GENDER DIFFERENCES OF STRESS IN THE FARMING SECTOR

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Abstract

This article examines gender differences in psychological distress from the impact of stressors. Stress-related illnesses, in particular suicide attempts/successes, are now of major concern in agriculture and attract increased interest from scholars. Many farmers and farm employees have first-hand experience of fatalities, injuries and ill health where stress and fatigue are major contributors. The study was developed through a questionnaire survey, interviews and farm visits. Results from the hierarchical regression models indicated significant gender differences after severity of stressors were taken into account. Male farmers were experienced the impact of psychological strain, whereas the female farmers reported a slightly higher impact of farm stressors. The demographic variables such as marital status, age group, occupational status and size of the farm were not significant factors for contributing toward stressors-strains relationships. This outcome will encourage practitioners who provide services to confront the impact of stressors directly to reduce psychological strain, which likely enhances satisfaction and performance. This research highlights the need to incorporate the frequency and severity of stressors in the work place to understand fully the stressor-strain relationship on individual differences,

Introduction

Stress and fatigue cause high numbers of cases of fatalities, injuries, and ill health among farmers and farm employees. Stress-related illnesses have emerged as a major concern and attract increasing attention among scholars. Farm workers experience hazardous conditions frequently, where they have higher rates of injury and illness in comparison to industrial and service workers (such as teachers and supervisors) in standard employment. Male and older workers were consistently a higher risk group (ACC, 2006; Lovelock & Cryer, 2009).

Farming is a complex way of living that creates stressful life conditions among farmers. For instance, female farmers reported multiple roles in farm work additional off-farm duties which often produce feeling of anxiety and psychological strain. On the other hand, male farmers are more concerned with farm related work, financial concerns, geographical isolation, lack of labour, and viability of the farm (e.g., Alpass et al., 2004). The experience of stress is especially problematic as most farmers who own farms do not employ many staff. In essence, the primary responsibility for running the entire farm and doing the basic work rests on the shoulders of the farmers. However, farm-related policies differ greatly when comparing similar Western farming countries. Increased workloads and working harder amongst New Zealand farmers have come about in part as a result of changes to Government regulations and policies that affect farmers farm work (Alpass, Flett, Humphries, Massey, Morriss, & Long, 2004 for a review). For example, four weeks of annual leave for farm workers according to the Employment Relation Act, 2000. Previous research on farm stressors identifies stressors that are specific to farming and not common to all occupations, for example financial difficulties, administrative and legislative pressures, production fluctuations that affect supply-demand and family problems (Page & Fragar, 2002). Ang, Lamm and Tipples (2008) describe a number of stressors and recurring themes in the analysis of the narrative data relevant to farmers; that include the incidence of government policies and regulations, economic factors, excessive workload and lack of skilled labour. An average of 60 percent of Canadian/Australian/British farmers report psychological and physical symptoms commonly associated with farm stress affecting their mental health (e.g., Booth & Lloyd, 2000; Walker & Walker, 1988; Wallis, Dollard, & Ranzijin, 2003). All studies reported a moderate to high frequency of occurrence symptoms of anxiety, fatigue, loss of temper, forgetfulness, concentration difficulties, back pain, and sleep disruption. The farmers experienced a high level of distress that would justify assistance from

a mental health professional. In addition, the majority of farmers work long hours. For example in Australia, 90 percent worked more than 40 hours per week (Fragar & Franklin, 2000) and in New Zealand 49 percent of self-employed dairy farmers without employees worked more than 60 hours per week (29 percent more than 70 hours per week) (Wilson & Tipples, 2008).

If these environmental stressors persist over time, long-term or chronic undesirable outcomes in the form of psychological strain (Sulksy & Smith, 2005) and ill-health are likely to result (Devereux, Rydstedt, Kelly, Weston, & Buckle, 2004). However, individual responses to work-related stressors depend on the number and strength of the stressors encountered. If the individual views the situation as being irrelevant, little stress occurs.

Selye's stress theories (1976) have been modified with the stress model of Taylor, Klein, Lewis, Gruenewald, Gurung, and Updegraff (2000). This emphasized the importance of biological and behavioral differences between male and female responses to stress. Selye suggested that the fight-and-flight stress response may characterize the primary physiological responses to stress for both males and females. However, Taylor et al. (2000) suggest that behaviorally, females' responses are more marked by a pattern of "tend-and-befriend". The biobehavioral mechanism that underlies the tend-and-befriend pattern appears to draw on the benevolent system and neuroendocrine evidence. Human stress responses among individuals have been characterized, both physiologically and behaviorally, as "fight-or-flight" and "tending and befriending". Thus, understanding Taylor et al. (2000) model's ability to capture additional complexities of gender differences in the farming context may be useful.

Most research on distress amongst the farming community has reported female farmers suffered a higher degree of stress compared with male farmers. For example, more than 50 percent of United States women engaged in farming described symptoms of stress (Berkowitz & Perkins, 1985). Further, Walker & Walker (1987) reported that Canadian male and female farmers experienced different occupational stressors that can lead to a mentally distressed state. Female farmers also report significant higher stress mean scores than male farmers (Schwarzer & Schulz, 2003). Previous findings have been found to be consistent with sex differences reported in farm stress. However, these studies reviewed are very different and therefore it is not possible to identify the differences between men and women.

As the pattern of stress in farming is nearly identical to that seen in previous studies (Firth, Williams, Herbison & McGee 2006; Pollock, Deaville, Gilman, & Willock, 2002; Deary et al., 1997), there is some evidence to suggest that female farmers respond differently to stressors compared to their male counterparts (Ang et al., 2008; Alpass et al., 2004). Although the existence of a gender difference in psychological strain is well established in the literature, the reasons for these gender differences are not clearly understood (Nolen-Hoeksema, 1999; Deary et al., 1997). This study aimed to explore gender differences of psychological strain when female and male respondents report the severity of stressors.

Method

A pilot study with interviews/farm visits was conducted. The pilot study took place through five farming organizations. Their key personnel were provided with the information regarding the proposed survey on New Zealand farm managers. They were also informed that this was a study of the effect of farm stressors as well as an attempt to understand aspects of the farm manager's personality. They could talk about anything that they felt was inappropriate, or that farm managers might refuse to answer. This survey instrument was examined by five volunteer farm managers during the pilot study. One of the questionnaires, "Changes in Common Agricultural Policy", in Deary *et al.'s* (1997) Edinburgh Farming Stress Inventory instrument was deleted. This question was considered inappropriate in New Zealand because the European Union supports (subsidizes) European farming which effectively sets the prices farmers receive. In addition to the questionnaire subjects also provided feedback concerning clarity of instructions, difficulties with the questions, questionnaire length, layout and preferred method for returning the questionnaires. A total of six domains which consisted of 35 items to assess the farm-related stress were identified in the inventory: 1) farming bureaucracy; 2) financial issues; 3) uncontrollable natural forces; 4) time pressures; 5) personal farm hazards; and 6) geographical isolation. The respondents were asked to rate the severity and frequency of occurrence of stressors that might adversely affect their psychological well-being, using a scale 1 to 5 from 'none' to 'very severe', respectively. Some of the questions that respondents answer include, 'bad weather', 'filling in government forms' and 'adjusting to new government regulations and policy'.

The 12 items in the General Health Questionnaire-12, were incorporated into the Edinburgh Farming Stress Inventory, together with additional questions asking for demographic details. These questionnaire were then distributed to 6,000 farmers in the main sample via email and online survey by utilizing the farm organizations' databases. Respondents were assured all information collected was confidential, their privacy protected and no one would be identified in the report.

Overall 1040 individual questionnaires were received giving a total response rate of 17.3 percent. The response consisted of 819 male (80 percent) and 207 female (20 percent) farmers from diverse farming sectors. The data were used to report the demographics statistics of gender, ethnicity, tenure, sickness, region, hours worked, and age. 86 percent of the respondents were farm owners with an average age of 50 years, while 83.4 percent were married. 7.6 percent of farmers were divorced, widowed, defacto, or separated. 6 percent were never married. The average farm size was 370 hectares from all sectors of New Zealand agriculture.

Results

First, the exploratory factor analyses of the psychological strain (General Health Questionnaire-12) and stressors variables (Edinburgh Farming Stress Inventory) were

conducted with SPSS version 18 by factor scores. The relationships of the 12 items were analysed to determine if the model was constructed on a one-factor structure predetermined in the principal-components analysis (Bank, Clegg, Jackson, Kemp, Stafford & Wall, 1980). Since we set a cut-off of 0.40 for inclusion of a variable in the interpretation of a factor, the single-factor structure of GHQ-12 was established. The one factor comprised social dysfunction and anxiety, which together reflected the General Health Questionnaire (Kalliath *et al.*, 2004).

Next, associations among the items in the Edinburgh Farming Stress Inventory were examined using principal components analysis with varimax rotation. This was to determine whether the Edinburgh Farming Stress Inventory construct, reflected by all the 31 items, related to the 6 factors in the same way. The results indicated that the factor structure on the questionnaire used in this study is similar to that found by Deary *et al.* (1997) for UK farmers and Firth *et al.* (2006) for New Zealand dairy farmers.

Overall, the respondents reported a mean score of 1.10 (SD=0.70) which indicate low level of strain. The coefficients for internal consistency for the strain and farming stressors inventory have exceptionally high internal consistency, as measured by Cronbach's Alpha coefficient, which are 0.91 and 0.93 respectively. The correlations of strain-stressors relationship is positively correlated at .46.

Hierarchical multiple regression analyses were performed for the male and female samples to determine the effect the severity of stressors on strain controlling for the effects of frequency of stressors and seven demographic variables. The result of regression analyses is presented in Table 1.

In Model 1, the demographic variables and frequency of stressors were entered in the first step in the regression analyses for male participants. This was done in order to control for the impact of the demographic variables and frequency of stressor on the study variable, strain. Similarly, a second series of hierarchical multiple regression analyses were performed to examine the effects on female sample. This procedure allowed us to identify the significance of strain by gender. Of the control variables, frequency of stressors and number of employees employed at the peak season showed significant effects on both male and female participants.

In Model 2, severity of stressor as an independent variable was entered. The average hours worked showed a significant effect for female participants and with a significant effect for the number of sick days per year for male participants. The effect of female participants on strain turned non-significant with the inclusion of severity of stressor into the Model 2, suggesting that severity of stressor had no effect on female responses to strain. The severity of stressors were positively related to strain among male participants, consistent with the idea that the higher the strain, the higher the impact of severity of farm stressor. The improvement of fit is significant ($p<.001$) for male participants. Hence, the results generally provided broad support for male participants.

Table 1: Hierarchical Multiple Regression Analyses for male and female respondents

	Outcome variable			
	Strain			
Variable	Male (n=807)		Female (n=204)	
	Model 1	Model 2	Model 1	Model 2
Independent Variable				
Severity of stressors		.39***		.25
		(0.07)		(.19)
Control Variable				
Constant	.003	-.23	-1.2*	1.22*
	(.23)	(.23)	(0.57)	(.57)
Frequency of	.44***	.17*	.85***	.66***
stressors	(.05)	(.07)	(.15)	(.21)
Age	-.002	-.001	.005	.003
	(.003)	(.003)	(.01)	(.10)
Sick days/year	.007*	.007*	.003	.002
	(.004)	(.004)	(.007)	(.007)
Average	.002	.001	.001*	.006†
hours worked	(.002)	(.002)	(.001)	(.001)
No. employee	.005*	.005*	-.01*	-.01*
peak season	(.002)	(.002)	(.004)	(.004)
Farm size (hectares)	.000	.000	.000	.000
	(.001)	(.001)	(.001)	(.001)
Age	-.002	-.002	.005	.003
	(.003)	(.003)	(.01)	(.10)
Tenure (years)	-.002	-.002	-.10	-.007
	(.003)	(.002)	(.009)	(.010)
R^2	.412***	.467***	.369***	.384
Adjusted R^2	.157***	.204***	.309***	.316
Change in R^2	.170***	.048***	.369***	.015
N	807	807	204	204
F	13.24***	15.73***	6.183***	5.686***

Note: Standard errors are in parentheses.
º values presented include centred data only.
†p < .10
*p < .05
**p < .01
***p < .001

Further analysis revealed that both male and female farmers experience government bureaucracy (mean =2.58) as high level source of stress in farming, leading to high strain among farmers. On the contrary, isolation was neither a major source of stress for the male or female farmers surveyed. Female farmers reported unpredictable events (mean = 2.59), such as bad weather and market conditions as stressful. However, female reported personal/farm hazards as the highest source of stress in farming. Female farmers reported more stress than did men in almost all domains of farm stressors (see Table 2).

Table 2: Farm Stressors scores

Domains	Male mean (n=804)	Female mean (n=204)
Government Bureaucracy	2.58	2.53
Unpredictable factors	2.46	2.59
Personal Hazards	2.24	2.66
Time Pressure	2.21	2.52
Finance	2.10	2.36
Isolation	1.37	1.56

Discussion

We found that individuals differ in their response to stressors and react affectively in a different manner. The high frequency as well as severity of farming related stressor leads to the higher impact of strain as reported by male respondents. However, this result clearly confirmed the findings of previous studies which showed that higher stressors are related to higher strain. Thus, male respondents suffered higher degree of strain from the impact of higher frequency and severity of stressors. This suggests that male respondents respond differently to stressors in comparison to their female counterparts.

In line with Taylor et al. (2000), this study captured the complexities of the gender differences under conditions of contextual threat, in which female responses to stressors are characterized by a pattern termed "tend-and-befriend". However, the male respondents response to threat are geared towards “fighting or flying” which may not address the adaptive nature of females respondents. In contrast with the social behaviour of females, the males are more unlikely to affiliate in a stressful environment. For example, when confronted with a stressor, a female respondent who lives on an isolated farm will seek social support such as from the organization providing support to reduce distress. Based on the evidence of this study, female farmers are simply more prepared to report the experience of stressors, and thus do not experience strain. On the contrary, a male dairy farm owner said, “We are busy building a new cowshed and calving is just around the corner, stress levels this year will be particularly high, haven’t had a day off since a weekend in early February and will be no day off until after calving, mid to late October if we are lucky”. Farmers are stressed when not enough workers are available or employed to assist them, which increases their workload and time pressures, which have deleterious psychological effects on them. Since the strain levels are not significant among the female farmers, sources of stress may be related to other factors, such as balancing work and family roles (Deary *et al.,* 1997) or personal factors (such as different coping styles or personality traits) (Berkowitz & Perkins, 1984; Walker & Walker, 1987).

Our results suggest that both male and female farmers report moderate to low stressors related to finance, government bureaucracy, unpredictable factors, time pressure, and personal hazards. But these cumulative stressors may prevent farmers from perceiving signs that might identify hazards from the task at hand, thus increasing the risk of injury and psychological problems, including depression, health problems, and workplace accidents (Kidd, Scharf & Veazie, 1996; Quick, Quick, Nelson & Hurrell, 1997). In particular, farmers viewed changes government policies and regulations as the most significant stressors.

However, the present study was based on cross-sectional design which did not allow for the evaluation of causal relationships and third variable influence. In addition, the data were collected during the slowest season of the farming year from a predominantly farming sample and not generalizable to other demographic groups. Since there are peak and low seasons in farming, the findings of this paper could be usefully tested at different seasons of the year when farmers may experience different sources and levels of strain. Also the findings derived from this study are unique to farmers who are members of a farming organization who were willing to participate. The results carry important implications for farming organizations, communities, and government when implementing stress interventions and prevention strategies with a more holistic approach for developing a strategic framework for rural health.

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