Enhancing the Coping Skills of Submariners: An Evaluation of the Effectiveness of Skills Based Stress Management Training

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Declaration

I declare that this thesis is my own account of my research and contains as its main content work which has not previously been submitted for a degree at any tertiary educational institution.

Cindy McDougall

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CHAPTER 6

STUDY 2

6.0 Categorical Comparisons

6.1 Introduction

To obtain more specific information about the impact of work stress and submariners' coping abilities, further separate analyses by category were conducted. The comparisons chosen for statistical analysis were based on outcomes from Brown's (1999b) study, given previously reported similarities.

Junior Sailors have less control in terms of their job role and decision-making than Senior Sailors. Previous research suggests that this may result in stress being experienced. However, Officers and Senior Sailors tend to have greater responsibility in their roles. Brown (1999b) found that the senior rank groups gave the highest reports of stress and strain. Thus, Officers and Senior Sailors were compared with Junior Sailors on each of the variables. Findings may assist in identifying any need for specific training to be directed towards different rank groups, roles to be revised, and/or additional support or training provided. Coping resources utilised by different rank groups was also explored to better identify the strategies most effective in the submarine environment, and to aid in the selection process, as well as assist in preventative education.

'Job frustration' impacted on performance, mood, and all strain components in Brown's (1999b) study. The question of whether particular coping techniques buffer this variable was posed, and whether this issue was greater for those personnel who have a lesser degree of control over their work (i.e. Junior Sailors).

Separation from family and friends was found to impact on performance, coping and stress in Brown's (1999b) study. Therefore, personnel in relationships ('married' – married, recognised defacto, non recognised defacto) were compared to personnel not in relationships ('single' – single, divorced, widowed) to determine which sub group was more greatly impacted, and which types of coping strategies were employed to manage separation. This information can be used to provide more specific support to personnel and their families, and may also be useful in the recruitment process possibly in terms of including a Social Worker's assessment of the family situation, and linking them in with local support systems.

Based on her findings, Brown (1999b) hypothesised that longer exposure to the operational environment would further increase the impact on stress and strain. As the boats are now fully operational, the length of time served in the current posting was investigated against these areas to determine whether this has a negative impact on stress, strain, coping, job satisfaction, performance, or health issues.

6.2 Data Analysis

6.2.1 Category Comparisons

Nonparametric tests (Mann-Whitney U) were used to investigate the differences between the following demographic categories: Officers and Senior Sailors versus Junior Sailors; married versus single personnel. To reduce the likelihood of Type I errors, Bonferroni corrections were computed to adjust for multiple comparisons within categories. The findings for the pre-test information are presented in Table 17. For the demographic information collected at the initial testing point (i.e. years in

RAN, years in Submarine Service, months in current posting) the subsample group is n=75. For the remaining variables n=56.

Table 17

Rank and Marital Status Differences in Work Factors

Item	Junior Sailors Mean (*SD*)	Officers/ Senior Sailors Mean (*SD*)	Mann - Whitney U	Married Mean (*SD*)	Single Mean (*SD*)	Mann - Whitney U
Years in Navy	6.99 (3.51)	13.86 (4.21)	-5.74**	10.32 (5.63)	7.82 (3.53)	-1.78
Submarine Service Years	3.80 (3.78)	9.25 (5.17)	-4.30**	6.65 (5.64)	4.22 (3.63)	-1.57
Current Posting Months	14.21 (12.11)	11.66 (8.66)	-0.57	12.85 (11.30)	14.06 (11.05)	-0.64
Manpower/ Working Hours						
Current manning levels mean I don't get enough shore time to recover	3.38 (1.03)	3.94 (1.24)	-1.68	3.71 (1.16)	3.32 (1.03)	-1.29
We have enough personnel to ensure the job gets done properly	2.98 (1.05)	2.13 (0.88)	-2.69**	2.68 (1.08)	2.80 (1.08)	-0.45
I can't perform my job effectively due to current manning levels	2.65 (0.89)	3.38 (1.15)	-2.23*	3.03 (1.11)	2.64 (0.86)	-1.37
In general, I am happy with my current working hours	3.08 (1.07)	2.44 (0.96)	-1.99*	2.81 (1.08)	3.00 (1.08)	-0.59
I don't get to spend enough time with my family and friends	3.75 (0.93)	3.87 (1.15)	-0.65	3.71 (1.07)	3.88 (0.88)	-0.47
Constant changes to the work schedule make it difficult to plan family or leisure activities	4.05 (1.08)	4.31 (0.87)	-0.74	4.06 (1.18)	4.20 (0.81)	-0.09
Working alongside gives me a break in my workload	2.55 (1.11)	1.75 (0.93)	-2.61*	2.26 (1.06)	2.40 (1.19)	-0.37
Training & Preparation						
Prepared to meet operational requirements	3.25 (0.84)	3.19 (1.27)	-0.24	3.23 (1.12)	3.24 (0.78)	-0.04
Prepared for technical/specialist aspects	3.25 (0.90)	3.13 (1.02)	-0.54	3.19 (0.87)	3.24 (1.01)	-0.48
Prepared for lifestyle changes	2.98 (0.83)	3.12 (1.02)	-0.34	3.03 (1.01)	3.00 (0.71)	-0.09
Job Demands						
Mental and perceptual activity	3.75 (0.95)	4.56 (0.51)	-3.14**	4.16 (0.73)	3.76 (1.09)	-1.36
Physical activity	3.00 (0.90)	2.38 (0.96)	-2.16*	2.61 (0.95)	3.08 (0.91)	-1.58
Time pressure	3.40 (0.87)	4.06 (0.77)	-2.47*	3.65 (0.84)	3.52 (0.96)	-0.44
Hard work	3.53 (0.85)	4.31 (0.70)	-3.05**	3.74 (0.81)	3.76 (0.97)	-0.18
Frustrations on job	2.87 (1.11)	3.50 (0.96)	-2.05*	3.23 (0.95)	2.84 (1.25)	-1.33

(Table 17 continued on pp.97)

Item	Junior Sailors Mean (*SD*)	Officers/ Senior Sailors Mean (*SD*)	Mann - Whitney U	Married Mean (*SD*)	Single Mean (*SD*)	Mann - Whitney U
Submariner Views						
Crew works well as a team	4.03 (0.77)	3.75 (1.00)	-0.90	3.87 (0.88)	0.40 (0.79)	-0.71
COLLINS submariners perceived as elite	3.13 (1.11)	2.25 (0.85)	-2.83*	2.65 (1.25)	3.16 (0.85)	-1.67
Little teamwork & cooperation among crew	2.03 (0.83)	1.81 (0.91)	-1.04	2.00 (0.85)	1.92 (0.86)	-0.39
Closest relationships with people I work with	2.65 (1.03)	2.69 (1.08)	-0.07	2.55 (0.99)	2.80 (1.08)	-0.89
Negative media attention makes work less satisfying	2.87 (1.18)	3.44 (1.21)	-1.60	3.13 (1.28)	2.92 (1.11)	-0.65
Media attention on 'problems' blown out of proportion	3.97 (0.97)	3.88 (1.09)	-0.18	4.06 (0.93)	3.80 (1.08)	-0.99
Submarine doesn't meet safety requirements	2.72 (1.08)	2.75 (1.34)	-0.07	2.97 (1.22)	2.44 (1.00)	-1.65
No major safety concerns at sea	3.22 (1.07)	3.19 (1.56)	-0.05	3.10 (1.35)	3.36 (1.03)	-0.68
Work on submarine is mentally exhausting	3.48 (0.99)	4.31 (0.87)	-3.02**	3.81 (1.14)	3.60 (0.86)	-1.20
Electronic monitoring of performance makes me nervous	2.38 (0.74)	2.31 (1.08)	-0.13	2.26 (0.89)	2.48 (0.77)	-1.23
Able to remain focussed on job while on duty	3.75 (0.84)	3.88 (0.80)	-0.39	3.87 (0.72)	3.68 (0.94)	-0.75
Enough support alongside to maintain submarine	2.68 (1.02)	2.06 (1.00)	-2.02*	2.52 (1.12)	2.48 (0.96)	-0.10
Squadron internal communication is effective & fosters teamwork	2.72 (0.96)	1.94 (0.85)	-2.76*	2.26 (0.96)	2.80 (0.96)	-1.97*
Last minute changes to work schedules	3.72 (0.96)	4.25 (0.85)	-1.97*	3.97 (0.98)	3.76 (0.92)	-0.98
Separation from extended family making it difficult to do job	2.70 (1.06)	3.13 (1.15)	-1.45	2.84 (1.03)	2.80 (1.19)	-0.22
Separation from extended family making it difficult to relax	2.62 (1.03)	3.19 (1.05)	-1.93*	2.84 (0.97)	2.72 (1.17)	-0.52
Separation from long term friends making it difficult to relax	2.60 (0.93)	3.13 (1.02)	-1.91*	2.68 (0.87)	2.84 (1.10)	-0.44
Separation from immediate family making it difficult to do job	3.03 (1.07)	3.44 (1.21)	-1.32	3.35 (1.17)	2.88 (1.01)	-1.56

*p <.05 (without Bonferroni correction)
** Significant after Bonferroni correction

6.2.1a Officers and Senior Sailors versus Junior Sailors

Significant differences were found in the number of years served in the Navy, and in Submarine Service, between Junior Sailors, and Officers and Senior Sailors. Officers and Senior Sailors had spent a greater number of years in both the Navy and Submarine Service than Junior Sailors. This difference for time spent in the Navy is not surprising given that more time is required to progress through the rank hierarchy. In addition, sailors in the surface fleet usually transfer into Submarine Service at the junior level, again resulting in greater time served in Submarine Service if they are now at the more senior ranks.

Attitudes towards manpower and working hours indicated a significantly greater level of disagreement in the higher ranks regarding having sufficient personnel to get the job done properly (Bonferroni corrected), being happy with current working hours, and getting a break in workload when working alongside (without Bonferroni correction). The higher ranks also indicated greater negative impact on job performance as a result of current manning levels (without Bonferroni corrections) (Table 17).

With regards to level of demand in their work, Officers and Senior Sailors reported significantly higher demands (‘much to ‘very much’) in the areas of mental and perceptual activity, hard work required, and a trend for greater time pressure than Junior Sailors. They also reported higher (‘moderate’) job frustration. Junior Sailors, on the other hand, reported a trend that their job required more physical activity.

Officers and Senior Sailors reported significantly greater agreement that their work is mentally exhausting. Other trends were that Officers and Senior Sailors had a poorer perception of how submariners are viewed within the Navy, more strongly disagreed that there is enough support alongside to maintain the submarines, and disagreed that the submarine squadron maintains effective internal communication. Higher ranked submariners indicated encountering short notice changes to the work schedules more so than their junior counterparts. Junior Sailors experienced less difficulty relaxing away from work due to separation from extended family and friends (see Table 17).

6.2.1b Married versus Single Personnel

There was only one trend between the marital status categories. On the submariner attitudes scale, mean ratings were higher for single personnel on the item regarding internal communication, indicating that married personnel have a poorer view on the effectiveness of the submarine squadron internal communication and its ability to foster teamwork (Table 17).

6.2.2 Work Factor Relationships

The relationship between length of time spent in the current posting, the job demand item of job frustration, and coping techniques was investigated at pre-test. Correlations between posting time, and years spent in the Navy and Submarine Service were computed using Pearson's correlation coefficients. Spearman's rank order correlations were computed for all the remaining data, and the findings are presented in Table 18.

Table 18

Relationships Between Work Factors and Coping Resources

Item	Posting Time	Job Frustration	Recreation	Self Care	Social Support	Rational Coping
Years in Navy	-.17	.18	-.37**	.10	.03	.16
Submarine Service Years	.006	.19	-.33*	.17	.09	.09
Current Posting Months	1.00	.06	-.04	-0.21	.06	-.06
Manpower/Working Hours						
Current manning levels mean I don't get enough shore time to recover	.21	.44**	-.33*	-.14	.08	.09
We have enough personnel to ensure the job gets done properly	.01	-.44**	.26	-.05	.04	.07
I can't perform my job effectively due to current manning levels	.03	.50**	-.26	-.22	-.01	-.14
In general, I am happy with my current working hours	-.04	-.47**	.38**	.07	.07	.18
I don't get to spend enough time with my family and friends	.19	.44**	-.26	-.14	-.18	-.08
Constant changes to the work schedule make it difficult to plan family or leisure activities	.31*	.43**	-.22	-.20	.03	-.03
Working alongside gives me a break in my workload	-.02	-.25	.42**	.05	.006	-.009
Training & Preparation						
Prepared to meet operational requirements	.15	-.28*	.05	.30*	.22	.29*
Prepared for technical/specialist aspects	.20	-.17	.04	.20	.11	.17
Prepared for lifestyle changes	.11	-.30*	.16	.26	.33**	.36**
Job Demands						
Mental and perceptual activity	.03	.13	-.10	.08	-.13	.01
Physical activity	-.00	.15	.06	-.08	-.11	-.06
Time pressure	-.02	.40**	-.15	.07	-.26	-.10
Hard work	.04	.31**	-.23	.009	-.28*	-.11
Frustrations on the job	.06	1.00	-.50**	-.15	-.24	-.23
Submariner Views						
Crew works well as a team	.30*	-.20	.14	.05	.03	.18
COLLINS submariners perceived as elite	.07	-.48**	.35*	-.04	.06	.07
Little teamwork & cooperation among crew	-.17	.15	-.03	-.12	-.03	-.24
Closest relationships with people I work with	.22	-.13	-.14	-.16	-.19	-.14
Negative media attention makes work less satisfying	.13	.32*	-.25	-.16	-.09	-.07
Media attention on 'problems' blown out of proportion	.19	-.22	-.12	-.13	.16	.12
Submarine doesn't meet safety requirements	.21	.58**	-.20	-.20	-.02	-.12
No major safety concerns at sea	-.08	-.55**	.07	.16	.004	.01
Work on submarine is mentally exhausting	.06	.43**	-.34*	-.22	-.27*	-.25

(Table 18 continued on pp.101)

Item	Posting Time	Job Frustration	Recreation	Self Care	Social Support	Rational Coping
Electronic monitoring of performance makes me nervous	-.03	.16	-.11	-.27*	-.34*	-.41**
Able to remain focussed on job while on duty	-.04	-.36*	.06	.28*	.17	.16
Enough support alongside to maintain submarine	-.14	-.53**	.42**	.14	.20	-.001
Squadron internal communication is effective & fosters teamwork	-.09	-.46**	.44**	.12	.007	.13
Last minute changes to work schedules	.11	.29*	-.20	-.25	-.01	-.11
Separation from extended family - difficult to do job	-.12	.26	-.19	-.15	-.29*	-.05
Separation from extended family - difficult to relax	-.19	.31*	-.33*	-.04	-.34*	.006
Separation from long term friends - difficult to relax	-.20	.34*	-.24	-.07	-.37*	-.09
Separation from immediate family - difficult to do job	-.20	.27*	-.26	-.23	-.29*	-.20

*p<.05 (without Bonferroni correction)
**Significant after Bonferroni correction

6.2.2a Length of Posting Time

There was a trend for frequent work schedule changes creating difficulties planning family or leisure activities to be associated with greater length of time spent in their posting (.31, p<.05, without Bonferroni correction). Those respondents who were longer in the posting also believed their crew worked well as a team (.30, p<.05, without Bonferroni correction). None of the remaining correlations were significant (Table 18).

6.2.2b Frustrations on the Job

Job frustration had significant associations with many of the work aspects and views examined (Table 18). Higher job frustration was experienced where respondents identified a negative impact of manning on shore recovery time, job standards and job performance, and when they indicated dissatisfaction with working hours, insufficient time with family and friends, and negative impact from frequent work schedule changes.

Greater time pressures and hard work were associated with greater job frustration. Personnel who rated job frustration highly also indicated poorer perceptions of submariners, expressed safety concerns, identified their work as mentally exhausting, indicated insufficient support alongside, and perceived internal communication to be poor. Other weaker relationships with job frustration (significant without Bonferroni correction) were between being poorly prepared for operational requirements and lifestyle changes, negative impact of media attention, difficulties remaining focussed on duty, last minute changes to work schedules, and difficulties doing their job and relaxing as a result of separation from family and friends.

Most of the items associated with greater job frustration are out of the submariners' control – for example, manning issues, time pressure, work hours, and work schedule changes. Other factors that are linked to increased job frustrations appear to result from a lack of recognition. Where personnel have some control, the relationships with job frustration tended to be less strong (e.g. with hard work, remaining focussed, and in training and being prepared).

6.2.2c Coping Resources

The four coping resources of recreation, self-care, social support and rational coping were examined against the work factors and attitudes at pre-test (Table 18). Greater recreational activity was associated with fewer years spent in the Navy, being happier with work hours, getting a break in workload, having less frustrations on the job, perceiving there to be sufficient support alongside to maintain the submarine, and the squadron having effective internal communication (significant after Bonferroni correction). Other weaker associations (significant without Bonferroni

correction) were identified between more time engaged in recreation and fewer years spent in Submarine Service, manning enabling enough shore time for recovery, perceiving submariners as elite, less mental exhaustion from the job and being able to relax despite separation from family.

Given the earlier findings that on average personnel were not happy with their current working hours, and did not get a break in their workload, it is likely that recreation is not often employed as a coping strategy.

Greater use of self-care strategies was associated with feeling prepared for operational requirements, less performance anxiety, and being able to remain focussed on duty (only significant without Bonferroni correction). Better social support was associated with being prepared to meet lifestyle changes; less hard work, mental exhaustion, and concern from performance monitoring, and less separation-related difficulties (only significant without Bonferroni correction). These are trends that account for only a small proportion of the total variance, and there is a possibility that they may be chance findings.

Greater use of rational coping was associated with being better prepared to meet the lifestyle changes associated with the job, and being unaffected by performance monitoring. There was also a trend towards being better prepared to meet operational requirements.

Previously it was identified that job frustration had significant associations with many of the views and attitudes about manpower, working hours, job demands, and

service life. The coping resource of recreation had a strong negative relationship with job frustration, and had a greater number of associations with the examined views and attitudes about working hours, workload, manpower and support, separation, and communication than the other coping resources. This suggests that this coping technique may be important in relieving frustration and promoting more positive views.

6.2.3 Dependent Variable Comparisons

Nonparametric tests (Mann-Whitney U) were used to investigate the differences on the dependent variables between the same demographic categories: Officers and Senior Sailors versus Junior Sailors; married personnel versus single personnel. The findings are presented in Table 19.

Table 19

Rank and Marital Status Differences for the Dependent Variables

Dependent Variable	Junior Sailors Mean (*SD*)	Officers / Senior Sailors Mean (*SD*)	Mann–Whitney U	Married Mean (*SD*)	Single Mean (*SD*)	Mann – Whitney U
DASS						
Depression	3.78 (4.89)	5.94 (4.62)	-1.79	5.41 (5.30)	3.25 (4.10)	-1.31
Anxiety	1.65 (2.32)	5.69 (7.74)	-2.52**	3.76 (5.97)	1.79 (3.15)	-1.24
Stress	6.00 (6.49)	12.12 (7.76)	-2.79**	7.96 (7.56)	7.71 (7.30)	-0.03
ORQ						
Role Overload	25.80 (6.57)	33.75 (6.18)	-3.62**	27.71 (7.34)	28.52 (7.50)	-0.39
Role Insufficiency	28.37 (6.39)	26.06 (6.77)	-1.03	27.87 (6.07)	27.52 (7.17)	-0.54
Role Ambiguity	23.57 (5.84)	25.31 (7.12)	-0.93	24.06 (7.16)	24.08 (4.94)	-0.13
Role Boundary	22.67 (5.76)	24.69 (4.77)	-1.28	23.06 (6.12)	23.48 (4.80)	-0.38
Responsibility	22.92 (5.16)	37.12 (5.80)	-5.41**	28.71 (8.48)	24.84 (7.86)	-1.70
Physical Environment	23.75 (6.73)	27.44 (7.82)	-1.57	24.90 (7.28)	24.68 (7.22)	-0.08
PSQ						
Vocational Strain	19.81 (5.08)	22.00 (5.85)	-1.28	20.69 (5.24)	20.21 (5.61)	-0.47
Psychological Strain	20.35 (7.29)	25.62 (7.98)	-2.27*	22.93 (7.93)	20.75 (7.69)	-0.99
Interpersonal Strain	21.21 (6.19)	23.69 (6.72)	-1.57	20.83 (4.74)	23.33 (7.84)	-0.67
Physical Strain	20.35 (6.93)	24.87 (10.23)	-1.46	22.24 (8.85)	21.08 (7.56)	-0.20
PRQ						
Recreation	25.77 (5.54)	19.31 (4.28)	-3.70**	22.03 (5.83)	26.28 (5.32)	-2.64**
Self Care	20.40 (5.00)	21.69 (6.92)	-0.71	20.26 (5.85)	21.40 (5.28)	-0.95
Social Support	35.62 (9.39)	37.37 (10.06)	-0.63	39.09 (9.45)	32.44 (8.41)	-2.80**
Rational Coping	31.47 (6.35)	31.62 (6.82)	0.00	31.80 (7.16)	31.16 (6.43)	-0.59
Job Satisfaction	3.28 (1.08)	2.94 (1.06)	-1.12	2.90 (0.94)	3.52 (1.16)	-2.14*
Job Performance	3.95 (0.71)	3.87 (0.80)	-0.16	3.97 (0.70)	3.88 (0.78)	-0.32
General Wellbeing	26.67 (6.84)	34.69 (10.94)	-2.56*	30.35 (9.46)	27.24 (8.00)	-1.23
Health	2.70 (0.76)	2.25 (0.85)	-1.73	2.42 (0.85)	2.76 (0.72)	-1.36
Sickbay attendance	0.57 (0.84)	1.31 (1.74)	-1.22	1.00 (1.29)	0.52 (1.04)	-1.89

*p<.05 (without Bonferroni correction)
**Significant after Bonferroni correction

6.2.3a Officers and Senior Sailors versus Junior Sailors

Officers and Senior Sailors reported significantly greater anxiety and stress symptoms, and strain in the areas of role overload, and responsibility than Junior Sailors. Mean ratings for Officers and Senior Sailors on both the Role Overload and

Responsibility scales were above 60T, indicating at least mild levels of maladaptive strain in these areas (Table 19). Typically, individuals reporting high levels of responsibility and worry for subordinates in terms of activities and work performance are high scorers on the Responsibility scale. They are usually required to respond to others' problems and are often sought for leadership (Osipow, 1998). This fits with the role of the Officers and Senior Sailors within the naval divisional system. In addition, a trend for reporting highly on the Psychological Strain scale suggests they may be depressed, anxious, and/or irritable, have no sense of humour, respond poorly in routine situations, and complain about little things (Osipow, 1998). This is consistent with this group's high rating of anxiety and stress symptoms.

Significant differences were also reported on the Recreation scale, with Junior Sailors engaging more often in recreational activity than Officers and Senior Sailors. The mean ratings for the latter were approaching mild deficits on this coping resource. It is also important to note that Officers and Senior Sailors reported significantly more health complaints than Junior Sailors. There were no other significant differences between these two categories on the remaining variables (Table 19).

6.2.3b Married versus Single Personnel

Significant differences in mean ratings were recorded for the Recreation and Social Support scales of the PRQ, and a similar trend was identified for job satisfaction. Single personnel spent more time doing recreational activities than married personnel. On the other hand, they made less use of social supports. Job satisfaction was rated more strongly by single personnel (Table 19).

6.2.4 Outcome Measures Relationships

Relationships between length of time spent in the current posting, the job demand item of frustrations on the job, and coping techniques were investigated. Spearman's Rho correlations were computed for the nonparametric dependent variables of job satisfaction, job performance and health. Pearson's correlation coefficient was used for the remaining parametric dependent variables. The findings are presented below.

Table 20

Correlation Coefficients for Each of the Outcome Measures

Dependent Variable	Posting Time	Job Frustration	Recreation	Self Care	Social Support	Rational Coping
DASS						
Depression	-.06	.48**	-.31*	-.13	-.23	-.11
Anxiety	-.14	.42*	-.36**	-.14	-.15	-.25
Stress	-.15	.46**	-.36**	-.19	-.30*	-.20
PSQ						
Vocational Strain	-.02	.63**	-.28*	-.06	-.22	-.36**
Psychological Strain	-.13	.59**	-.49**	-.27*	-.29*	-.34**
Interpersonal Strain	.15	.44**	-.29*	-.17	-.35**	-.27
Physical Strain	-.06	.60**	-.53**	-.37**	-.34**	-.42**
ORQ						
Role Overload	.04	.52**	-.21	-.08	-.16	-.09
Role Insufficiency	-.01	.54**	-.21	-.34*	-.32*	-.33*
Role Ambiguity	-.10	.35**	-.25	-.36**	-.34*	-.34*
Role Boundary	-.04	.46**	-.04	-.18	-.15	-.14
Responsibility	-.06	.38**	-.39**	-.02	.14	.12
Physical Environment	.01	.39**	-.08	-.04	.09	.16
PRQ						
Recreation	-.04	-.56**				
Self Care	-.21	-.15	.31*			
Social Support	.06	-.24	.18	.18		
Rational Coping	-.06	-.23	.24	.29*	.46**	
Job Satisfaction	.03	-.57**	.40**	.28*	-.10	-.01
Job Performance	.31*	-.15	.17	.24	.35**	.35**
General Wellbeing	-.08	.64**	-.60**	-0.31*	-.41**	-.42**
Health	-.10	-.36**	.43**	.43**	.26	.34*
Sickbay attendance	-.25	.21	-.29*	.06	-.15	-.07

*p<0.05 (without Bonferroni correction)
**Significant after Bonferroni correction

6.2.4a Length of Posting Time

A moderate positive relationship with job performance indicated that respondents who have been in their posting longer had better perceptions of their job performance (Table 20). This may be attributed to familiarity with their job role, the crew, equipment, and onboard conditions. It is important to note that longer time in the posting was not related to poorer job satisfaction. All other stress and strain variables showed weak associations with duration of posting and these were not significant.

6.2.4b Frustrations on the Job

Many significant relationships were found. Job frustration had moderate to strong associations with all the strain variables, increased depression and stress, less recreational activity, and poorer job satisfaction, general wellbeing, and health. There was also a weak association between job frustrations and increased anxiety (Table 20).

6.2.4c Coping Resources

Greater use of recreation as a coping resource was associated with less anxiety and stress, and psychological and physical strain. It was also found that those who spent more time involved in pleasurable recreational activity experienced less strain in the area of responsibility. This may also be due to those individuals with less responsibility in the workplace having more time to engage in such activities. Robust relationships were also found with better job satisfaction, health and general wellbeing. Weak relationships were found with less depression, interpersonal strain, and sickbay attendance (Table 20).

As might be expected, better self-care was related to better health outcomes (Table 20). In terms of work outcomes, a robust finding was its association with decreased role ambiguity strain, which measures clarity of priorities, expectations, and evaluation criteria in the workplace (Osipow, 1998). A trend showing a negative relationship with role insufficiency strain, and increased job satisfaction was identified. This suggests that having a better job-skills match, and understanding of the role, is associated with use of appropriate self-care resources.

The more social support personnel felt from those around them the better their interpersonal working relationships, the more confidence they felt in their performance, the greater overall sense of wellbeing and consequently less physical illness complaints (Table 20). Previous research has shown social support to buffer against stress and emotional problems (Cohen & Wills, 1985; Gerpott, 1990; Holahan & Moos, 1981; House et al., 1988; Kobasa et al., 1982; Leavy, 1983; Limbert, 2004; Mitchell et al., 1982). Similar trends were found in this study, in terms of less stress and psychological strain symptoms. Weak effects were also found with role insufficiency and role ambiguity strain. This is logical given the role others in the workplace have in these two strain areas.

Using cognitive skills to deal with work-related stressors was associated with better work quality, attitudes to work, and less emotional and physical illness complaints. These relationships demonstrate the importance of using rational problem solving techniques to manage personal strain. Greater use of cognitive skills was also associated with greater confidence in job performance, which could be expected, and

better general wellbeing. There were also trends for less role insufficiency and role ambiguity strain, and better health reporting (Table 20).

In general, lack of recreational activity was associated with many of the stress and strain variables, as well as poor work outcomes. In particular, it was associated with higher job frustration, which in turn was related to many of the strain variables. It might be expected that improved use of recreation would reduce job frustrations, and in turn reduce internal symptomatology, and improve work outcomes. Alternatively, the findings may indicate that people who aren't overworked have more time for recreation.

6.3 Discussion

Categorical comparisons by rank (Officers and Senior Sailors versus Junior Sailors) and marital status ('married' versus 'single' personnel) were examined in relation to work factors and each of the outcome measures. Also examined in this chapter were the relationships between length of posting, job frustration, and coping resources, with work factors and outcome measures. The methodological issues in relation to this study will be identified, and then key findings for rank, marital status, length of posting, job frustration and coping strategies will be discussed. This section concludes with a short summary and recommendations.

6.3.1 Methodological Issues

As with the previous study (Chapter 5), many comparisons were made throughout this particular study between categories, work factors and dependent variables, increasing the possibility of Type I errors. Bonferroni corrections were calculated to

adjust for multiple comparisons within categories. In addition, trends in the data were also noted.

Correlations were computed for some of the data. Several robust relationships were identified but in these instances causality could not be determined, and the third variable problem could not be completely eliminated (Whitley, 1996). For example, personnel who used more self-care techniques showed less strain in the area of role ambiguity. Other variables that may be involved and have contributed to these two factors being correlated could be education, training, support, and management style.

6.3.2 Rank

Officers and Senior Sailors held a number of views that differed from those of Junior Sailors. In particular, they showed greater disagreement that there are enough personnel to get the job done properly, and they reported that their job involved greater mental and perceptual activity, hard work, and was more mentally exhausting. With regards to symptomatology, the higher ranks reported more anxiety and stress, and greater strain in the areas of role overload, and responsibility. Officers and Senior Sailors generally have greater responsibilities than Junior Sailors and as such this can result in role overload. Included in their responsibilities is the additional requirement to work toward specific targets, whereas Junior Sailors are able to focus solely on their day-to-day job role. This could influence their higher stress and anxiety ratings, and also their different organisational views regarding manning. It would seem that these higher rank groups require more organisational support, which could be in the form of modifying their work roles.

Personnel undertake leadership and management courses as part of their promotional requirements, although it may be some time before they are required to apply some of their learned skills. Providing refresher management training could be beneficial, targeting such skills as conflict management, critical incidents, managing underperformance and providing performance feedback, dealing with the impact of organisational change, and coaching and mentoring subordinates. This would enable them to more directly and immediately respond appropriately to workplace issues. Education regarding stress and wellbeing in the workplace would also be important in facilitating understanding and awareness to identify the early warning signs of distress.

This study aimed to determine if particular resources made a difference to stress and strain experienced, attitudes and coping in the submarine environment. Junior Sailors recorded engaging in recreational activity more often than Officers and Senior Sailors. Overall, they reported better views of their job and of the Service, and they reported less psychological strain and health complaints. These findings are consistent with earlier research which detected psychological strain, typically depression, anxiety and poor general health in managers (Hobson & Beach, 2000). These findings suggest that the higher ranked groups could also benefit from engaging in recreational activity. However, the higher ranked sailors did not get a break from their workload when alongside and reported more time pressure. Thus, the Navy hierarchy should be supportive in providing opportunities for exercise and recreation for Officers and Senior Sailors.

6.3.3 Marital Status

Personnel were also examined by marital status based on Brown's (1999b) findings regarding the negative impact of separation from loved ones on stress, performance and coping. The aim was to determine whether negative effects were greater in married or single submariners, and whether different coping mechanisms were employed in these two groups.

Married personnel differed from single personnel in only one attitudinal area, which was regarding the effectiveness of the squadron's internal communications. Both groups disagreed that it was effective but married personnel showed more disagreement. As discussed below, married personnel had a preference for using social support as a coping mechanism. This may suggest that they have different expectations in terms of communication, and place greater importance on it.

There were no significant differences between marital status categories on the stress and strain variables. However, different coping techniques were employed, with married personnel more likely to use social support but do less recreational activity than single personnel. On the other hand, single personnel reported greater job satisfaction.

Research on British military personnel on unaccompanied tours in the Falklands found perceived social support to be a significant predictor of job satisfaction (Limbert, 2004). However, job satisfaction was also aided by the use of positive reinterpretation and growth. Submariners are more greatly restricted in their communications with loved ones when on deployment than most other military

personnel, thus limiting the impact of social support (outside of work) through greater isolation. There has been ongoing debate as to whether to provide email communication onboard submarines, as is made available on ships. Research with soldiers on deployment found that keeping them updated with events back home and providing communication with their families eased separation-related difficulties (Rotter & Bojeva, 1999). Adding to the argument are numerous previous studies finding social support to be important for coping with stressful situations (Cohen & Wills, 1985; Gerpott, 1990; Holahan & Moos, 1981; House et al., 1988; Kobasa et al., 1982; Leavy, 1983; Mitchell et al., 1982). However, the nature of submarine exercises can mean that personnel cannot immediately respond to home 'crises'. Having this information, but being unable to act, has the potential to leave the submariner feeling highly anxious, frustrated and helpless, and would likely impact on their performance and safety through reduced concentration and focus. At this point, the lack of clinical findings or significant differences between the marital status categories provides little support for the use of email communication. However, enabling forms of positive communication and information updates would seem worth pursuing. The current use of 'family grams' – number coded information representing phrases about family life from families to personnel – would be an example of this. The more recent introduction of reverse family grams has also been beneficial, with submariners using this service regularly.

It was also considered whether a compulsory Social Worker's assessment of the family situation may be required as part of the selection process. In the absence of significant problems for married personnel, automatically including this type of assessment is not considered necessary and its use should continue to be on a case-

by-case basis. Encouraging married personnel to make more use of recreational coping strategies may help to compensate for the isolation from social supports when at sea.

6.3.4 Length of Posting

With the boats now being fully operational, the length of posting was examined to determine whether longer exposure to the operational environment increased stress and strain. In terms of job factors, those who had been in the posting longer were more affected by frequent work schedule changes in relation to planning family and leisure activities. On a more positive note, those longer in the posting reported better views of their crew working as a team. Good teamwork is vital to the successful operation of the submarine. Unexpectedly, greater length of time in the operational environment was not related to increased symptomatology or strain. In fact, it was found to be related to better job performance. This would likely be the result of increased familiarity with the boat crew and equipment.

6.3.5 Job Frustration

The job demand variable of ‘frustrations on the job’ was examined due to its impact on performance, mood and strain in Brown’s (1999b) study. Previous research has found that individuals with high job demands and less degree of control in their work can experience more physical strain effects (Houtman et al., 1994; Karasek & Theorell, 1990; Siegrist, 1996). It was thought that having less control may also result in more job frustration for Junior Sailors. However, Officers and Senior Sailors experienced greater job frustrations in this study. Given that higher ranked submariners also reported more mental demands, this finding could be because they

have to consider the ‘bigger picture’ more so than Junior Sailors, and they have to filter through multiple data sources to accomplish their job. Higher ranked submariners act as managers and have divisional responsibilities to manage the welfare of their subordinates. However, middle management does not have complete autonomy and are still answerable to the hierarchy. Junior Sailors have less complex roles and in this case having less control did not increase their job frustration.

When coping techniques were examined against job frustration, it was found that more recreational activity was associated with less job frustration. As already stated, Junior Sailors employed this coping resource more often than their higher ranked counterparts, and this could account for their lower reports of job frustration.

In relation to manpower and working hours, training and preparation, job demands and submariner views, feeling more frustrated on the job was related to many negative views and attitudes. These were generally held for issues that were largely out of the submariners’ control such as manning, working hours, public perception, work schedule changes, and separation-related difficulties. These findings of submariners as a whole, as opposed to using rank group distinctions, support previous research regarding lack of job control.

6.3.6 Coping Strategies

Of the coping techniques examined, recreational activity seemed to be the most effective in terms of promoting positive views and attitudes, reducing stress and strain, and improving job satisfaction and health. Integrated health programs that include exercise, aerobic activity, health, and nutrition components have been found

to be effective as work stress interventions (Ihlebaek et al., 2002; Pruitt, 1992). This obviously raises some implementation difficulties in the submarine environment, but such strategies could be more readily employed when alongside. The base Physical Trainers could be utilised in relation to developing and implementing customised health programs when the boats are alongside. Such programs would need to be scheduled into the boat's programs to ensure attendance and opportunity. Rational coping was also associated with less personal strain and improved health. These findings confirm the importance of including such strategies within a stress management program.

6.3.7 Summary & Recommendations

In conclusion, organisational efforts would be best focussed on:

- revising or modifying work roles of Officers and Senior Sailors
- providing refresher management skills training
- providing opportunities for and/or including compulsory recreational/physical activity
- using positive communication resources
- providing education on the effects of stress and benefits of exercise and activity
- teaching rational coping techniques to cope with enforced situations with less personal control
- promoting positive reinterpretation and growth.