

**Risk perception in forest utilizations: experimental analysis in the Basilicata forest sites.****D. Cardinale<sup>1</sup>, P. D'Antonio<sup>1</sup>, N. Moretti<sup>1</sup>., Vincenzo Nunzio Scalcione<sup>2</sup>**

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**Abstract:** The present legal framework for the protection of health and safety in the workplace, established by Legislative Decree 81/2008, has identified the “work-related stress” as one of the risks to be assessed, according to the contents of European Agreement of 8 October 2004, and the importance of its management.

The present analysis deals with an important subject as the workplace safety, in particular the risk perception and the work-related stress of the operators in the agro-forestry sector.

The sampling plan was based on the delivery of structured questionnaire (n= 378, 171 women and 207 men).

Results showed that the accident and safety sector cannot be and should not be considered only as a repressive instrument to identify specific violations or responsibilities to be punished. It must instead be considered as a tool for better identifying measures and strategies to eliminate or to minimise the risk perception and the work – related stress in the same or in a similar working environment.

**Keywords:** Injuries, Risk perception, Occupational, forest utilizations

**Introduction**

The issue related to the perception of risk factors represents a fundamental factor for the prevention of injuries: in this research the theme is tackled by applying the study to workers who share work and risk paths within the agro-forestry sites of the Lucan area.

The work of the primary sector is an activity in which, in addition to the traditional professional risks, there are those that derive from a more accentuated specialization, from the use of sophisticated machines, from the nature of the territory and from the occasional use of toxic products.

Implementing effective accident prevention strategies in the workplace therefore requires effective action on workers' perception and risk appetite.

Above all the present work aims to provide a correct definition of perception and risk appetite, as well as of the factors that act in a functional and dysfunctional way on them.

**Methods*****Study design***

In the past decades, there has been an increase in the number of studies focusing on the occupational injury, in particular, the agro-forestry sector is one of the most affected by occupational injury. However, few studies were conducted on this important public health issue.

The aim of the present study was to identify possible psychosocial risk indicators not only on an individual basis, but in order to highlight a situation of possible anomalies in the specific

sector. In particular, our purpose was to identify any situations of distress localized by area and subsequently highlight improvement actions for reducing the risks.

Seven districts (Vulture-Melfese, Val D'Agri, Metapontino, Marmo-Platano-Melandro, Lagonegrese-Pollino, and Collina Materana-Basento-Bradano-Camastra) in the Province of Potenza (South of Italy) were selected.

Data were collected by administering a structured questionnaire to sector operators between March and December 2015. A total of 378 sector operators (171 women and 207 men) were interviewed.

The raw data were subjected to principal component analysis in the context of multivariate statistics to simplify the source data and finally applied structural equations model to analyze the interrelations existing between latent variables.

## **Instruments**

### **Questionnaire**

Data were obtained by interviewing workers in an anonymous way. They talked about their personal experience, thus measuring their level of perception in relation to their safety conditions, highlighting valuable points and bringing out the possible areas for improvement in the company policy on safety at work.

The questionnaire contained detailed information on demographic characteristics, self-perceived health status, annual family income, self-perceived stress, psychological status, personal demographics included age, gender, marital status, education, corporate position, average annual income for family, and type of recruitment.

Education was classified in five groups (primary school or illiterate, junior high school, high school, three-year degree and master degree).

Marital status was classified into four groups (never married, married, divorced and widowed). The corporate position was divided into four groups (process worker, skilled worker and foreman).

Average annual income for family was divided into six groups (less than 5000 euros, 5000 to 10000 euros, 10000 to 20000 euros, 20000 to 30000 euros, 30000 to 40000 euros and more than 40000 euros).

The employment contract was divided into six groups (open-ended contract, fixed-term contract, coordinated and continuing collaboration, agency workers and on-call contract).

### **Data analysis**

Data were analysed by descriptive statistics, parametric and non-parametric statistics, cluster analysis, etc.

Averages, standard deviations percentage distribution to define the composition of the sample and Cronbach's alpha coefficients were calculated for the individual items of the Indicator questionnaire and verified the translatability in the HSE scales areas. Univariate and multivariate statistics (ANOVA and MANOVA) were calculated to determine the possible difference between the groups and the Pearson's correlation coefficient method was used to evaluate the linear relationship between the dimensions of the Indicator Questionnaire to then identify possible risk constellations through declustering analysis iterative K-mean algorithm. The analyses were conducted using a K-medium iterative algorithm clustering. The initial cluster starts from a priori a priori fixed to contrast at most the measurement of the evolutionary



people, is due to a lesser awareness of the consequences that certain attitudes may have, since it would entail a change in one's lifestyle.

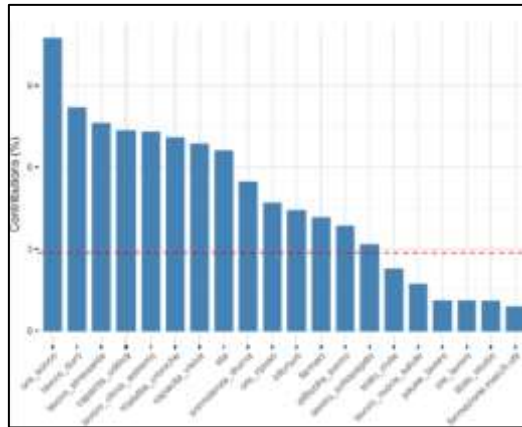


Figure 2 Contribution of variables to Dim-1

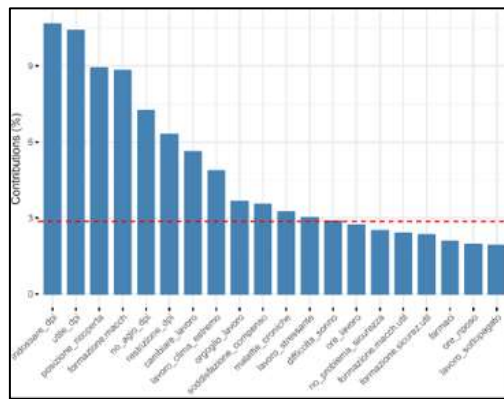


Figure 3 Contribution of variables to Dim-2

The figures (2 and 3) showed the contributions of the variables relating to the first two components extracted, greater than 0.3% which affected the first and second component.

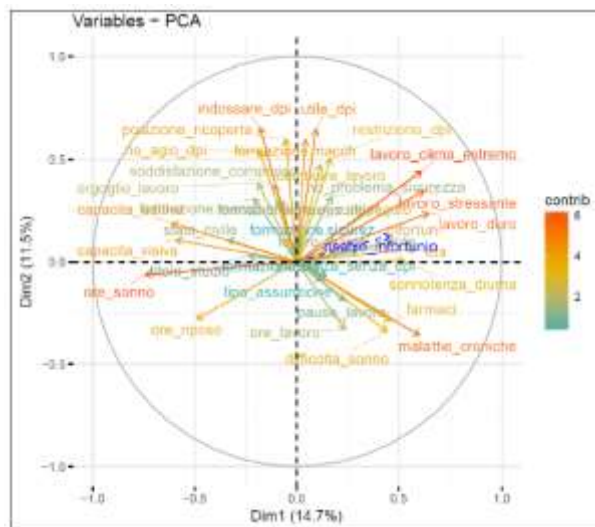


Figure 4 Contribution of variables in PCA

The figure4 shows the contribution of the individual variables within the PCA, in this case the risk of injury is negatively linked to the variables in red that contribute more significantly.

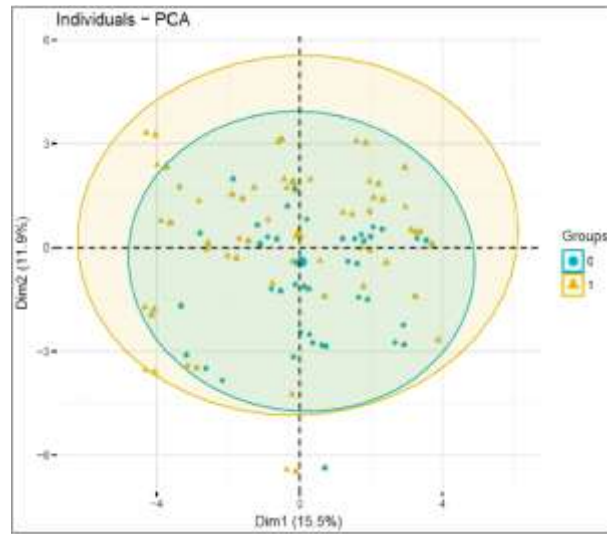


Figure 5 Individuals PCA

By analysing the figure 5 it can be hypothesized that there could be some differences regarding the variable sex of the interviewees, but from how it is shown in the figure there were no significant differences.

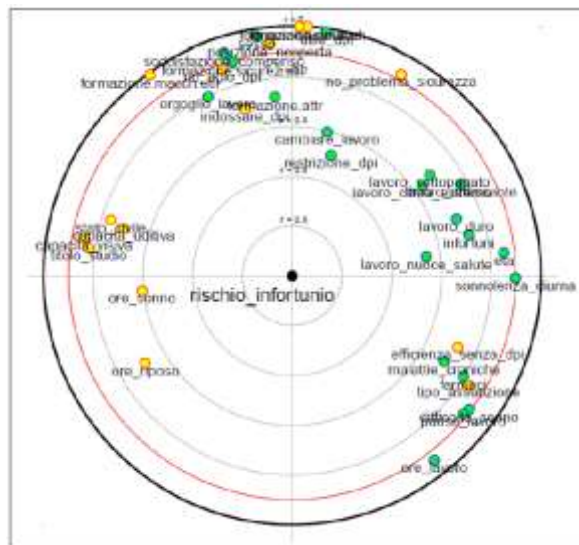


Figure 6Focus PCA

The figure 6 was centered on the variable risk of injury, obtaining the same axes where the correlations were made explicit, where the accident risk was positively linked to the variables in green and negatively linked to the variables in yellow, the result can be interpreted as a PCA for which every variable exposed in opposing axes to each other are negatively correlated, among these we chose sleep hours, hearing ability, (those that exceeded the correlation threshold) to create a model of structural equation.

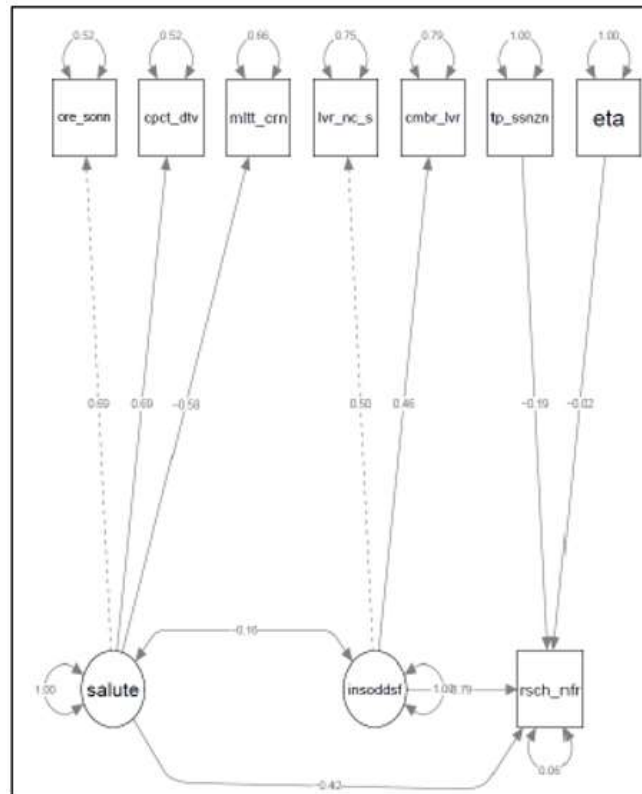


Figure 7 Structural evaluation model

In the figure 7 it was assumed that the perception of the risk linked to the accident is influenced by some measurable / manifest variables, in our case as the variable "age and type of recruitment". The direct variables were the variables relating to the worker's experience, the more the worker was an expert, the less he will be exposed to an accident, therefore the less he will negatively perceive the risk of accidents. The two measured variables related to the experience were: "age and type of recruitment", as age leads to gaining experience in the field and in the use of certain equipment not hurting.

Regarding the type of recruitment, since in the case examined there were temporary and permanent workers, so we would have experienced and less experienced workers.

Another latent variable is the "health" which is also not measurable but deducible / related to other measured variables, in the case examined the hours of sleep (it is known that sleeping seven hours a day is good for health, on the other hand sleeping little lowers levels of attention in the operator).

As well as hearing ability (understood as perceiving a moment of risk or maintaining balance) and chronic diseases (which involve an effect on the physical and mental state of the person). Another latent variable is the level of dissatisfaction in carrying out one's work, inferred from the scores given in the questionnaire as work is detrimental to health and the willingness to change jobs.

The psychic well-being of a person can be measured by his or her degree of satisfaction and dissatisfaction with the person (the degree of satisfaction in carrying out this work), therefore the psychic well-being of a person within a day is given by the "mental well-being in the moment and in the places where it is located", in the specific case of the workplace the psychic well-being of the operator is given by the pleasure of performing one's job, the pleasure of working with one's colleagues, of working in a relaxed way, the non-working outside in



favourable weather conditions, psychologically all this series of factors help the operator to carry out his job.

In the workplace, psychophysical well-being can be measured by means of measured variables (eg the degree of dissatisfaction of the operator is positively linked to the perception that work does not harm health, on the contrary, going to work knowing that I have to work in an extreme climate can I lead in the long run to a debilitating state that can harm my health, thus prejudicing my mental well-being), at the same time the degree of dissatisfaction of the operator is given by the will to change jobs (perceive a low salary, work in extreme climate).

The need to change jobs and as it results from the Focus PCA, to perceive a low salary, the fact that work harms health, work in extreme climate, are positively linked to the degree of dissatisfaction of the worker, therefore the more dissatisfied the more the perception of the risk incurred in the workplace to suffer an accident increases.

### **Discussion**

The activities carried out concern the detection of the psychosocial conditions of operators in the forest sector through a questionnaire.

The results of the research showed that the perception of risk is influenced by some variables, such as age and type of employment.

With regard to age, there is a higher incidence of injuries among the younger working population than the older one. This phenomenon is not always due to inattention or impulsiveness, but rather, more frequently, to little professional experience. The low propensity to adopt safe behaviours in the workplace by young people is due to a lower awareness of the consequences that certain attitudes may have, since they would entail a change in one's lifestyle.

A further influence is given by the type of employment or the type of employment contract, since this variable is an index of the experience gained and the knowledge possessed, first it emerges that workers with non-decision-making tasks would be more prone to accidents than workers with greater responsibilities and with higher duties.

Even contractual differences influence the perception of the risk of each worker. Those with a temporary or "atypical" contract tend to have a low consideration of the risks associated with their work.

Structured workers, on the other hand, appear to have a greater perception of risk and tend to maintain higher levels of attention.

This work analyzed a specific part of the accident phenomenon as a whole, specifically in the organizational and behavioural context.

The analysis showed that the accident and safety sector cannot and should not be considered only as an instrument of repression, which aims to identify specific violations or responsibilities to be punished, but it must be considered as the instrument of investigation which, in seeking causes and responsibilities, aims to identify measures and strategies aimed at eliminating or at least reducing the phenomenon to a minimum, in the same or another, similar, work context.

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