Emotional Intelligence and Perceived Stress Among Scientists in Agricultural Research Service

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Emotional intelligence (EI) is one of the important factors that contributes to the success of individuals who assume various tasks and roles in a profession. It is also important in determining how individuals cope with the stress that can potentially limit their emotional relationships and their occupational efficiency. The purpose of this study was to find out the relationship between EI and perceived stress among the scientists in agricultural research service. The data was collected from 238 respondents by administering EI Test (EIT) and Perceived Stress Scale (PSS-10). The results indicated that there were no gender differences with regard to EI. However, females scored higher in 'managing emotions' and 'empathy' , whereas males obtained higher scores in 'motivating oneself'. Perceived stress was found to be higher in females. EI was positively correlated with age and negatively correlated with perceived stress. Since EI can be learned, it is suggested that capacity building programs for agricultural research scientists need to incorporate the competencies associated with EI into their training programs so as to deal with stress more effectively.

Introduction

India has one of the largest agricultural research systems in the world with the biggest pool of scientific personnel in a developing country engaged in research and education in the field of agriculture and allied areas. The research system includes approximately 30,000 scientists and more than 100,000 supporting staff actively engaged in research related to agriculture. The present agricultural research system comprises essentially two main streams, viz., the Indian Council of Agricultural Research (ICAR) at the national level and Agricultural Universities (AUs) at the state level. Besides these two, several other agencies such as the Conventional/General Universities, Scientific Organizations, various Ministries/Departments at the Center, and Private or Voluntary Organizations participate

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directly or indirectly in research activities related to agriculture (Borthakur and Singh, 2013).

Working environment in any organization poses a variety of challenges. These challenges may be self-created or experienced from others. If a person wants to succeed, one must have the ability to respond positively to such challenges. Otherwise, it may lead to emotional disturbances in the form of frustration, anger, anxiety, etc., which in turn affect individual productivity. There is increasing interest in how people process emotionally relevant information and the ability to process it efficiently and accurately can have an effect on an individual's life outcomes such as achieving success at work and their general wellbeing (Salovey and Grewal, 2005; and Brackett *et al.,* 2011).

Emotional Intelligence (EI) is "the ability to monitor one's own and others' feelings and emotions to discriminate among them and to use information to guide one's thinking and actions" (Salovey and Mayer, 1990). The concept of EI was popularized by Goleman (1995) in his book, *Emotional Intelligence: Why It Can Matter More Than IQ*. He described a connection between emotional competencies and prosocial behavior and declared EI is more powerful than Intelligence Quotient (IQ) in predicting success in life.

EI is hypothesized to influence the success with which employees interact with colleagues, the strategies they use to manage conflict and stress and overall job performance (Ashkanasy and Daus, 2005; Lopes *et al.,* 2006a; and Martins *et al*., 2010). Employees with higher EI also received better peer and supervisor ratings of interpersonal facilitation, stress tolerance and leadership potential than those with lower EI (Lopes *et al.*, 2006b).

Stress in general and occupational stress in particular is a fact of modern-day life that seems to have been on the increase. Occupational (job, work or workplace) stress has become one of the most serious health issues in the modern world (Lu *et al*., 2003), as it occurs in any job and is even more present than decades ago (Poloski and Bogdanic, 2008). Occupational stress among working people is drastically increasing worldwide. Stress at workplace has become an integral part of everyday life and is referred to as 'worldwide epidemic' by the World Health Organization (Kayastha *et al*., 2012).

Occupational stress is a psychosocial disorder which is the result of interaction between the worker and his/her work environment (Kumar and Suresh, 2010). If left unidentified, it can cause serious physical and physiological illness to the individual. Occupational stress may occur due to stress factors at the individual level or at the organizational level or at the interface of the two. The degree of stress is related to the intensity of threat and to the beliefs and expectations that an individual believes may be achieved or thwarted (Lazarus and Folkman, 1984). Accurate measurement of psychological stress is essential for better understanding and subsequent management of this malady (Yu and Ho, 2010).

There is an existing research base that links EI with stress management, problem-solving skills, wellbeing and mental health (Ciarrochi *et al.,* 2002). A majority of studies reviewed indicate a relationship between EI, stress, coping strategies and health (Ciarrochi *et al*., 2002; and Pau and Croucher, 2003). For example, Pau and Croucher (2003) found that individuals with high EI suffered less perceived stress and experienced better health and wellbeing. Conversely, those with low EI cope less well with stressor and therefore experience more stress.

Although it is reasonable to expect EI to be related to lowered stress, it is also reasonable to expect individual differences and nature of work in job to affect this relationship (Gohm *et al*., 2005). Research scientists work in a demanding environment to solve scientific/societal problems and often have difficulty in balancing work and family life, which affect their personal and professional performance. Their stress coping strategies depend on their behavioral attributes like EI. Law *et al.* (2008) reported that EI of research and development scientists is a good predictor of job performance beyond the effects of general mental ability. Vratskikh *et al.* (2016) also confirmed the mediatory role of job satisfaction in relationship between EI and job performance. However, information on the relation between EI and stress, as feeling of control, is scarce especially among the people in occupations like agricultural research. Hence, the present study was undertaken with the following objectives:

- To measure the EI and perceived stress among the scientists in agricultural research service.
- To find out the relationship between EI and perceived stress among the scientists in agricultural research service.

Methodology

Sample

The present study was conducted on agricultural research service scientists from Indian Council of Agricultural Research (ICAR) and State Agricultural Universities (SAUs), who participated in various capacity building training programs organized by the National Academy of Agricultural Research Management (NAARM), Hyderabad, India during 2013-16. A total of 238 agricultural research scientists from different states of India participated in this study. They were in the cadre of entry-level scientists (n = 160), senior scientists (n = 45) and principal scientists (n = 33). Among the participants, 75.6% were males (n = 180) and 24.4% were females (n = 58). The age of participants ranged from 24 to 60 years with an average of 35.6 years and standard deviation of 11.82. Their educational levels varied from postgraduation to Ph.D in their respective fields in agriculture and allied subjects.

Measurement Tools

EI Test (EIT) (Sharma, 2011)

The EIT constitutes 60 items from five domains of EI (Goleman, 1995):

1. *Self-Awareness*: Knowing what we are feeling at the moment and using those preferences to guide our decision making; having a realistic assessment of our own abilities and a well-grounded sense of self-confidence.
2. *Managing Emotions*: Handling our emotions so that they facilitate rather than interfere with the task at hand; being conscientious and delaying gratification to pursue goals; and recovering well from emotional distress.
3. *Self-Motivation*: Using our deepest preferences to move and guide us towards our goals, to help us take initiatives and strive to improve, and to persevere in the face of setbacks and frustrations.
4. *Empathy*: Sensing what people are feeling, being able to take their perspective, and cultivating rapport and attunement with a broad diversity of people.
5. *Handling Relationships*: Handling emotions in relationships well and accurately reading social situations and networks; interacting smoothly; using these skills to persuade and lead, negotiate and settle disputes, for cooperation and teamwork.

The response pattern in the scale is of Likert type, i.e., on a five-point continuum from always, most often, occasionally, rarely to never. As all the items are socially acceptable, though positively and negatively stated, the scoring for each statement in the scale is done in descending/ascending order for determining the EI by giving a score of 5 for always, 4 for most often, 3 for occasional, 2 for rarely, 1 for never and reverse for negative items. In this way, the expected scores may range from 60 to 300 with high scores showing high degree of EI and low scores showing low degree of EI.

The Perceived Stress Scale (PSS-10) (Cohen et al., *1983)*

Stress was assessed by Perceived Stress Scale (PSS) which is widely used and has been shown to be valid and reliable (Cohen and Williamson, 1988). The PSS-10 comprises 10 items measured on a five-point Likert scale (0, never, to 4, very often, α = 0.82). It measures the degree to which situations in life are appraised as stressful within a month preceding the completion of the scale. Possible scores range from 0 (no stress) to 40 (high stress). Sample items are: “In the last week, how often had you been upset because of something that happened unexpectedly?” and, “In the past week, how often had you found that you could not cope with all the things that you had to do?”

Procedure

The data was collected from the participants during various capacity building training programs conducted by the academy during 2013-16. EI Test (EIT) and Perceived Stress Scale (PSS) were administered to the participants, after briefly explaining the purpose of these tests. Scoring keys and interpretation norms were provided to find out the level of EI and perceived stress of participants. The researcher personally administered the tools to the participants and collected the data. Tests were scored, tabulated and descriptive statistic indicators were calculated using MS Excel. Pearson's correlations were calculated between the variables.

Results and Discussion

EIT scores of participants (n = 238) varied from 136 to 247 (as minimum and maximum) with an average of 205.9 and standard deviation of 19.1. There were significant gender differences in certain domains of EI. Females had significantly higher mean scores in 'managing emotions' and 'empathy' domains, whereas males had significantly higher scores in 'motivating oneself' compared to the opposite gender. However, the total scores in EI between males (205.5) and females (206.4) were not significant (Table 1).

Table 1: Scores of Emotional Intelligence Test (EIT) of the Participants

Domain	MPS[1]	Males (n = 180)		Females (n = 58)		t-Value
		Mean	SD[2]	Mean	SD	
Self-Awareness	60	38.4	4.33	37.9	3.96	1.68
Managing Emotions	35	20.7	2.82	21.4	2.91	2.73**
Motivating Oneself	70	51.3	4.73	50.5	4.99	2.39*
Empathy	45	29.3	3.82	31.1	3.64	6.27**
Handling Relationships	90	65.8	6.27	65.5	7.21	0.75
Emotional Intelligence	300	205.5	19.81	206.4	18.46	1.37

Note: [1] Maximum Possible Score; [2] Standard Deviation; * $p < 0.05$; and ** $p < 0.01$.

Among the males (n = 180), three participants (1.7%) have below average EI, 159 participants (88.3%) have average EI and 18 participants (10%) have high levels of EI, whereas among the females (n = 58), 50 participants (86.2%) have average EI and eight participants (13.8%) have high levels of EI (Table 2).

PSS scores of participants varied from 4 to 32 (as minimum and maximum) with an average of 23.9 and standard deviation of 6.1. Females have significantly higher perceived stress scores (24.6) compared to the scores of males (23.2) (Table 3).

Among the males (n = 180), 42 participants (23.3%) have low stress, 112 participants (62.3%) have moderate stress and 26 participants (14.4%) have high stress, whereas among the females (n = 58), 10 participants (17.2%) have low stress, 39 participants

Table 2: Distribution of Level of Emotional Intelligence Among the Participants

Level of Emotional Intelligence (EIT Score Range)	Number of Participants	
	Males (%)	Females (%)
Below Average (60-140)	3 (1.7)	–
Average (140-220)	159 (88.3)	50 (86.2)
High (220-300)	18 (10.0)	8 (13.8)

Table 3: Perceived Stress Scale (PSS) Scores of Participants

Gender	Mean (SD)*
Males (n = 180)	23.2 (6.93)
Females (n = 58)	24.6 (5.12)
t-Value	3.94**

Note: * Standard Deviation; and ** $p < 0.01$.

(67.3%) have moderate stress and nine participants (15.5%) have high stress (Table 4).

Pearson's correlation coefficients were calculated to quantify the relationship between different domains of EI with participant's age and perceived stress (Table 5). The data indicated that EI is significantly correlated with age. Among the domains of EI, 'self-awareness' and 'motivating oneself' have significantly positively correlated with the age of the participants. Perceived stress was negatively correlated

Table 4: Distribution of Level of Perceived Stress Among the Participants

Level of Perceived Stress (Stress Score Range)	Number of Participants	
	Males (%)	Females (%)
Low stress (0-13)	42 (23.3)	10 (17.2)
Moderate stress (14-26)	112 (62.3)	39 (67.3)
High stress (27-40)	26 (14.4)	9 (15.5)

Table 5: Pearson Correlation Coefficients Between Emotional Intelligence and Age/ Perceived Stress Scores of Participants

Variable	Age	Perceived Stress
Emotional Intelligence	0.263**	–0.235*
Self-Awareness	0.284**	–0.167
Managing Emotions	0.158	–0.269**
Motivating Oneself	0.250*	–0.126
Empathy	0.180	–0.121
Handling Relationships	0.117	–0.142

Note: * $p < 0.05$; and ** $p < 0.01$.

with EI. Among the EI domains, 'managing emotions' is significantly negatively correlated with the perceived stress of participants.

Emotional information is one of the primary forms of information which communicates the state of basic feelings from one individual to another and EI is an intelligence that has to do with discerning and understanding emotional information (Mayer and Salovey, 1997). The findings of this study revealed that female research scientists have higher EI in the domains of 'managing emotions' and 'empathy', whereas male research scientists have higher scores in 'motivating oneself' (Table 1). Higher percent of males (90%) recorded 'average' to 'below average' level of EI, compared to 86.2% of females under the category of 'average' level of EI. However, more percent of females (13.8%) recorded 'higher' level of EI compared to males (10%) (Table 2).

Traditionally, across all cultures, women are considered to be more emotional than men and they possess an inherent ability to recognize, understand and feel the emotions of others. Girls and boys are nurtured differently by their parents. Furthermore, girl child starts talking earlier than boys, which means they are more adept at expressing their feelings and developing greater verbal expertise. Hence, girls have more knowledge of the emotional world, but boys do not receive such education and are naïve in expressing their feelings and understanding the emotions of others (Brody and Hall, 1993; and Fivush *et al*., 2000). Previous studies also revealed that the EI scores of women were significantly higher than men (Petrides and Furnham, 2000; and Brackett *et al*., 2003).

In the present study, female research scientists are found to have higher perceived stress than their male counterparts (Table 3). Higher percentage of males (23.3%) reported 'low' level of perceived stress than females (17.2%), whereas higher percentage of females reported 'moderate' to 'high' level of perceived stress than the males (Table 4). This high level of stress may be attributed to individual differences in EI. The participants who scored high on EI are better at managing the emotions evoked by the demands of their occupations and therefore, experienced less stress. Chawla *et al.* (2014) studied perceived stress of different occupational streams and concluded that the mean PSS scores were higher in housewives as compared to other occupational categories. Viljoen and Rothmann (2009) found that work overload, control, job aspects, work-life balance and pay were the main factors which cause occupational stress. Jitna *et al*. (2011) reported that EI of nursing students was positively related to wellbeing, problem-focused coping and perceived competency, and negatively related to perceived stress. In the present study also, EI is found to be negatively related with perceived stress and is positively related with age (Table 5). Brackett *et al*. (2011) also reported that EI develops with age and experience and can be taught and developed.

Conclusion

From the findings of the present study, it was concluded that perceived stress is higher

in female scientists compared to male scientists. Similar gender differences were not found with regard to EI. However, EI was found to be negatively related with perceived stress. The findings have an important implication for assessing the training needs of agricultural research service scientists. The direct association between EI and low stress of participants may support the value of training on EI, as it is reported to be a learned capability (Horton-Deutsch and Sherwood, 2008). Increased feelings of control and emotional competence assist them to adopt active and effective coping strategies when dealing with stress, which in turn enhances their subjective wellbeing. Capacity building for agricultural research scientists needs to incorporate the competencies associated with EI into their training programs so as to deal with stress more effectively and ultimately the scientists would be able to contribute better for the society.

Future Research: Future studies should focus on detailed analysis of the causes of actual stress experienced by the research scientists in the system. Factors such as organizational climate, stimulating scientific working environment, job satisfaction, team-work and interpersonal relationships at the workplace and promotional policies which are important for scientific productivity should be investigated while understanding the emotional and stress-related aspects. The impact of EI training on stress management and improving the work-life balance should be investigated, so as to improve the productivity and quality of research.

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