

STRESS AMONG FOREST PERSONNEL: A META-SYNTHESIS

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Abstract: *Though the field of stress has gained a lot importance in the last few decades, stress studies in the forestry sector are still on cross roads. Looking at the dearth of studies in the field of stress in forestry sector, this paper directs at reviewing the researches about the prevalent stress among the forest personnel. The study encompassed comprehensive review and analysis of physiological as well as psychological stress. A systematic review and meta-synthesis of stress studies was done. The studies met the eligibility criteria only if it had included stress as one of the measures directly or referred to the same indirectly in relation to measured variable in the article by last 50 years. A total of 19 studies/articles dealing with the stress among forestry staff were included in the present study. Both qualitative as well as quantitative analysis were incorporated in the study. The qualitative analysis was directed towards analysing the paper in terms of various methodologies adopted by the researchers and causes and effects of stress assessed. Further, quantitative analysis was conducted by assessing effect-sizes taking due consideration of methodological approach, source and practical significance of selected studies. The paper concludes with a note on importance and gap in stress related studies pertaining to forestry sector.*

Keywords: *Stress, Forestry, Meta-Synthesis, Physiological Stress, Psychological Stress*

INTRODUCTION

Stress has grabbed maximum attention of researchers in the varied fields. Due to the complex life patterns, stress has turned out to be an omnipresent phenomenon. For the last six decades, lots of information on stress and its related dimensions have been made available by various researchers starting with Selye (1936, 1955, 1956, 1976, 1991). But “the concept of stress suffers from the mixed blessing of being too well-known and too little understood” (Selye, 1983). Stress research has been conducted among all known professions but still there remain certain occupational groups, like employees of forestry sector, which have received negligible attention by researchers.

In this line, present study attempts to understand the present status of stress among forest employees as assessed by researchers and suggesting a future course of action for its management using meta-synthesis technique.

Stress

There are three classes of stress; as a response, as a stimulus and as an intervening variable (Cox, 1978). It is however, natural and healthy to maintain optimal levels of stress where success, achievement, higher productivity and effectiveness call for certain amount of stress. When stressors are left

unchecked and unmanaged for longer duration they create problems in performance and affect the health and well-being of the organism (Pestonjee, 1987).

Historically, stress was considered as an effect but now it is also perceived that stressful life events can function as both cause and effect (Cohen & Edwards, 1989; Epstein & Katz, 1992). Holmes and Rahe (1967), in their Life-Events theory, suggest that stress occurs when the situation requires more resources than are available. Thus, stress, as an area of study, has covered almost every area ranging from students to professionals to non-working class.

Additionally, during the past decade, a stress related phenomena known as burnout has received increasing theoretical and research attention, and, burnout is found to be deteriorating the performance of an organisation as the most dedicated and idealistic members of a profession may be most susceptible to burnout once they begin to fall victim to the chronic stress they experience on the job (Pines & Aronson, 1981).

Stress in forestry sector

In general the environment of forest has been considered as a stress-buster (Hansmann, Hug & Seeland, 2007). However, in the context of foresters which includes forest protection as well as forest industrial staff, stress buster stimulant i.e., forest, acquires the shape of stressor. The resulting stress of

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stressors further leads to psychosomatic health-concerns and burnout (Rishi, Upadhyay & Solanki, 2004). Majority of the research conducted in the field of forestry revolves around flora and fauna. Thus, work-life and stress patterns of forest personnel along with the adopted coping strategies promises a wide area to be explored.

In this regard, the present study is an attempt to analyse published studies in the field of stress and coping in forestry sector. The study attempts to examine the impact along with the methodologies adopted by the researchers using the meta-synthesis technique.

Present paper can be divided into four sections. The first one deals with stress in general and stress in forests. Second section focuses on the method and procedures used by researchers. Analysis of papers in terms of instruments and designs used by researchers, factors and outputs as quoted by them and effect size reporting is done in the third section. Finally, on the basis of analysis part the last section suggests strategies to address the issue and future course of action in the field.

METHODOLOGY

Selection of papers

The study has used various articles published in the field of stress in forest sector to satisfy the objectives as described earlier. A total of 19 papers have been selected as the sample of study addressing the issue of stress among forest personnel. The time period criterion was left open to lessen the impact of constraint of paper availability in the concerned area. This has been done with the view that less number of papers are published in the field of stress among forest personnel.

To get potent research studies and articles, both electronic as well as print data base were searched. Relevant studies were thus identified through surfing the sources like EBSCO, Google scholar, J-gate, JSTOR, Mendeley, Pubmed, Science direct, using the time period limit by the last fifty years up to 2012. The script 'stress and forests' was taken as the major keyword. Further, the literature search was replicated with additional terms such as work-disorders, job-stress, burnout, psycho-social factors, and job-control, in context of forest employees so as to look out for other relevant studies of interest. Relevant literature was also searched by referring to the reference and discussion section of the available literature. The strategy of contacting the authors and co-authors was also adopted where the articles were not easily accessible. This effort turned out to be fruitful as majority of the authors provided their papers and other relevant links.

Techniques

Meta-synthesis is a technique to 'create a holistic interpretation'. It analyses and interprets theory, methodology and

quantitative section of the selected papers. Thus, it integrates all the findings related to a paper at a single platform (Jensen & Allen, 1996).

With this, it was assumed that meta-synthesis approach would be most suitable and viable technique for the present study. It involved three sections, meta-method (section dealing with methodology part, i.e., research design and techniques used in data collection), meta-analysis (section dealing with outcomes of the studies), and effect-size reporting.

The research design of the present research is exploratory, i.e., surveying of concerned literature. The previous studies have been studied and analysed in depth both in qualitative as well as in quantitative manner.

The study was conducted using the meta-synthesis approach. It comprises of three sections: meta-method, meta-analysis and effect-size assessment. Impact factor of journals, in which the studies were published, was also taken as a criterion of assessing the significance of studies. Results are presented in the subsequent sections.

RESULTS AND DISCUSSION

The categorization of selected papers on the basis of regions revealed that seven studies were conducted in the settings of Finland region and addressed both psychological and physiological stress. Further, three studies took place in Zimbabwe that studied physiological stress among foresters using experimental design. In the same line, two studies dealt with physiological stress relating musculoskeletal symptoms amongst French forest machine operators. Besides, in one of the related study, French and Norwegian operators were compared in terms of working conditions and resulting stress. One study each was directed towards forest personnel in Croatia, India, Iran and Greece. In Indian, Iranian and Croatian studies psychological stress among foresters have been examined. However, Greek study among forest workers focuses on stress in relation to musculoskeletal disorders. Finally, one study taken for present analysis deals with mental stress, work-organisation constructs, spread in six countries (France, Germany, Norway, Poland, Sweden, and UK).

Target of study

Two studies out of 19 selected papers (see Appendix 1 for complete reference), selected forestry experts and officers as their samples. However, eleven assumed forest machine operators and workers as more stressed group and devoted their study to them. And, six cross-sectional studies encompassed both the workers and administrators and compared them on stress levels.

The details of selected papers (N=19) is presented in Table 1.

Table 1: Summary Table for selected papers for the study (N=19)

Study	Region	Sample	Research design	Instrument	PS or PH	Journal	Impact Factor
Ahola, Toppinen-Tanner, Huuhtane, Koskinen, andVäänänen, 2009	Finland	F I W (7810)	LS (8-year)	MBI-GS	PS	Journal of Affective Disorders	3.517
Ahola, Väänänen, Koskinen, Kouvonenb, andShiromc, 2010	Finland	F I W (7396)	LS (8-year)	MBI-GS	PS	Journal of Psychosomatic Research	3.296
Gallis, 2006	Greece	FW (78)	ER	SNQ	PH	International Journal of Industrial Ergonomics	1.290
Hagen, Magnus andVetlesen, 1998	Norway	FW (835)	CS	SNQ	PH	Ergonomics	1.409
Hanse and Winkel, 2008	France, Germany, Norway, Poland, Sweden, UK	F M O (358)	CS	EFA	PS	Ergonomics	1.409
Landekić, Martinić, Lovrić andŠporčić, 2011	Croatia	FE (58)	ER	ERI	PS	Collegium Anthropologicum	0.61
Lotfalian, Emadian, Far, Salimi andMoonesi, 2012	Iran	FMO (95)	ER	GHQ	PS	Middle-East Journal of Scientific Research	--
Miranda, Viikari-Juntura, Martikainen, Takala, andRiihimäki, 2001a	Finland	FIW (5180)	LS (1-year)	MNQ	PH	Occupational and Environmental Medicine	3.020
Miranda, Viikari-Juntura, Martikainen, Takala, andRiihimäki, 2001b	Finland	FIW (5180)	CS	MNQ	PH	Scandinavian Journal of Medicine & Science in sports	2.867
Østensvik, Veiersted, Cuchet, Nilsen, Hanse, Carlzon andWinkel, 2008a	Norway, France	FMO (37)	CS	BCR	PH	International Journal of industrial Ergonomics	1.290
Østensvik, Nilsen andVeiersted, 2008b	France	FMO (31)	CS	SEMG	PH	International Journal of Forest Engineering	1.20
Østensvik, Veierstedand Nilsen, 2009	France	FMO, FR (59)	CoS	BCR	PH	Ergonomics	1.409
Rishi et al., 2004	India	FO (34)	ER	PS, RP	PS	Journal of Health Management	0.963
Toppinen-Tanner, Kalimo and Mutanen, 2002	Finland	FIW (713)	LS	OSS	PS	Journal of Organisational behaviour	3.854
Toppinen-Tanner, Ojajärvi, Väänänen, Kalimo andJäppinen, 2005	Finland	FIW (5435)	CS	OSS	PS	Behavioral Medicine	3.104
Toppinen-Tanner, Ahola, Koskinen andVäänänen, 2009	Finland	FIW (7897)	LS	MBI-GS	PS	Stress and Health	1.229
Wästerlund, 1998	Zimbabwe	FW	LR	---	PH	Applied Ergonomics	1.428
Wästerlund, Chaseling andBurstrom, 2001	Zimbabwe	FW (4)	ES	WBGT, PST	PH	Applied Ergonomics	1.428
Wästerlund, and Chaseling, 2004	Zimbabwe	FW (4)	ES	WBGT, PST	PH	Applied Ergonomics	1.428

Note: FIW = Forest industry workers, FW= Forest workers(manual workers, machine operators), FE= forestry experts, FO= forest officers, LS=Longitudinal study, CS= Cross-sectional study, CoS= Cohort study, ER=Exploratory research, ES= Exploratory study, MBI-GS= Maslach Burnout Inventory – General Survey, GHQ= General Health Questionnaire, OSS= Occupational Stress Questionnaire, MNQ= Modified Nordic Questionnaire, SNQ= Standardized Nordic Questionnaire, EFA= Exploratory factor analysis, PS= Type A/B Personality Scale, RP= Role Pics BCR= Borg's Category Ratio, WBGT = Bruel and Kjaer wet-bulb-Globe-Temperature, PST= Polar Sport Tester PE 3000, PH= Physiological Stress, PS=Psychological Stress

Meta-Method

Papers selected for this section were used to analyse the adopted research designs and instruments by the researchers in their course of study about stress among forest personnel. Of the selected studies for meta-analysis, nine of them were focused on psychological stress among foresters.

Research design

Adoption of longitudinal design added authenticity to the collected findings as the phenomenon has been observed over a period of time. Cross-sectional design in the research work has added advantage of comparison of prevailing stress at different locations and job levels. This helped in further analysis of causes if stress increases or vice versa. Exploratory research has been used for in-depth analysis of factors leading to stress and their inter-relation to internal factors (age, sex etc.)

Cross-sectional studies were majorly used by researchers focusing on physiological stress with an objective to compare and contrast factors and circumstances positively or negatively impacting the stress level. Next in the order of usage is experimental method that has been used to measure the degree of relation between heat stress and output (performance) of foresters. Besides, designs like exploratory, follow-up, cohort and literature review were also used.

Instruments of data collection

Studies directed towards measurement of burnout among foresters used standardised instrument of Maslach Burnout Inventory-General Survey (MBI-GS) to measure overall burnout and burnout dimensions. MBI-GS consists of three subscales: exhaustion, cynicism, and professional efficacy. High scores for the first two, and low for the third predicts burnout. To measure stress as an output of imbalance between effort-reward and demand-control, Karasek's Demand-Control Questionnaire & Effort-reward index are also used by researchers. In Karasek's questionnaire, job demand and job control is calculated on parameters such as qualitative, employee, workload, and conflict. Some researchers have also adopted Occupational Stress Questionnaire and Role PICS technique in their methodology of research. GHQ-28 (General Health Questionnaire) was also used to assess anxiety, sleeping disorder, social dysfunction and depression among forest machine operators.

By and by, studies directed towards assessment of inter-relation between musculoskeletal symptoms and stress used Nordic Questionnaire either standardized or modified as per the requirement. Experimental studies for measuring heat stress used scientific instruments like Brüel and Kjaer Wet-

Bulb-Globe-Temperature heat stress monitor type 1219 and Polar sport tester PE 3000 to assess heat stress and heart rate of the forest workers respectively. Borg's Category-Ratio Scale & Surface Electromyography techniques were also incorporated in the studies to meet the specific objective of study.

Meta-Analysis

This section is focused on two major aspects i.e., the causes of prevailing stress and its impact on the foresters. Those groups which are more prone to stress were also identified. Above suggested details are presented in concise manner in Table 2.

Out of the selected studies, burnout and its dimensions (exhaustion, cynicism, professional efficacy), effort-reward imbalance, role stress and work-organisation constructs were focused as factors causing psychological stress. While the papers dealing with physiological stress covered heat stress and musculoskeletal disorders.

Burnout and psychological stress

Burnout and its dimensions, exhaustion, cynicism and lack of professional efficacy cast negative impact over psychological status of forest personnel.

Researchers dealing with burnout and its dimensions reported absence from work place and disability, like mental/behavioural/musculoskeletal/cardio-vascular. Furthermore, extreme cases of burnout was also reported resulting in hospitalisation, and all death due to habitual alcoholism, heart diseases, cancer, and suicide attempt, as the consequences of burnout in the context of stress among forest staff. Authors found cynicism and exhaustion dimensions to be casting more significant impact in the above discussed problems (physiological & psychological). Also, dimensions of burnout (exhaustion, cynicism, lack of professional efficacy) were found to be related to different health hazards. Exhaustion was strongly related to future diseases of the circulatory system, whereas cynicism was strongly related to future diseases of the digestive system. The inter-relation between these dimensions of burnout was also paid attention and it was reported that exhaustion predicts cynicism, and cynicism in turn predicts lack of professional efficacy.

As reported by the studies, upper age group and women were found to be more prone to stress. Women, employees over the age of 55, manual workers, and those with medication or chronic illness were found high on possibility of severe burnout with unmarried workers were found to be falling victim to burnout more than others. However, studies have also suggested that burnout among employees aged 45 or over was not associated with mortality.

Table 2: Stress and its causes among forest personnel

Study	Factors of Stress	Group prone to stress	Causes
Burnout and its dimensions	Aholaet <i>et al.</i> , 2009 Aholaet <i>et al.</i> , 2010 Toppinen-Tanner <i>et al.</i> , 2002 Toppinen-Tanner <i>et al.</i> , 2005 Toppinen-Tanner <i>et al.</i> , 2009	Women Upper age-group Manual workers	Exhaustion Cynicism Lack of professional efficacy
Effort-reward imbalance	Landeki <i>et al.</i> , 2010	Women Managerial level	Disproportionate output to efforts
Role pressure	Hagen <i>et al.</i> , 1998 Rishi <i>et al.</i> , 2004	Type A personality	Political/departmental interference Time-pressures Field visits Increased psychological demands Decreased intellectual discretion
Work-organisation constructs	Hanse <i>et al.</i> , 1998 Lotfalianet <i>et al.</i> , 2012	All groups	Job control Job variation Job satisfaction
Heat stress	Wästerlund <i>et al.</i> , 1997 Wästerlund <i>et al.</i> , 2002 Wästerlund <i>et al.</i> , 2004	Blue collar workers (Manual and machine operators)	Uncomfortable environmental conditions Work overload Fluid consumption
Musculoskeletal disorders	Gallis, 2006 Hagen <i>et al.</i> , 1998 Miranda <i>et al.</i> , 2001a Miranda <i>et al.</i> , 2001b Østensvik <i>et al.</i> , 2008a Østensvik <i>et al.</i> , 2008b Østensvik <i>et al.</i> , 2009	Women, Obese persons, Blue collar workers	Physically strenuous work Working technique Unfavourable working environment (Physical and climatic condition)

In case of cardio-vascular disorders men were found to be on increased risk of hospitalisation than women.

EFFORT-REWARD IMBALANCE AND PSYCHOLOGICAL STRESS

The issue of imbalance between effort and derived output as a factor of stress has also been covered.

The study suggests risk of stress symptoms among 18.97% of the interviewees. The value of E/R-index was studied to be higher than 1.00 indicating relative disproportion of devoted effort and achieved reward.

The risk of stress was found to be growing with the increase in job-complexity and responsibility irrespective of age and gender. But, women accompanying employees at managerial positions (of 21-30 years of experience) were reported to be under stronger mental pressure at workplace.

Role pressure and psychological stress

Psychological stress was also seen as an output of role exerted pressure among forest employees.

Study of Indian forest officers reported stress emerging out of work related hassles followed by political/departmental interference and pressures. Forest-related activities/offences, time pressures and field visits were seen as other stressors affecting the respondents whereas, work-satisfaction, familial support and support system at the work place were found to be stress-buster. However, when work conditions were conducive with good opportunities for work and advancement, pleasant work environment (as forest and greenery are considered to be stress busters), distant boss, less illegal activities in the area the respondents have reported minimum distress and better well-being.

One of the study suggested that increased level of psychological demands combined with a decreased level of intellectual discretion to be associated with an increased prevalence of neck/shoulder disorders.

Other than above discussed factors, role stress was also studied as an outcome of different personality types where forest officers having type A personality were found high on role stress associated with use of avoidance based coping. The study reports that most of the time forest officers tend to use avoidance based coping strategies.

Work organisation constructs and psychological stress

Job constructs such as job control, variation and resulting satisfaction as a factor of stress were also attended by researchers to study their inter-relation with stress level.

Work organisation constructs of six countries (France, Germany, Norway, Poland, Sweden, and United Kingdom) were studied to find facilitative work organisation construct for forest machine operators. Higher job control is noted to be negatively correlated to musculoskeletal symptoms. However, many professionally active years in forestry are found to be leading to increase in musculoskeletal symptoms. Factors variation and job control related significantly to job satisfaction among the forest machine operators. And, job rotation shows the strongest relation to musculoskeletal symptoms among the forest machine operators.

Occupational stress due to excessive workload endangers the health of forest machine operators and eventually makes them physically and mentally ill.

Heat and physiological stress

Three studies dealt with heat stress among foresters out of the selected ones. First one reviewed various researches dealing with the subject of heat stress while the other two studied the impact of heat stress on labour-productive effects and working strategy in relation to fluid consumption.

One of the review of heat stress paper contributed to a comprehensive picture of causes and effects of heat stress among the foresters. Besides, a similar study using the experimental design over forest workers concluded that forest work required a significantly lower percentage of the heart rate reserve at the high fluid consumption level compared with low level. Also, the time taken to perform the work was significantly lower with the consumption of lesser fluid. Moreover, it was found that the fluid consumption level of the previous day had a significant influence on the time taken.

Another study dealing with forest workers reported that forest workers took longer to complete their task when they are on low fluid scheme, however, the effect on the heart rate development varied for the individual workers as the strategies adopted to accommodate the stress inflicted by the low fluid scheme varied for the individual workers.

Musculoskeletal disorders and physiological stress

Some studies focused over musculoskeletal disorders as an output of work stress among the foresters. Greek forest

workers were studied and it was deduced that the highest prevalence ratios were for symptoms involving the hands/wrists, neck, lower back and knees. And these symptoms were found to be influenced by working techniques, work organisations, psycho-social factors and individual characteristics.

Manual workers were noted to be more on the side of low back and neck/ shoulder disorders than administrative workers. Interrelation between physical exertion and musculoskeletal disorders was focused in a study about Finnish forest industry employees and found to be positively related to each other. In another study physical exercise was found to be casting more protective than impairing effects on the shoulders. Also, physically strenuous work (lifting, carrying, pushing, and pulling) was seen as a risk factor for the incidence of shoulder pain.

French and Norwegian forest machine operators were compared and it was elicited that French respondents had fewer complaints and physical signs of disorders compared to their Norwegian colleagues in spite of equal work tasks. The possible factors of such differences are natural permanent slippery and rocky terrain, short lunch period (1/3rd of French operators), and additional attendance to the monitor (forcing the user to stabilize head in order to find the right angle to read the information) during the whole working day by Norwegian machine operators.

Study dealing with forest machine operators driving harvesters (Timberjack and Valmet) and forwarders (Timberjack and Valmet) reported Timberjack harvester operators as having a significantly higher number of SULMA periods with short duration in the right upper trapezius (RUT) and left upper trapezius (LUT) muscles. While, in the right and left extensor digitorum muscles, no differences were found between operators in the Timberjack and Valmet harvesters or forwarders in number of cumulated long SULMA periods.

Age was found to be directly related to musculoskeletal disorder. Sex, Job type, body-mass index, mental stress as well as physical strenuous work and uncomfortable physical postures while working (trunk forward flexed or with a hand above shoulder level) were seen as other major causes. Women, blue collar workers were presented as more prone to neck pain. And, the pain of longer duration (>30 days) increased distinctly with increasing age.

Effect size assessment

Quantitative analysis of selected papers is conducted by measuring their effect size. This part has again separately managed papers dealing with psychological and physiological stress.

Fifth edition of American Psychological Association (2001) publication manual suggests “for the reader to fully understand the importance of your finding, it is always necessary to include some index of effect size or strength of relationship in your results section” (APA, 2001).

In consonance with this, out of 19 selected studies, 15 reported effect size in terms of odds ratio, correlation or significance value. In the studies, where effect size is not reported it was calculated through the usage of basic data (sample size, mean and standard deviation) in the form of standardized mean difference.

The average effect size of studies is presented in Table 3.

Table 3: Effect size table

Type of Stress	Number of papers	Average effect size
Psychological stress	9	1.4356*
Physiological stress	10	1.2853*

*Value lies in large effect size (Cohen, 1988)

As per Cohen (1988) report in reference to power analysis, i.e., effect size up to 0.20 is “small” in magnitude, those around “0.50” are medium, and above 0.50 are “large”. We find all the studies lying in large effect size. Besides, papers dealing with psychological stress are slightly higher in terms of effect-size to those with physiological stress. This seems to suggest that psychological outcomes are more prominent than physiological outcomes.

Wilson and Lipsey (2001) reported that methodological features such as research designs, assessment methods and type of outcomes affect the magnitude of effect size. Most of the studies incorporated standardized instruments in their methods or modified them as per the requirements (with reference to meta-method section) and aided in building larger effect size. Also, analysis of effect size in relation to elicited outputs indicates that in spite of physiological threats to the employees, perceived psychological threat are more common among the forestry employees of both industrial as well as protection cadre. Durlak (2009), in this regard, has suggested evaluating effect size in three contexts, source, i.e., quality of research, which produces the effect, comparison across similar research conditions and practical significance

Assessment of papers on selected parameter suggests the papers to be good, as most of them are published in journals of significant impact factors (with reference to Table 1). All the papers dealing with stress among foresters were found on almost equal footing (in context of effect size, impact factor and outcomes of the study). Thus, the field of stress among forest personnel is of immense importance as stress above a certain level jeopardizes the performance of forest personnel which casts a negative effect over forest and environment management. The present study indicates the same with

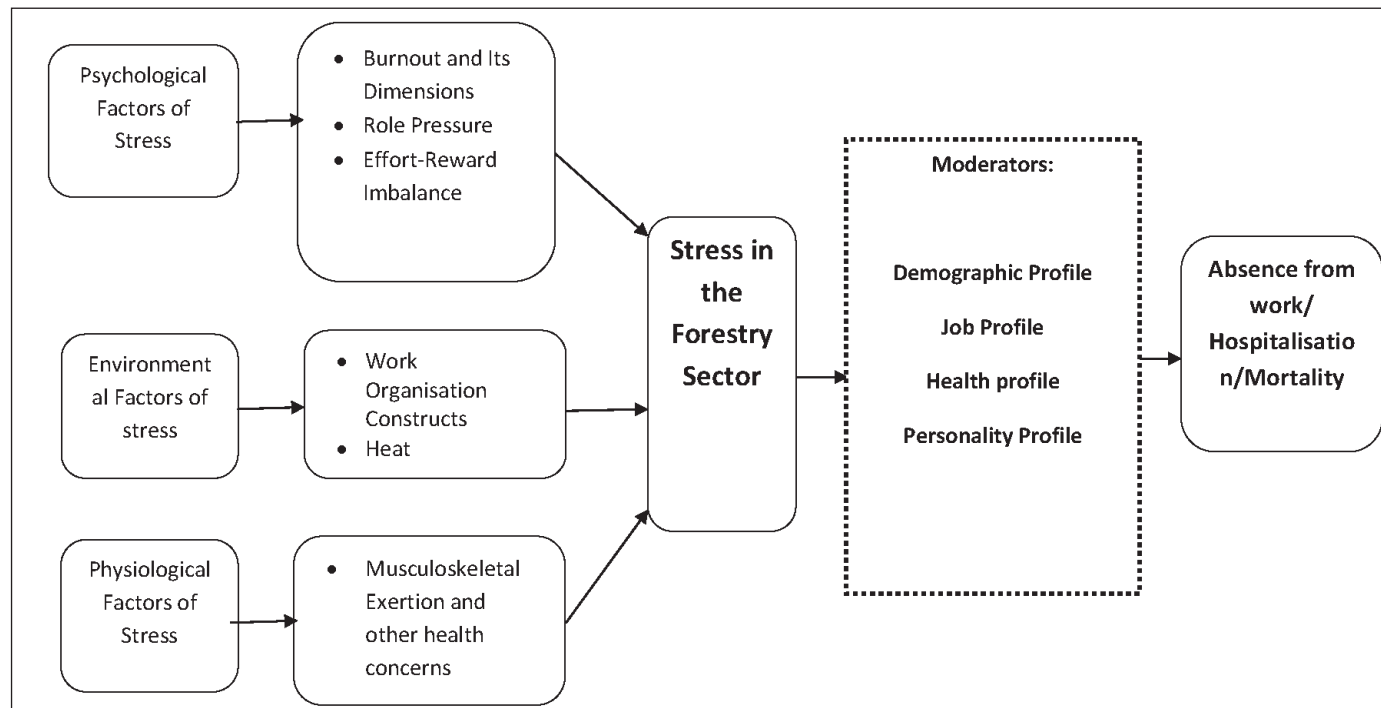
strong conviction.

CONCLUSION

Meta-synthesis of selected papers has indicated that all the papers published using forest sector respondents were almost equal in weightage with respect to studies dealing with physiological and psychological stress. However, the lacunae were found in selection of sample and location of studies. The studies found suitable for the present meta-synthesis were restricted to 11 regions (Croatia, Finland, France, Germany, Greece, India, Norway, Poland, Sweden, UK, and Zimbabwe) only. Other regions also require studies about stress among forest personnel. Further, studies in the selected regions took forest workers and machine operators as their sample (Except Indian and Croatian study) almost neglecting forest conservators and protection staff paving a way for studies including forest protection staff as the main respondents. Also, coping measurements are dealt with in three studies only. One is about Indian forest officers and other two selected Zimbabwean forest workers as their subject of study. Another important aspect, i.e., spill-over effect of stress in terms of interrelation between work life and personal life is not at all studied.

Fig. 1 describes the contributing factors and causes of stress in forestry work domain based on the study of various researches in the field. The figure indicates that psychological factors (e.g., Burnout and Its Dimensions, Effort-Reward Imbalance, and Role Pressure) and physiological factors (e.g., work organisation constructs, and heat) and environmental factors of stress (e.g., and musculoskeletal Exertion and other health concerns) lead to the experience of stress. Besides, the stress is also moderated by demographic factors that may include, age, gender etc. In the same line, the experience of stress also seems to be moderated by factors like Job Profile (e.g., Manual Workers/ Managerial Profile/ Blue collar workers: Manual and Machine operators), Health profile (e.g., Obesity, diabetics etc.), and Personality profile (e.g., Type A Personality) of the forestry staff. The consequence, at large, seems to be absenteeism, hospitalisation, and even mortality (Fig.1).

The present study depicts immense opportunity for organisational, psychological, and sociological researchers to vent into issues pertaining to various aspects of work-life among foresters. However, looking at the present objective, certain gaps have been found in area of stress in forestry sector that requires further enquiry encompassing forest harvesters, forest industrial staff and forest protection staff. Besides, there is a need of studies about spill-over effects and coping strategies to build a plan of action to manage stress for a population that is more responsible towards managing and conservation of environment and forests at one hand and contributing towards low pollution and ecological restoration at the other.

Fig. 1: Causes and Consequences of Stress in Forestry Work Domain

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APPENDIX 1

Published Papers used in Meta-synthesis

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