

Work-related stress in Her Majesty's Coastguard

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ABSTRACT

Background. As a previously unresearched occupational group, the overall aim of this research was to establish the prevalence of stress and associated outcomes in Her Majesty's Coastguard (HMCG).

Material and methods. Data were collected from 282 coastguards by paper questionnaire and compared with general UK working population data from the Bristol Stress and Health at Work Study (SHAW) and the Psychosocial Working Conditions Survey (PWC), 2009.

Results. The level of high stress reported in HMCG (11%) was significantly lower than the comparison data (17%). The level of depression found was significantly higher.

Conclusions. HMCG had lower levels of stress than the general UK working population, due, in part to high levels of social support. Data suggests HMCG worthy of study for both negative effects of stress and stress reduction elsewhere.

(Int Marit Health 2011; 62, 2: 148-154)

Key words: stress, coastguards, depression, support

INTRODUCTION

Research on stress in the maritime sector is very limited. Increased automation and the decreased number of seamen per ship have been reported as major causes of stress-related psychological problems [1]. In a multi-occupational sample from the Finnish merchant fleet it was found that the engine crew reported the highest stress levels [2]. In a study from the German shipping industry, no significant differences in frequency of psychosocial stressors were found between engine room, deck, and catering crew [3]. A survey of more than 22,000 seamen in the US merchant fleet found that mid-level managers (both in deck and engine room crew) had significantly more health problems and emotional disturbances compared to other ranks [4]. Higher stress levels for officers were also found in the German merchant fleet [3]. In general, however, the self-rated health status among seafarers is relatively good, although this may be due in part to selection factors and the "healthy

workers effect", as well as to systematic under-reporting [5]. A recent study [6] suggests that role conflict is a major factor that produces stress in seafarers who have to work to professional standards but also operate the ship with reduced crew numbers and high speed, so as to satisfy the requirements for profitability.

The maritime sector involves other occupations than seafarers, and the present study investigated stress in the coastguard and is the first to report data on this topic. This first paper considers the scale of perceived stress and subjective reports of health outcomes. Another part of the research examines psychosocial risk factors (job demands/control/support; effort/reward imbalance), and this will be reported in a second paper.

GENERAL OVERVIEW OF HMCG DUTIES

As a uniformed emergency service, HMCG provides a civil maritime search and rescue response

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from 19 Maritime Rescue Co-ordination Centres located around the UK coast. It is their responsibility to **co-ordinate** activities to help persons either in distress at sea or at risk of injury or death on the cliffs and shoreline of Britain. HMCG are supported by the other UK emergency services (Police, Fire and Rescue, Ambulance), volunteer rescue organisations (e.g. the Royal National Lifeboat Institution), a volunteer Coastal Rescue Service, and various other government organisations, to carry out the **actual** rescue activity [7]. HMCG forms part of the Maritime and Coastguard Agency (MCA), which in turn forms part of the UK government's Department for Transport.

WHY STUDY HMCG?

There were several reasons for studying this occupational group: 1. given the nature of the role, it is reasonable to assume that dealing with lifesaving scenarios could be stressful. 2. Evidence of serious levels of work-related stress has been found in other emergency services [8–10]; therefore, it is not unreasonable to assume that HMCG, also an emergency service, would not be any different. 3. The number of cases of self-reported stress within the UK in general [11] (as in Europe [12] and elsewhere in the world [13]) has been increasing. 4. The well-documented Whitehall Studies [14, 15] found evidence of stress and negative health effects in UK civil servants. As HMCG are also civil servants, it is reasonable to assume that they would also be exposed to stress (at least to some degree). 5. A risk assessment was conducted through 18 face-to-face interviews with a sample of coastguards and other relevant staff, which elicited a wide range of potential stressors. 6. There have been few studies comparing psychosocial workload or mental health across different occupations, or to that of the working population [16, 17]. This includes seafarers or those working in maritime related roles [6, 17].

STRESS AND HEALTH IN MARITIME RELATED ROLES

Aside from this lack of research comparing stress in maritime related roles with other occupations, there is a lack of studies on stress in maritime workers in general; with very few in relation to coastguards on any subject [17]. Over 50% of HMCG who participated in this study came from previous maritime related roles. Seafarers work in environments where a number of factors associated with stress can be found, such as: long working hours, high demands,

shift work, noise, and vibration [2, 18]. Stress can lead to fatigue (also under researched), which can lead to accidents and health problems [19]. This is a problem as seafarers are increasingly expected to take on heavier workloads with less crew support, and to work longer hours with less time off to recuperate [20].

COMPARISON STUDIES, SHAW AND PWC 2009

A further problem is the lack of available, consistent, and reliable data from which to make relative comparisons; primarily due to the number of different approaches taken. In the current research, this was remedied through use of data from the Bristol Stress and Health at Work Study (SHAW) [21] and high-level, published statistics from the UK government run Psychosocial Working Conditions Survey (PWC) [22]. SHAW (2000) is a well documented study which aimed to determine the prevalence and severity of occupational stress in a random UK community sample. Since the launch of the HSE Management Standards [11] (the UK government's guidelines for the reduction of work stress) in 2004, the annual PWC Survey, which uses an Indicator Tool [11] as a means to benchmark against them, is now conducted to provide a more reliable estimate.

HYPOTHESES

Two hypotheses were tested:

H1: Stress levels within HMCG would be at least the same as the general UK working population.

H2: Stress would result in a number and range of negative outcomes.

MATERIAL AND METHODS

PROCEDURE

Data were collected anonymously via a 24 × A4 page paper questionnaire. Copies were distributed internally throughout HMCG by the MCA but returned completed to Cardiff University for processing. Pre-survey consultation took place via internal communication and with Public and Commercial Services Union (PCS) representatives, to enlist trade union support.

VARIABLES

Based on data collected in the pre-survey risk assessment, scales and single items measured in the study were those presented in Table 1. A range of standard sample and demographic characteristics

Table 1. Measures included in the study

Risk Factors
Job Demands-Control-Support (JDCS) [23]*
Appraisals/Perceptions
Work stress (<i>In general, how do you find your job? not at all/mildly/moderately very/extremely stressful</i>) [18, 21]*
Life stress (<i>How do you find life in general? not at all mildly/moderately/very/extremely stressful</i>) [18, 21]*
General health (<i>Over the past 12 months how would you say your health has been? very good/good/fair/bad/very bad</i>) [18, 21]*
Job satisfaction (e.g. <i>Are you satisfied with your job?/take home pay?</i>) [18, 21]
Is the MCA an attractive place to work? [17]
Outcomes (health, accidents and injuries, behavioural and home-work balance)
Number of sick days in last 12 months [18, 21]*
Have you suffered from any illness you think was caused/made worse by work? [18, 21]
HADS (anxiety and depression) [24]*
Symptoms and medication [18, 21]*
Epworth (sleepiness) [25]
How frequently do you suffer from insomnia? [18, 21]
Accidents and injuries [18, 21], memory problems [18, 21], risk taking [18, 21]
Smoking [18, 21], drinking [18, 21]
Do you maintain a desired bodyweight/take planned exercise/find time to relax? [26]
Number of hours per week spent on hobbies/interests [17]
Impact of family life on job/job on family life [18, 21]
Individual characteristics
Negative affectivity [18, 21], coping [27]

*Indicates measures used for comparison between HMCG and BSW samples

were also included (e.g. working arrangements, age, gender, ethnicity, and annual income).

PARTICIPANTS: HMCG

The total number of participants was 282 (response rate = 47%). 95% were full-time, 99% were permanent employees, 77% worked shifts, 76% were male, 64% were aged between 41–60 years, and 94% earned between £10,000 and £29,999 per annum.

PARTICIPANTS: SHAW (BSW) AND PWC 2009 COMPARISON SAMPLES

The SHAW data used here contained an extracted subsample of 1,892, who had completed the two study surveys carried out, and who had also indicated that they were currently working (hereafter referred to as Bristol Study Workers [BSW]). 73% were full-time, 88% were permanently employed, 14% worked shifts, 43% were male, 47% were aged between 41–60 years, and 62% earned between £10,000 and £29,999. Data for the annual PWC surveys is collected via an omni-

bus survey with a representative sample of the working population across the UK. The latest results available, used here, were from 2009 [22].

TREATMENT OF DATA

Data were analysed using univariate ANOVA. After testing for significant differences and associations, comparisons between HMCG and BSW samples were controlled for age, gender, and income (see differences above), and data involving perceived stress was controlled for negative affectivity and coping if the analysis involved depression.

RESULTS

H1: THE LEVEL OF STRESS FOUND IN HMCG WOULD BE AT LEAST THE SAME AS THE GENERAL UK WORKING POPULATION

The level of perceived work stress found in HMCG was 11% **very** or **extremely** stressed, compared to 17% found in both the BSW and PWC comparison

Table 2. Comparison of HMCG and BSW on perceived work stress, life stress, and general perception of health

Variable	Study group	M	SD	N	df	F	p
Work stress	HMCG	1.46	0.88	261	1, 2045	13.41	< 0.001
	BSW	1.73	0.89	1789			
Life stress	HMCG	1.10	0.83	263	1, 2053	6.58	0.01
	BSW	1.33	0.82	1795			
General health	HMCG	0.79	0.58	263	1, 2060	20.33	< 0.001
	BSW	1.02	0.79	1802			

groups. When tested, this difference was significantly **lower**, even when further analyses were undertaken to reflect differences **between** HMCG and BSW reported above, such as age and gender, or differences **within** the HMCG group such as those undergoing training or not, or those with previous maritime experience or not. The same pattern of results for work stress was also found in relation to life stress (HMCG 5% **very** or **extremely** stressed compared to 8% in the BSW sample). HMCG were also found to have a significantly more positive attitude to general health (only 1% rated that their health was **bad** or **very bad** compared to 3% in BSW). These results are presented in Table 2.

A potential moderating factor in these results was the level of social support, which was found to be significantly higher in the HMCG group when compared to the BSW sample, where $F(1, 2062) = 19.35$, $p \leq 0.001$. The mean score for HMCG ($M = 12.51$, $SD = 4.67$) was higher than BSW ($M = 11.65$, $SD = 3.90$).

In keeping with the above, further analysis of HMCG responses to a general question on job satisfaction found that only 6% were either **never** or **rarely** satisfied or said that the MCA was **not** an attractive place to work. However, 17% reported negative perceptions of the work-life balance, which was higher than the 11% work stress and 5% life stress combined.

H2: STRESS WOULD RESULT IN A NUMBER AND RANGE OF NEGATIVE OUTCOMES

A series of ANOVAs were conducted to examine differences in mental and physical health outcomes between the HMCG and BSW groups, where comparable data was available (see Table 1). Significant differences were found in the level of depression, $F(1, 2063) = 3.86$, $p = 0.05$, where the mean score for HMCG ($M = 4.31$, $SD = 3.96$) was higher than BSW ($M = 3.86$, $SD = 3.15$). This difference extended to the level of clinical depression, where 7% ($n = 19$) of HMCG were found to be clinically depressed

compared to 4% ($n = 67$) in BSW. This difference was also significant, $F(1, 2063) = 6.48$, $p = 0.01$. There was also a significant difference found in the amount of medication taken in the last 14 days, $F(1, 1785) = 39.51$, $p = < 0.00$, where the mean score for HMCG ($M = 0.85$, $SD = 1$) was higher than BSW ($M = 0.50$, $SD = 0.78$).

As a follow up to the social support findings reported under H1, scores for the HMCG group were converted to quartile splits (to enable a dose response to be observed if it was present) and further analyses conducted to establish whether there were any significant associations between levels of support and outcome measures within this group. Coastguards with **low** social support were significantly more likely than those with high support: to take an increased number of sick days, believe that illness was caused/made worse by work, report more symptoms, take more medicine, report an inability to “relax and wind down”, report that their job impacted family life, and have lower job satisfaction. The results are presented in Table 3.

STRESS AND COPING

Finally, an examination of coping within the HMCG sample found no significant difference between those with high and those with low work stress. Descriptive statistics revealed that HMCG used a wide range of both problem and emotion-focused coping methods, the most frequent being, “talk with people who are involved” and “try to see the situation as an opportunity to learn and develop new skills”. In the literature, emotion-focused coping tends to be viewed negatively, as it involves avoidance, but there is evidence that this can be useful in some emergency contexts [9]. In the HMCG sample, the low stress group used methods such as “try to see the situation as an opportunity to develop new skills” and “try to think of myself as a winner, someone who always comes

Table 3. Significant differences between levels of social support within HMCG and outcomes

Outcome	Quartile	M	SD	N	df	F	p
Number of sick days in last 12 months	Q1	0.61	0.71	71	3, 270	6.15	< 0.001
	Q2	0.85	0.94	79			
	Q3	1.27	1.21	63			
	Q4	1.11	0.98	62			
Illness caused/made worse by work	Q1	0.13	0.34	69	3, 263	7.72	< 0.001
	Q2	0.08	0.27	75			
	Q3	0.35	0.48	63			
	Q4	0.33	0.47	61			
Symptoms in last 14 days	Q1	3.24	2.86	66	3, 250	4.80	< 0.01
	Q2	3.93	3.26	72			
	Q3	4.83	3.40	60			
	Q4	5.39	3.49	57			
Medicines taken in last year	Q1	1.00	1.03	67	3, 256	3.30	0.02
	Q2	0.93	0.93	76			
	Q3	1.38	1.32	58			
	Q4	1.55	1.55	60			
Ability to find time to “relax and wind down”	Q1	1.17	0.88	71	3, 271	6.91	< 0.001
	Q2	1.13	0.85	79			
	Q3	1.55	0.82	64			
	Q4	1.76	0.97	62			
Variable	Quartile	M	SD	N	df	F	p
Impact of job on family life	Q1	2.27	2.06	63	3, 250	8.75	< 0.001
	Q2	2.75	1.87	69			
	Q3	3.52	2.02	64			
	Q4	4.08	2.21	59			
Job satisfaction	Q1	2.32	0.85	62	3, 270	20.77	< 0.001
	Q2	2.38	0.75	64			
	Q3	2.95	0.72	78			
	Q4	3.20	0.77	71			

through”, more frequently, suggesting that greater use of emotion-focused coping is, indeed, useful in such a context.

DISCUSSION

LEVEL OF WORK STRESS

Contrary to expectations, HMCG as an emergency service had lower levels of perceived work stress than BSW and as reported through the PWC 2009 survey (i.e. the average working individual in the UK). Amongst other reasons, it is possible that this may be explained through the level of professiona-

lism, the age profile, and the nature of work. The majority of the HMCG sample had a considerable amount of training and experience (both in current and previous maritime related roles), and job satisfaction has been found to be U shaped with age and higher in not-for-profit organisations [28] Whilst high levels of stress have been found in police, fire, and ambulance worker groups [8–10], who are also not-for-profit organisations, the age profile of HMCG (64% aged between 41 and 60 years) may be particularly significant in this instance, as well as the work focus to prevent the loss of life and to save lives. Reasons for the 17% negative perception of

the work-life balance were not clear, but data suggested that this may have been related to working shifts.

An important finding was the level of social support. This was significantly higher in the HMCG group amongst colleagues and immediate superiors, probably due to the highly cohesive team culture both within Operations Rooms working in Watches and in working with other emergency and rescue related organisations, to successfully execute positive outcomes to incidents. Results indicated that the high level of support from working in Watches provided a significant moderator of stress, in addition to the use of a range of both problem and emotion-focused coping. However, what was not clear from the data were the additional benefits and dynamics of age, experience, job commitment, and proximity to incidents.

OUTCOMES OF STRESS

Apart from depression, there was no real difference in health outcomes between HMCG and BSW. HMCG were found to have ingested more medication in the previous 14 days than BSW. However, given that this study was conducted in the UK in winter time, it is possible that increased medication was due to a prevalence of cold-related symptoms, as the most frequently taken at the time of the study were **painkillers** (n = 85) and **other** medicine (n = 66). Interestingly, although there were no significant differences between physical health measures in comparison to BSW, within the HMCG high stress group, 60% (n = 18) had at least one chronic symptom and 77% (n = 23) had a least one symptom in the previous year. Despite this, and even though there was a significant, negative correlation between work stress and health ($r = -0.30$, $n = 280$, $p \leq 0.001$), none of the HMCG high-stress group had rated their health as **bad** or **very bad**. There is a possibility that their self-perception of health may have been age related.

Finally, whilst high levels of social support appear to have a moderating affect on HMCG as a whole, those with low scores **within** this group were found to be at significantly higher risk from negative outcomes.

The next part of the research will examine the extent to which stress in the coastguard can be accounted for by models such as the job demands-control-support model and the effort-reward imbalance model.

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