coping strategies) and, (2) those examining variables that measure the impact of shift work (e.g., sleep, psychological symptoms, and physical symptoms).

Previous research using the SSI indicates that age is positively correlated with a greater risk of developing a variety of psychological and physiological symptoms (Barton, et al., 1995a; Barton, et al., 1995; Costa, et al., 1995; Kaliterna & Prizmic, 1998; Ognianova & Dalbokova, 1998; Smith, et al., 2000; Tucker, et al., 1996) and increased sleep disturbance (Costa, et al., 1995; Ognianova & Dalbokova, 1998; Smith, et al., 2000). In contrast to this age-based research, several SSI studies provide mixed results regarding the influence of coping strategies on wellbeing. Coping is defined as any effort to prevent, eliminate, or reduce stressors, or to tolerate the effect of stress with minimum harm. It has been argued that, in the short term, our responses to stressors help mobilize energy resources, inhibit inflammation, and increase our resistance to infection. In the longer term chronic stress may be maladaptive to our wellbeing by eventually contributing to the development of a host of physical disorders as well as impeding our ability to mount an effective immune response (Bull, 1994). The use of negative or positive coping skills, therefore, can

significantly affect our ability to moderate harmful influences to our wellbeing.

The SSI assesses the impact of two primarily cognitively based coping strategies (i.e., engagement and disengagement) with regard to four problem areas (i.e., social and domestic life, sleep and job). Engagement coping assesses the extent to which subjects utilize the following positive coping strategies: talking to someone about problems, letting emotions out, working on solving problems and reorganizing problems so that they do not look so bad. In contrast, disengagement coping assesses the extent to which subject utilize the following negative coping strategies: spending more time alone, wishing the problem away, avoiding doing anything about the problem, avoiding thinking about the problem and self-criticism.

In order to test the above, Spelten, Smith, Totterdell, Barton, Folkard and Bohle (1993) tested a sample of 1532 nurses and midwives from England and Wales and assessed the impact of engagement and disengagement coping on psychological distress, as measured by the General Health Questionnaire (GHQ). The results indicated that the combination of low scores on both engagement and disengagement coping was associated with the lowest psychological distress scores. This result suggests that subjects who avoided utilizing both disengagement and engagement coping strategies reported more psychological wellbeing. Spelten, et al. (1993) concluded that while disengagement type coping may be more critical when problems are severe, engagement coping might be more critical when problems are moderate.

Utilising the same data from the Spelten, et al. (1993) study and an additional 332 industrial workers, Barton, et al. (1995) provided evidence that disengagement coping was adversely related with both psychological (i.e., psychological distress, cognitive and somatic anxiety) and physiological symptoms (i.e., chronic fatigue, digestive and cardiovascular symptoms) and sleep disturbance scores.

In a second publication using the data from the Spelten, et al. (1993) study, and an additional sample of 370 industrial workers, Smith, Spelten, Totterdell and Costa (1999) used a block recursive regression technique to assess the theoretical model of adaptation to shift work as proposed by Barton, et al. (1995). In brief, the path analysis of the industrial workers provided evidence that disengagement coping was associated with increased psychological distress and chronic fatigue, while engagement coping was found

to reduce psychological distress and chronic fatigue. Similarly, in the nursing sample, engagement coping was associated with decreased psychological distress and somatic anxiety, while disengagement was associated with increased psychological distress, chronic fatigue and somatic anxiety. Overall, these findings provide mixed evidence with regard to the beneficial or aversive role of both engagement and disengagement coping strategies on individual psychological and physiological wellbeing.

Unlike many shift work-based occupations, police officers work in a highly stressful environment in which officers have an increased chance of being physically and/or psychologically abused while working. Police officers also work in an environment that is based on a system with a high level of accountability. Due to these factors these employees can be classified as high risk shift workers. The myth that police officers are able to work under these stressful shift work conditions without any serious psychological or physiological symptoms is highlighted by Biggam, Power & Macdonald (1997, p.110) who note that police officers are portrayed in a stereotypical view that suggests officers are "a hardy individual who possesses somewhat superhuman coping skills and has the ability to address a multitude of potentially difficult situations".

Based on the premise that increased age and utilization of disengagement type coping is related to reduced wellbeing and that engagement and active coping is related to increased wellbeing, it is hypothesised that increasing age and disengagement coping will be adversely related to chronic fatigue, digestive and cardiovascular symptoms, cognitive and somatic anxiety, total sleep disturbances, and job satisfaction. It is also hypothesised that engagement coping and active coping will have a beneficial relationship with chronic fatigue, digestive and cardiovascular symptoms, cognitive and somatic anxiety, and job satisfaction.

METHOD

Subjects

The sample consisted of 129 (89 Male, 40 Female) police officers with an average age of 33.08 (SD= 8.13). The officers were based from two large Local Area Commands (LACs) on the coast of New South Wales, Australia. Of the 135 officers who took part in this study, 63 were from Site One and 66 were from Site Two. All officers worked a shift system that involved two AM, two PM 12-hour shifts, and then four days off in succession.

Materials

The SSI-P was modified to meet the requirements of the NSW Police Service. The SSI-P included both physiological (i.e., chronic fatigue, digestive and cardiovascular symptoms) and psychological (i.e., cognitive and somatic anxiety) wellbeing scores. The job satisfaction questionnaire and sleep disturbance questionnaire (modified for 2-shift instead of 3-shift system) from the SSI were also included in the SSI-P.

Procedure

Subjects were given a brief presentation outlining the aims and procedure of the study during a police-training day. On the same training day all subjects were given time to complete the SSI-P. All questionnaires were marked according to the standardized procedures (see Barton et al., 1992).

RESULTS

One hundred and twenty-nine subjects indicated that they had worked as a shift worker for an average of 15.26 years. The results of the current study will be differentiated by Age group (<25; 26-35; 36-45 and >46). For clarity of reporting the results, the terminology 'youngest', 'second youngest', 'second oldest' and 'oldest' age groups will be used. The data from the two LACs were combined as the initial data screening indicated that all the wellbeing scores between the two LACs were within one standard deviation of each other.

The oldest subjects reported higher psychological and physiological symptoms and total sleep disturbance scores in comparison to the younger age groups. In comparison to all younger subjects, the oldest subjects also reported the highest utilization of disengagement coping strategies and the lowest utilization of engagement coping strategies. In contrast, the youngest subjects reported the lowest chronic fatigue, cardiovascular, and somatic anxiety symptoms, and the highest job satisfaction scores. The second youngest subjects reported the lowest digestive, cognitive anxiety, job satisfaction and utilization of disengagement coping strategy (see Tables 1, 2, 3 and 4).

Table 2

Psychological Wellbeing Scores

| Age group: | Cognitive anxiety | | Somatic anxiety | |
|------------|-------------------|--------------|-----------------|--------------|
| | N | Score (SD) | N | Score (SD) |
| <25 | 23 | 15.26 (7.23) | 23 | 15.35 (5.56) |
| 26-35 | 69 | 14.87 (6.87) | 69 | 15.83 (5.62) |
| 36-45 | 22 | 17.59 (7.06) | 22 | 19.14 (5.24) |
| >46 | 15 | 20.53 (7.57) | 15 | 20.27 (6.32) |
| Total | 129 | 16.06 (7.22) | 129 | 16.82 (5.85) |

Table 3

Total Sleep Disturbance and Job Satisfaction Scores

| Age group: | Sleep disturbance (total) | | Job satisfaction | |
|------------|---------------------------|---------------|------------------|--------------|
| | N | Score (SD) | N | Score (SD) |
| <25 | 23 | 54.35 (10.96) | 23 | 22.91 (4.94) |
| 26-35 | 69 | 54.62 (9.95) | 69 | 19.96 (5.92) |
| 36-45 | 22 | 57.18 (8.15) | 22 | 20.65 (6.73) |
| >46 | 15 | 62.33 (8.34) | 15 | 21.00 (4.93) |
| Total | 129 | 55.91 (9.91) | 129 | 20.83 (5.86) |

Table 4

Coping Questionnaire Scores

| Age group: | Disengagement coping | | Engagement coping | |
|------------|----------------------|---------------|-------------------|---------------|
| | N | Score (SD) | N | Score (SD) |
| <25 | 23 | 38.00 (14.94) | 23 | 43.83 (10.66) |
| 26-35 | 69 | 34.99 (12.31) | 69 | 43.36 (11.47) |
| 36-45 | 22 | 35.59 (10.59) | 22 | 46.64 (10.19) |
| >46 | 15 | 41.87 (13.91) | 15 | 39.80 (8.89) |
| Total | 129 | 36.43 (12.79) | 129 | 43.59 (10.88) |

Before a Multiple Analysis of Covariance (MANCOVA) was performed to assess for the possible specific influence of age, disengagement and engagement coping on the SSI dependant variables, a series of Pearson's product-moment correlation co-efficient analyses were performed. Review of SSI dependant variables on age, disengagement and engagement coping indicated that age had a significant adverse (i.e., positive) relationship with chronic fatigue, digestive and cardiovascular symptoms, total sleep disturbance, cognitive and somatic anxiety, but not with disengagement or engagement coping, and job satisfaction.

Table 1

Physiological Wellbeing Scores

| Age group: | Chronic fatigue | | Digestive symptoms | | Cardiovascular symptoms | |
|------------|-----------------|--------------|--------------------|--------------|-------------------------|--------------|
| | N | Score (SD) | N | Score (SD) | N | Score (SD) |
| <25 | 23 | 29.04 (9.63) | 23 | 15.65 (4.47) | 23 | 10.78 (2.45) |
| 26-35 | 69 | 30.20 (7.13) | 69 | 15.17 (5.30) | 69 | 11.25 (3.31) |
| 36-45 | 22 | 32.68 (6.88) | 22 | 15.64 (3.00) | 22 | 14.55 (4.17) |
| >46 | 15 | 37.00 (9.55) | 15 | 19.93 (4.27) | 15 | 15.13 (4.45) |
| Total | 129 | 31.21 (8.15) | 129 | 15.89 (4.90) | 129 | 12.18 (3.83) |

Disengagement coping had a significant adverse (i.e., positive) relationship with all the physiological (i.e., chronic fatigue, digestive and cardiovascular symptoms) and psychological (i.e., cognitive and somatic anxiety) wellbeing scores. Disengagement coping was also found to have a significant adverse relationship with sleep disturbance and job satisfaction. Overall, engagement was found to be poorly related to the majority of the wellbeing measures. Engagement coping was only found to have a significant beneficial (i.e., negative) relationship with chronic fatigue (see Table 5).

The results from the MANCOVA provided evidence that while Age did not have a significant influence on job satisfaction and total sleep disturbance, it did have a significant impact on individual chronic fatigue, cardiovascular and digestive symptoms, cognitive and somatic anxiety. The covariate, Disengagement coping, was found to significantly influence all dependent variables: job satisfaction, sleep disturbance score, chronic fatigue, digestive and cardiovascular symptoms, cognitive and somatic anxiety.

DISCUSSION

Overall, the results of the current study support the first hypothesis. Review of the Pearson's product moment correlation matrices indicated that Age and Disengagement Coping had a significant aversive relationship with chronic fatigue, digestive and cardiovascular symptoms, cognitive and somatic anxiety, and sleep disturbance. In contrast, increasing Age (although not significantly) and Disengagement Coping were adversely related to job satisfaction.

In addition to the above, the MANCOVA provided evidence that the covariate Age had a significant adverse influence on the physiological wellbeing measures: chronic fatigue, digestive and cardiovascular symptoms, and two psychological wellbeing scores: cognitive anxiety and somatic anxiety. While Age was also found to have a significant adverse impact on sleep disturbance scores it did not have a significant affect on individual job satisfaction scores.

Based on the findings from the Pearson's correlation matrices and the MANCOVA, the results support the findings of previous research that increased age results in an increased severity of psychological and physiological symptoms (Barton, et al., 1995a; Barton, et al., 1995; Costa, et al., 1995; Kaliterna & Prizmic, 1998; Ognianova & Dalbokova, 1998; Smith, et al., 2000; Tucker, et al., 1996). In addition, supporting the previous research (Costa, et al., 1995; Ognianova & Dalbokova, 1998; and Smith, et al., 2000), was the finding that age had a significant adverse relationship with sleep disturbance scores.

Disengagement Coping, the covariate in the MANCOVA, was found to significantly influence all the physiological (i.e., chronic fatigue, cardiovascular and digestive symptoms), psychological (i.e., cognitive and somatic anxiety), job satisfaction and total sleep disturbance scores. Overall, the results of the MANCOVA and Pearson's correlation coefficients by Disengagement Coping support the previous research by Barton, et al. (1995) and Smith, et al.

Table 5
Pearson's Correlation Matrix of the SSI Dependant Variables by Age, Disengagement and Engagement Coping Strategies (N=129)

| | Age | Disengagement coping | Engagement coping |
|--------------------------|--------|----------------------|-------------------|
| Disengagement coping. | | | |
| Pearson (r) | .062 | | |
| Sig. | .486 | | |
| Engagement coping. | | | |
| Pearson (r) | -.079 | .079 | |
| Sig. | .375 | .376 | |
| Chronic fatigue. | | | |
| Pearson (r) | .317** | .416** | -.163 |
| Sig. | .000 | .000 | .065 |
| Digestive symptoms. | | | |
| Pearson (r) | .232** | .261** | -.121 |
| Sig. | .008 | .003 | .171 |
| Cardiovascular symptoms. | | | |
| Pearson (r) | .405** | .311** | -.051 |
| Sig. | .000 | .000 | .564 |
| Total sleep disturbance. | | | |
| Pearson (r) | .264** | .362** | -.158 |
| Sig. | .002 | .000 | .074 |
| Cognitive anxiety. | | | |
| Pearson (r) | .249** | .439** | -.051 |
| Sig. | .004 | .000 | .568 |
| Somatic anxiety. | | | |
| Pearson (r) | .286** | .408** | .075 |
| Sig. | .001 | .000 | .397 |
| Job satisfaction. | | | |
| Pearson (r) | -.111 | -.272** | .095 |
| Sig. | .209 | .002 | .283 |

Note. * significant at p<.05, ** significant at p<.01

Based on the correlation findings that Engagement coping failed to meet the assumptions of linearity and homogeneity of regression slopes, the proposed inclusion of the Engagement coping as covariates in the MANCOVA was abandoned. Based on the acceptance that the data met all the required assumptions, a series of MANCOVA's were performed using the SSI dependant variables (i.e., total sleep disturbance, chronic fatigue, cardiovascular and digestive symptoms, cognitive and somatic anxiety, job satisfaction) while accounting for two covariates: Age and Disengagement coping.

(1999) that the disengagement coping strategy is adversely related to total sleep disturbance, job satisfaction and psychological and physiological wellbeing.

The second hypothesis that Engagement Coping would have a beneficial relationship with physiological (i.e., chronic fatigue, cardiovascular and digestive symptoms), psychological (i.e., cognitive and somatic anxiety) symptoms, job satisfaction and total sleep disturbance scores was mostly unsupported. Engagement Coping was only found to have a significant beneficial relationship with chronic fatigue. Although not significant, the correlations provided evidence against the previous research by Barton, et al. (1995) that Engagement Coping would have a significant adverse relationship with digestive and cardiovascular symptoms and the Barton, et al. (1995) finding that engagement was adversely related to sleep disturbance.

As reported, Engagement Coping was found to be a poor indication of wellbeing. These findings are possibly due to several reasons. Firstly, the engagement questionnaire may have failed to assess the impact of active or behavioural type coping strategies (e.g., sleep hygiene strategies and regular exercise). Second, the coping questionnaire is scored by summing several coping behaviours into one overall score. Due to this, if a subject scores high on one or two questions and low on the others, then their total score may not reflect their actual utilization of specific types of coping strategies.

Clearly, subjects must use the most appropriate positive coping strategies that allow them to adapt to the aversive impact of shift work. It is important to note that while not all coping strategies will be effective in dealing with the adverse impact of shift work, some specific strategies may be beneficial (e.g., work on solving problems). Another important factor influencing the impact of the coping strategies may be age. The results of this study provide evidence that the oldest subjects were the most likely to use Disengagement Coping strategies, while also the least likely to use Engagement Coping strategies. This finding is interesting as, in theory, the oldest shift work are at the greatest risk of reduced psychological and physiological wellbeing and therefore the older shift workers should be the most active at reducing the utilization of active coping strategies and maximising the use of engagement type coping strategies. Further research is needed to assess the effect of age on coping strategy utilization.

In summary, the results of this study provide evidence that increasing age results in increased physiological and psychological symptoms. In addition, the negative coping strategy, Disengagement Coping, was adversely related to wellbeing. It is suggested that the combination of these factors – age and increased utilization of Disengagement Coping styles – may result in an increased risk of both physiological and psychological symptoms. Although not significant, the positive Engagement Coping strategy was beneficially related to the majority of the subjective wellbeing scores. These current findings indicate that further research is needed to assess the impact of the mediating role of specific positive and negative coping strategies on individual wellbeing.

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