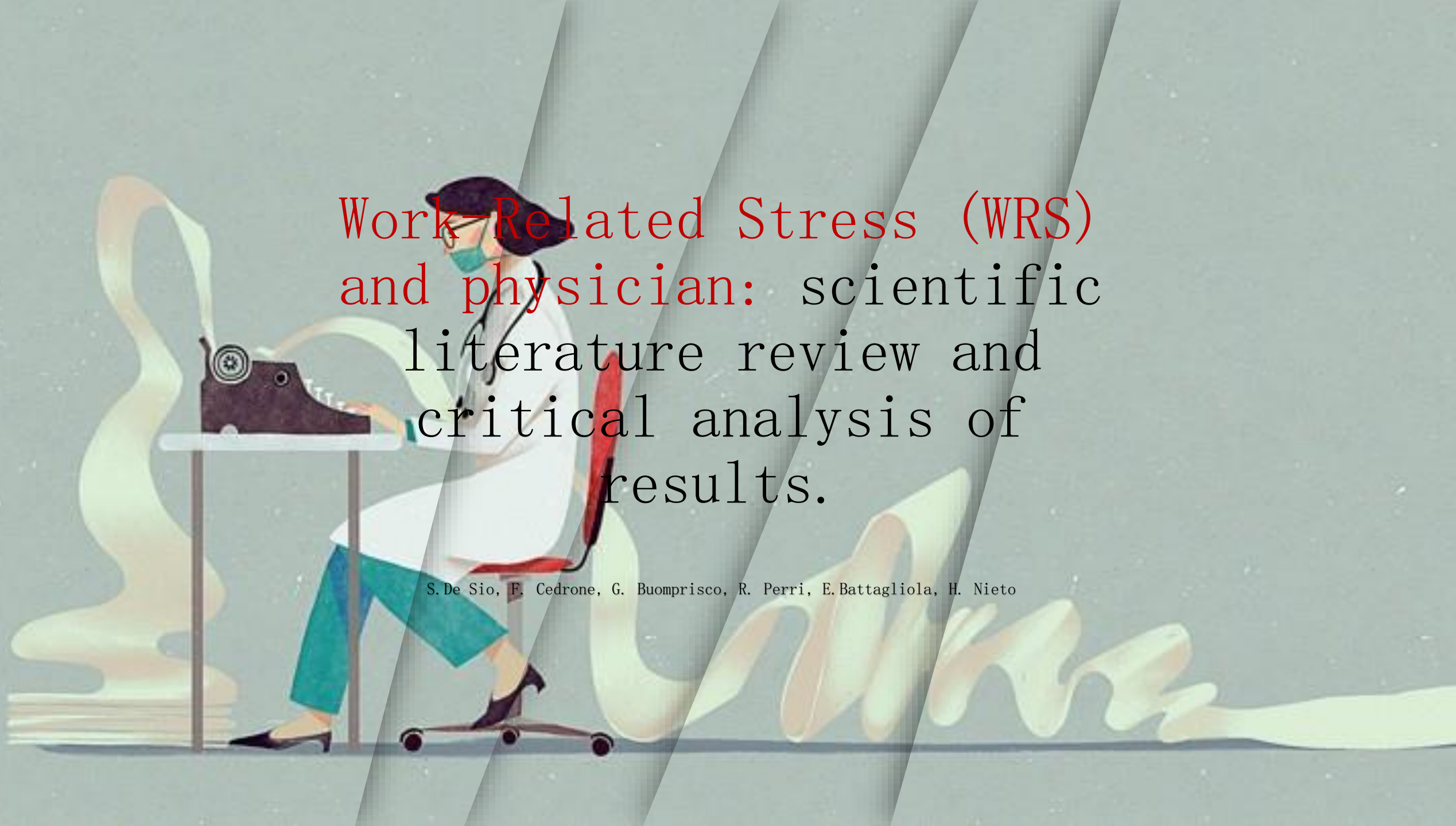

Work-Related Stress (WRS) and physician: scientific literature review and critical analysis of results.

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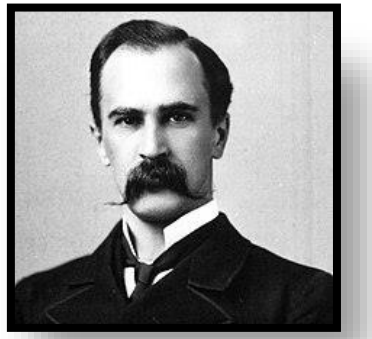
What is stress?

A brief introduction to the history of stress:



1892

Sir William Osler was one of the earliest to use it as a medical term, with the concept of coronary-prone personality.

1934

Harvard physiologist Walter Cannon first named the fight-or-flight response, the nervous system's sympathetic response to a significant stressor.

1936

Hans Selye gave a new definition of stress, and was the first person to describe the general adaptation syndrome.

1984

Lazarus e Folkman described coping as a mechanism to tackle on personal problems in order to minimize stress. An initial distintion between problem-focused and emotion-focused coping is made.

The three stages of the general adaptation syndrome:

1) Alarm reaction stage:

Activation of the hypothalamic-pituitary-adrenal axis.
The alarm reaction prepares the person to respond to the stressors they are facing: “fight or flight response”

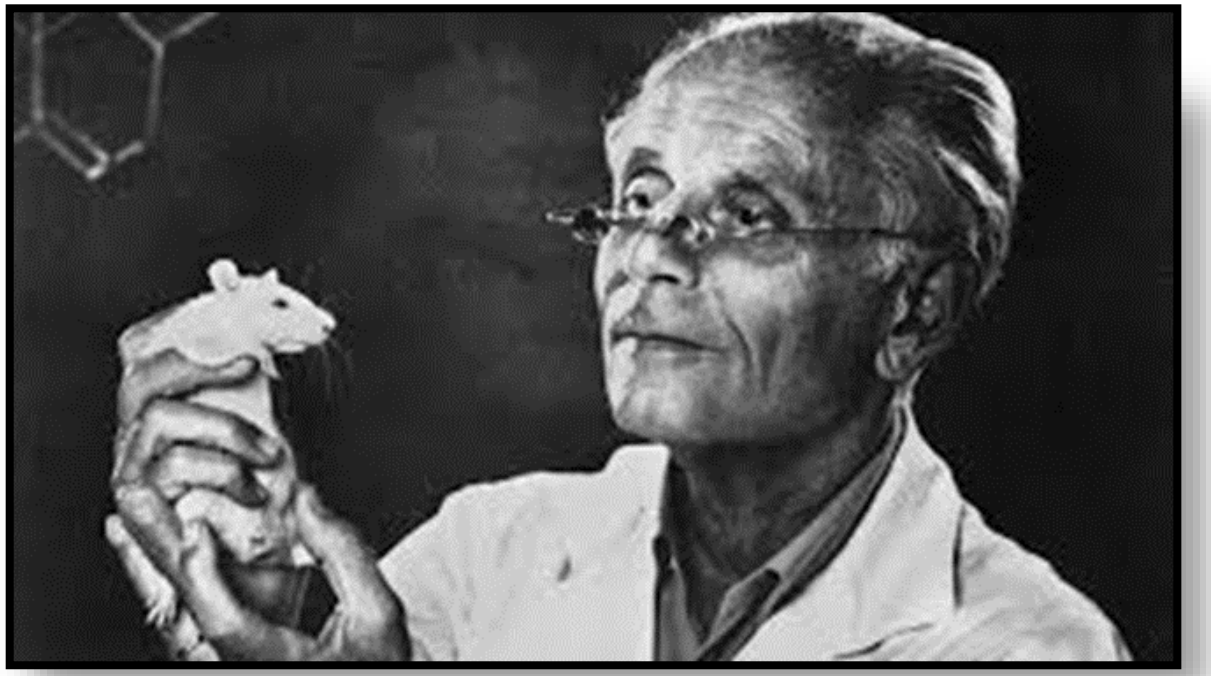
2) Resistance stage:

Cronic stimulation of the hypotalamic-pituitary-adrenal axis. The person begins to use coping strategies, wich may be adaptative (constructive) or maladaptative (negative coping).

3) Exhaustion stage:

Failure of coping mechanisms.
Stress related health conditions!

Stress is the aspecific response of the body to any demand made upon it.



“Every stress leaves an indelible scar, and the organism pays for its survival after a stressful situation by becoming a little older.”

- Hans Selye (1907-1982)

In 1984 Richard S. Lazarus and Susan J. Folkman published "*Stress, appraisal and coping*".

Coping is a conscious effort, to solve personal and interpersonal problems, in order to minimize and tolerate stress.

Two initial forms of coping are described:

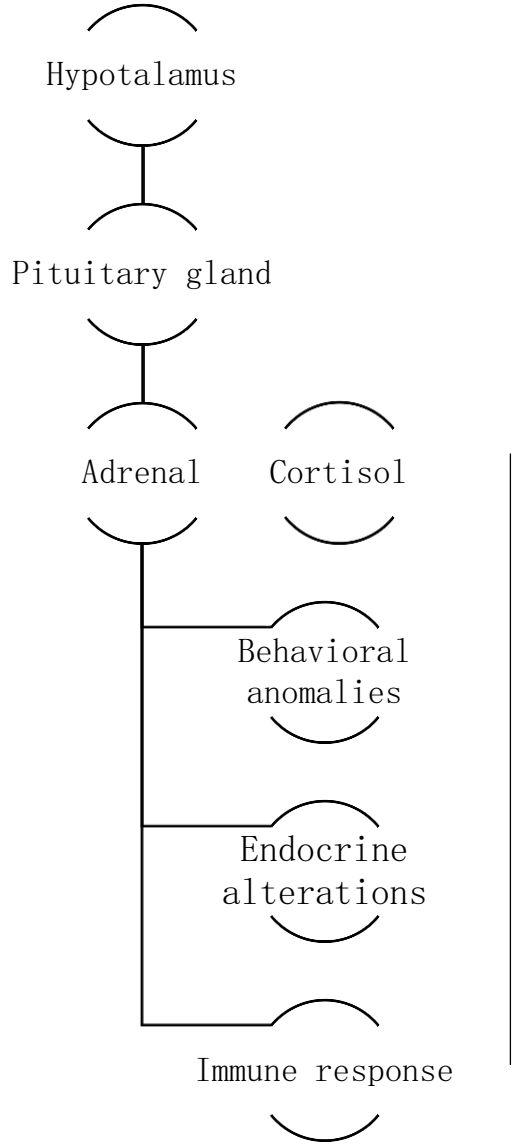
Emotion focused coping:
a stress-management strategy in which a person focuses on regulating his or her negative emotional reactions to a stressor. Rather than taking actions to change the stressor itself, the individual tries to control feelings using a variety of cognitive and behavioral tools.

Problem focused coping:
Problem-focused coping targets the causes of stress in practical ways which tackles the problem or stressful situation that is causing stress, consequently directly reducing the stress.

Eustress and distress

Stress isn’t always negative in fact **eustress**, an acute reaction, may be helpful to overcome challenges, study harder, find creative solutions to problems.

On the other hand **distress** is a cronic phenomenon with systemic adverse effects.



Hypotalamus-pituitary-adrenal axis response to stress stimulates the adrenal gland to produce cortisol with sistemics effects.

Work-related stress

Work-related stress is the response people may have when presented with work demands and pressures that are not matched to their knowledge and abilities and which challenge their ability to cope.

Karasek’s job demand control model

One of the most acknowledged model of occupational stress is the Karasek’s job demand control model. (1979)

In wich the job demands are characterized by:work rate, difficulty, availability and time pressure.

Control on the other hand is intended as the capabilities, the decision making authority and the competence of the worker.

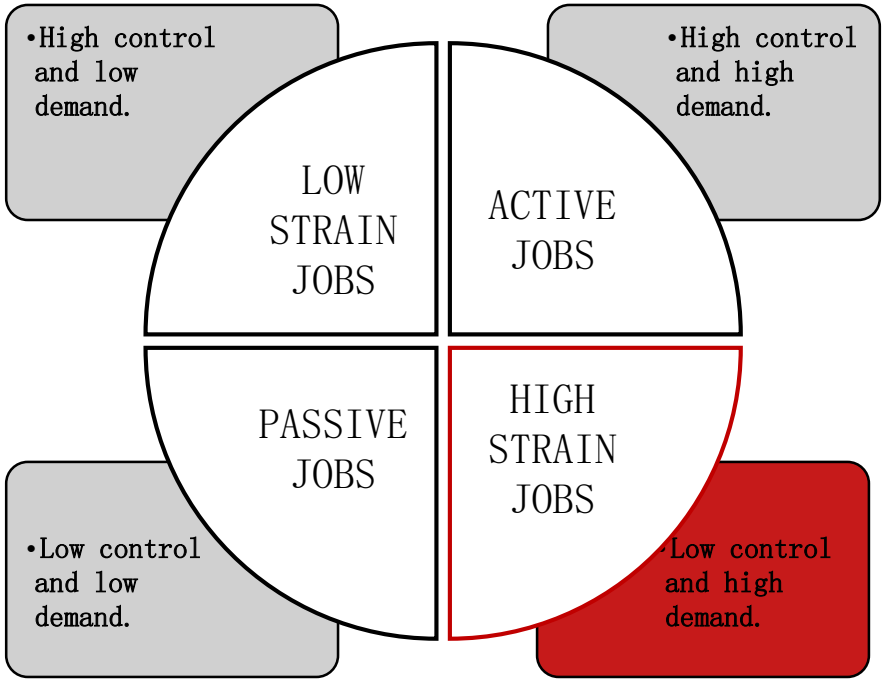
Four categories are identified:
Low strain: no demanding tasks with high control.
Active: demanding tasks with high control.
Passive: low demands and low control.
High strain: demanding tasks with low control.

Workplace social support

Karasek's model was later expanded to consider workplace social support.

Workplace social support is the degree to which individuals perceive that their well-being is valued by supervisors and the organization in which they are embedded and the perception that these sources provide help to support this well-being.

Workplace social support acts as a buffer to the negative effects of high strain jobs.



Stressors in work organization context

- **Enviroment and equipment**: inappropriate maintenance and eligibility of the workspace and equipments.
- **Task planning**: working time, uncertainty about the job.
- **Workload and work rate**: inadequates loads or rates of work.
- **Working time**: long shifts or night shifts.
- **Physical conditions**: inadequate microclimate.
- **Intrinsic factors**: low problem solving capabilities, uncertain objectives.
- **Role in the organization**: ambiguous roles definition.
- **Career development**: low career advancement possibilities.
- **Workplace relations**: between employees and between employers and employees.
- **Work-home interface**: conflict between work and family.

Consequences:

Organizational effects:

Absenteeism.

Poor work performance.

Accidents at work.

Did you know?

The Matrix report (2013) indicate that the total costs of work-related depression in the EU are nearly €620 billion per annum!

Effects on individuals health:

Tachycardia.

Hypertension.

Muscle tension.

Fatigue.

Sleep problems.

Depression.

Anxiety.

Tobacco use and drugs and alcohol misuse.

And many more...

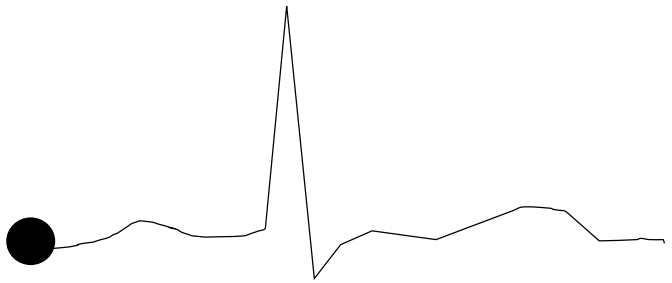
Cardiovascular diseases

There is a great deal of literature focused on stressors and cardiovascular health.

Acute exposition has been studied in natural disasters and in sperimental studies, chronic exposition to stressors is mostly researched in terms of job stress.

Rising of blood pressure, arhythmias, and angina, are common consequences to stress exposure.

These can increase the risks of severe hearth disease.



Depression

Hyperactivation of the HPA axis is the most important reaction to stress. The same hyperactivation can be found in 70% of the patients affected by depression.
Hypercortisolemia can cause toxicity to pyramidal neurons in the hippocampus and can lead to spine loss and atrophy of dendrites, as well as inhibition of neurogenesis in the dentate gyrus of the hippocampus.
Hypercortisolemya may also reduce the volume of hippocampus.
These alterations affect the function of brain areas related to emotion and reward circuitry.

Inflammatory bowel disease (IBD)

Several well designed studies confirmed that adverse life events, chronic stress, and depression increase the likelihood of relapse in patients with quiescent IBD, via the stimulation of the HPA axis and his interactions with the immune system.

This is also supported by numerous studies of animal models of colitis.

Skin disorders:

Recent studies suggest that HPA axis may influence the evolution of atopic dermatitis and other skin disorders impairing the skin barrier function and favoring a shift in immunity toward a T helper type 2 cell/allergic response.

Psychological support and stress-reduction interventions were recently shown to improve patient well-being, and to reduce cutaneous manifestations.

Burnout:

Burnout is a topic of peculiar interest:

Job burnout is a special type of work-related stress, a state of physical or emotional exhaustion that also involves a sense of reduced accomplishment and loss of personal identity.

Although it can affect everyone, it’s most commonly diagnosed in the helping professions such as doctors (especially emergency doctors, psychiatrists, oncologists and intensive care), teachers, social workers, policemen, firefighters and many others.

To evaluate and asses the level of burnout is used the Masalach Burnout Inventory.

Evolution of burnout:

Symptoms are physical such as headache, fatigue, nausea, depression, sleep problems and mental like depression, isolation, paranoia and behavioural alterations.

Apathy

Is the end stage, the subject shows total indifference to his job.

[illegible] the subject may assume behaviours such as absenteeism.

Our work:

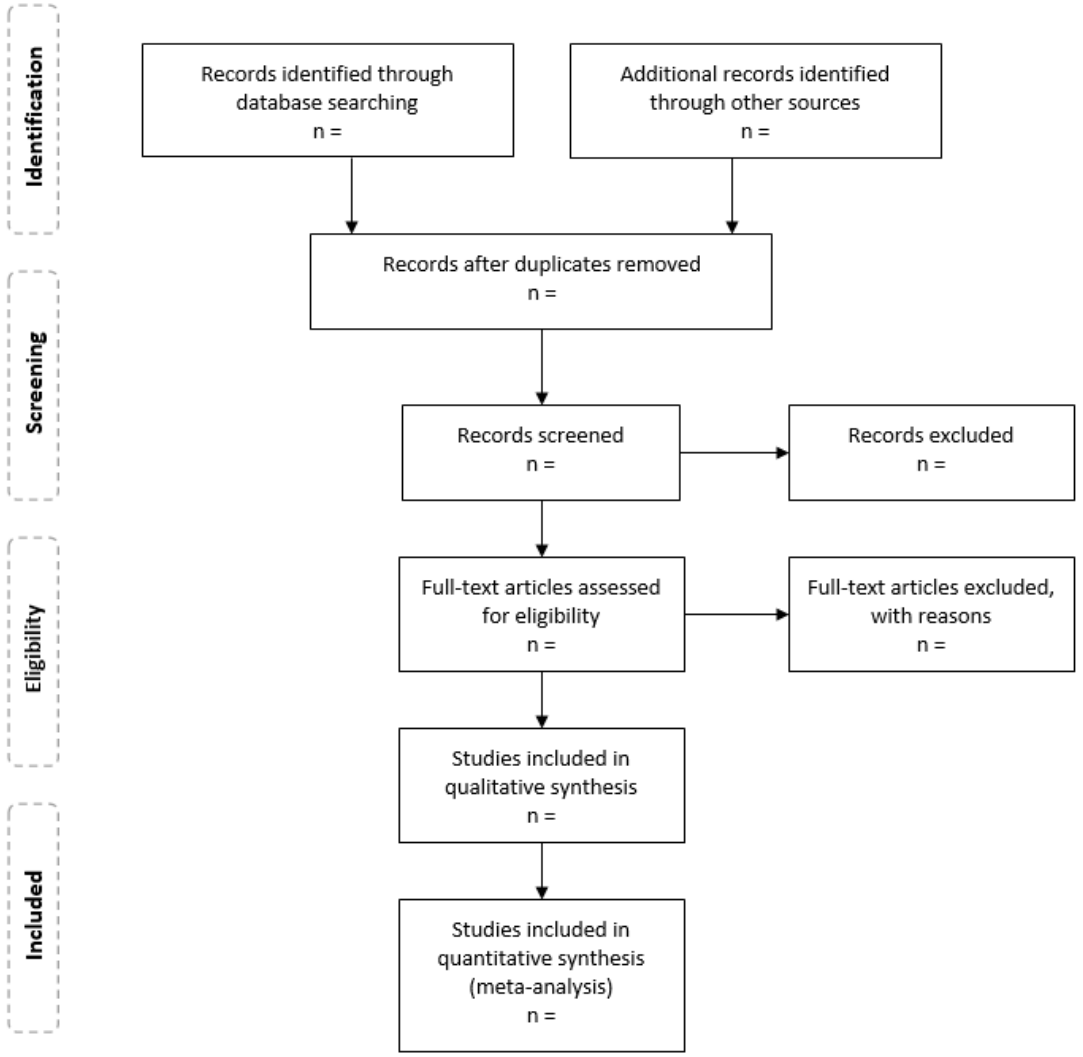
Work-Related Stress (WRS) and physician: scientific literature review and critical analysis of results.

The purpose of the study is to evaluate WRS in physicians, category significantly exposed to psycho-social risk.

Material and methods:

The research was carried out as a systematic review and is coeherent with the terms of the prisma statement.

PRISMA is an evidence-based minimum set of items for reporting in systematic reviews and meta-analyses.
PRISMA includes a 27 items checklist and a 4-phase flow diagaram.



Keywords searched:

- work-related stress
- stress-related disorders,
- psychosocial risk,
- risk assessment,
- occupational medicine,
- job stress assessment,
- test,
- questionnaire,
- evaluation,
- instrument,
- Measurement.

Exclusion criteria:

Only studies regarding physicians were included.

8.911 articles were excluded because they were not related to work-related stress.

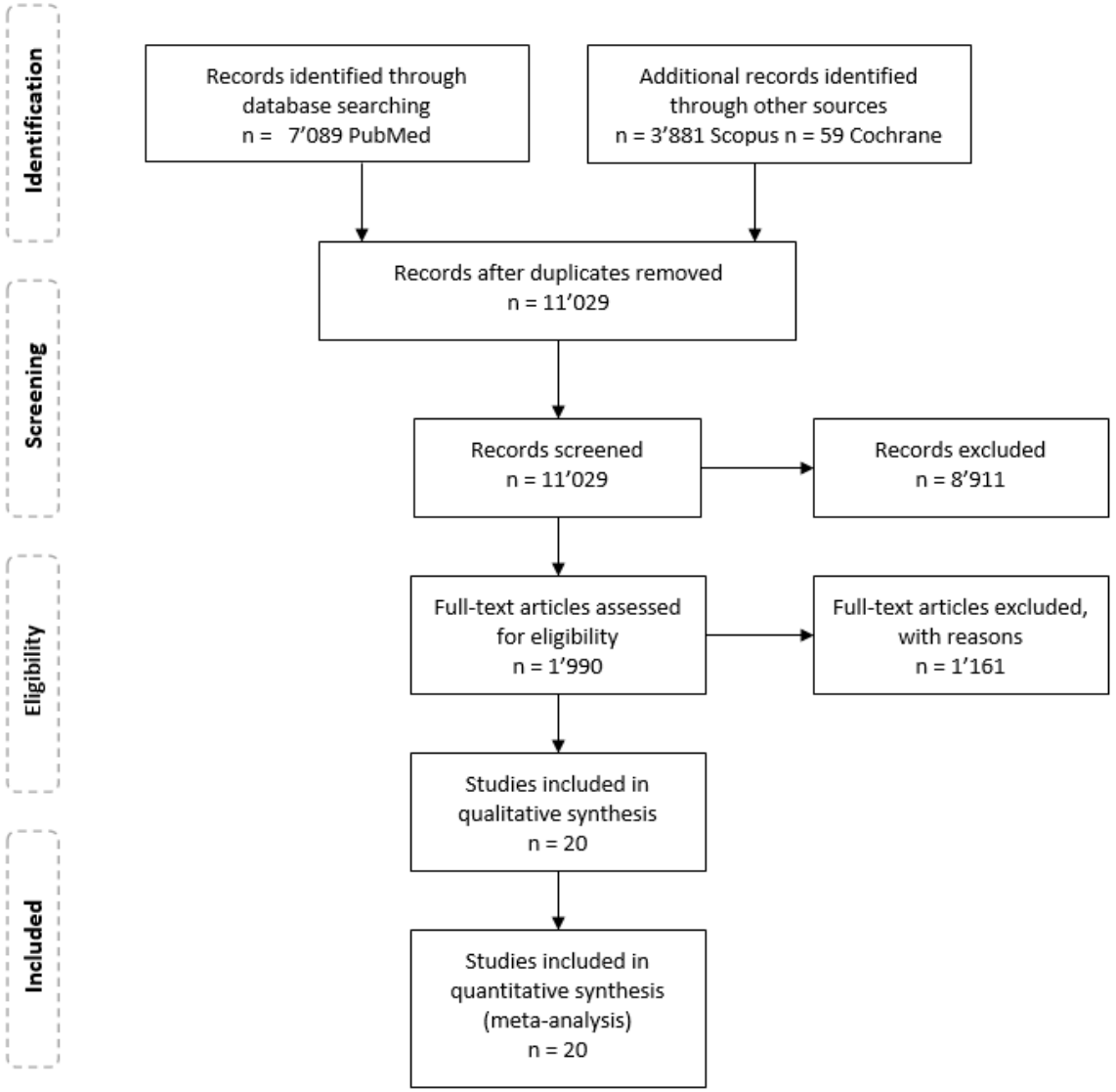
Data have been collected from studies published from 1992 to 2017.

Among the 1.990 studies left, 351 were excluded because they were duplicates.

The research produced 11.029 references from three databases: PubMed (7.089), Scopus (3.881) and Cochrane Library (59).

Subsequently, the remaining articles were read in full and, as a result, 1.161 papers were excluded because did not satisfy the inclusion criteria

Prisma flow-diagram



Results:

The final number of articles included was 20: 14 cross-sectional, 4 systematic reviews, 1 cohort study and 1 case control.
The full texts were evaluated and a score was assigned using **INSA tool (International Narrative Systematic Assessment tool)** for the systematic reviews and the **Newcastle-Ottawa Scale** for the cross sectional.

Articles evaluated with the Newcastle-Ottawa Scale

Author:	Year:	Questionnaire:	Category of workers:	Country:	Score:
Tomljenovic M et al.	2014	OSAQ; MBI-HSS; BDI-II	PHYSICIANS	CROATIA	N6
Gramstad TO et al.	2013	BCI; HADS; SCL-25; PMSS; CJSQ	PHYSICIANS	NORWAY	N6
Visser et al.	2003	Consultants' Job Stress and Satisfaction questionnaire; MBI	PHYSICIANS	NETHERLAND	N7
Ilic IM et al.	2017	COPSOQ; CBI	PHYSICIANS	GERMANY	N5
Klein J et al.	2011	JDC; ERI	PHYSICIANS	SWEDEN	N6
Belkić K et al.	2007	OSI	PHYSICIANS	GERMANY	N5
Bernburg M et al.	2016	CPQ, Work Ability Index, ICD-10 Symptom Rating; PSQ	PHYSICIANS	SWEDEN	N7
Tür FÇ et al.	2016	Swedish Demand Control Support Questionnaire	PHYSICIANS	JAMAICA	N7
Hutchinson TA et al.	2014	MBI; PSS	PHYSICIANS	BOSNIA	N6
Pranjić N et al.	2006	OSQ; WAI	PHYSICIANS	BOSNIA	N6
Kluger MT et al.	2003	MBI; Likert-type questions	PHYSICIANS	FINLAND	N6
Olkinuora M et al.	1992	MBI	PHYSICIANS	BRAZIL	N7
Andrade AN et al.	2011	WHOQOL-BREF	PHYSICIANS	GERMANY	N6

Articles evaluated with the INSA tool

Author:	Year:	Questionnaire:	Category of workers:	Country:	Score:
Vijendren A et al.	2014	GHQ; MBI; ISAT; STAI.	PHYSICIANS	UK	I7
Romani M et al.	2014	MBI.	PHYSICIANS	LEBANON	I6
Mukherjee S et al.	2009	PONSQ; JCS; STAI; PSS; MJS	PHYSICIANS	UK	I6
Marshal.l E	2008	JDR.	PHYSICIANS	UK	I2

Conclusions:

Our results show that more research on the subject is needed since only 20 articles on work-relates stress among physicians were selected.

Let's look...

Population Studied:

Background:

Methods:

The studies examined different physician categories: whilst some focused on specialized groups, mostly anaesthesiologists, emergency and surgeons others studied non-specialists, students or the general populations of physicians in a hospital or region.

exposure to well known WRS risk factors, such as long shifts, high responsibilities, demanding tasks etc.

Questionnaires used:

- **Maslach Burnout Inventory**: The MBI has five validated forms composed of 16-22 items to measure an individual's experience of burnout.
- **The Perceived Stress Scale**: PSS is the most widely used psychological instrument for measuring the perception of stress. It has different forms of 4-10-14 items.
- **State of Anxiety Index**: composed of 40 items, STAI is on of the best tools for anxiety measurement in adults.
- **Job Demand-Control Model**: individuates 4 categories of jobs based on demands and control.
- **Work Ability Index**: The purpose of WAI is to help define necessary actions to maintain and promote work ability. The scoring system of the questionnaire categorises work ability, with recommendations for action provided for each category.

Questionnaires used:

- **Copenhagen Psychosocial Questionnaire:** (COPSOQ) Conceptually, it includes the main dimensions of the most influential psychosocial theories at work, including the Job-Strain, Demand-Control-Support and Effort-Reward-Imbalance models, but also other theories and aspects ignored in previous tools, for instance emotional demands or role clarity. It is widely recognized and used.
- **Effort-reward imbalance:** it studies the stress as a result of the imbalance between effort and rewards.
- Many others questionnaires have been used in the articles reviewed.

Conclusions:

A strong correlation has been found between workers studied and high stress level, burnout and even suicidal thoughts. Studies based on different specializations showed a higher stress and anxiety risk in workers with longer shifts (or night shifts), job uncertainty, poor work conditions and wages and an increased stress and burnot risk in physicians dealing with chronically ill, incurable or dying patients.

Despite the importance of the matter at hand, most of the articles concord that there is not enough research in this field of study. Many authors agree that a multidisciplinary action must be taken to improve health and satisfaction of healthcare professionals, such as work enviromental changes and stress management programs, in order to take care of the patients and mantain a high standard in the healthcare system.

Once again it is important to underline the need for **further research** on the subject and on the possible solutions for the well-being of doctors and patients alike.

Thanks for your attention