

The Technostress: definition, symptoms and risk prevention

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Abstract

With the advent of Web 2.0 and Social media, a radical change in the world of communication and information flows has occurred, that have crossed space and time limits.

The new technology, with its rapid evolution marked by the access to the digital world through the Smartphone invention, resulted in a sharp acceleration of the rhythms of life and work. On the other hand a massive pervasiveness of digital technology in the professional and personal rhythms has been recorded.

Technostress, defined for the first time in 1984, is a syndrome that occurs when the person, subjected to information overload and continuous contact with most digital devices, develops a state of stress, or an abnormal response characterized by specific symptoms at the cardiocirculatory, mental and neurological levels.

The repercussions of Technostress invest business and relational sphere causing absenteeism, loss of professional effectiveness, conflict and isolation.

In 2007, the syndrome has been recognized as an occupational disease: this requires that in all workplace where a frequently use of digital technologies (ICT, publishing etc.) does exist, there is the need to include Technostress in the document of work-related risk assessment. This application is essential to put in place adequate protection and prevention measures, such as increased training of employees on the harmful effect of Technostress and implementation of specific strategies for managing symptoms.

Keywords: *Technostress, Web 2.0, Social Media, Smartphone, electrosmog, information overload, networkers, work-related stress*

Technology has changed the world, it made life easier and it is now so integrated in the existence of individuals that it is quite impossible to do without. The advent of digital technology with the development of the Internet has allowed the progress of humanity; the World WideWeb has revolutionized the companies that have embraced the digital world, while the Web 2.0 and social media communication has changed dramatically, and in the same time all have become both users and content authors.

The territories have become hyper-places where the flow of information and data generated by electronic

devices (devices) have exceeded the limits of the physical environment.

The new technology with all its evolutions has been, and is still the subject of numerous studies and research that highlight the positive and negative aspects.

In particular, the advent of the Smartphone has formed the largest gateway to digital but also a real life remote control, a tool that accompanies all rituals of existence.

With the invention of the *App*, also the potential and contexts of use are increased.

The term *Technostress* was coined by the American psychologist Craig Brod in his book published in 1984

by Addison Wesley: "Technostress: the human cost of the computer revolution". The psychologist referred for the first time to the stress associated with the use of technologies and their impact on the psychological level. In the definition of Brod, the Technostress was "a modern disease of adaptation caused by inability to cope with new computer technologies in a healthy manner", meaning both computers and software [1]. In 1997 this concept was revised and expanded by two American psychologists, Larry Rosen and Michelle M. Weil, in the book "TechnoStress: Coping With Technology @ Work @Home @Play", as a result of a research lasting 16 years. In their analysis the meaning of technostress become wider indicating "any negative impact on attitudes, thoughts, behaviors or psychology caused directly or indirectly by technology" [2].

The times induced by technology, evolving too quickly, do not adapt to the location of individuals, why they develop a psychological pressure characterized by discomfort and frustration.

As far as concerns symptoms due to the syndrome of Technostress, one can recognize anxiety, mental fatigue, depression, nightmares; in particular, many people were subject to frequent bouts of anger caused by the difficulties of computer software and the use and management of faults or blocks which interrupted the work [1].

The theoretical framework developed by Brod, and later that proposed by Rosen and Wail, is strictly related to the period in which it was conceived. In recent years many changes have occurred, both in technology and in communications; The Internet network has been transformed into a universal tool for information and digital technology becomes common with the advent of smartphones, tablets, Wi-Fi and digital TV. So, now the term Technostress acquires a new meaning with the transition to the era of connections, where information is everywhere. In the new sense, this refers to the syndrome huge amount of information to which individuals are immersed and which is absorbed and managed on a daily basis leading to a cognitive overload: this phenomenon in psychology is called "information overload". When the brain receives information, it corresponds to the psychic level to a mental input. This requires a response which results in activation of neuronal connections. When inputs are many and constant, as in the case of the information overload and management of multiple digital devices, there is a state of alarm and stress, or an abnormal response (mental and physical) of the body that is manifested by an intense production of adrenaline and cortisol. In this condition cardiovascular disorders, psychic and neurological diseases are possible consequence in the short and long period [3].

The strain is generated by the large amount of information "input" that go beyond what the individual can reasonably absorb. In these cases one can experience a

state of anxiety, characterized by a widespread fear of being overwhelmed by an immense amount of material that cannot be put in order and under control [4].

Another factor that has allowed the emergence of Technostress, both in the workplace and in the personal and relational setting, is the role of mobile technology that favours continued use of the information flow without constraints of space and place.

This element highlights a major difference with the first embryonic definition of Brod who took in analysis the psychophysical reactions of subjects who were working at their desktop.

Indeed, in early studies we could already see the problematic fact that the rapid evolution of technology would have in the future, as revealed by research by Sandra Champion in 1988 that effectively described the technostress as "the result of technology" [5]. The same Brod who coined the term, defined the technostress as a condition caused by the difficulty of people and professional areas to adapt to rapid changes in technology. In the study of Brod emerged as factors of technostress also the level and the user's technical expertise, the pressure applied from the outside during use and the atmosphere lived within the work place [6].

The complex mechanisms generated by technological innovation has led to changes that help to trace the signs identifying the technostress risk:

- Constant use of the smartphone even in social gatherings;
- The subject never turns off the phone;
- Are very frequent nocturnal awakenings to connect to Social platforms;
- It also warns the instinct to call in private places (cinemas, libraries etc.);
- Writing messages while on the move;
- The tv is primarily used on the tablet or mobile phone.

Next to these "risk behaviors", one can outline a number of symptoms that characterize the syndrome technostress that often, for lack of information, are not properly identified:

Physical symptoms

- Increased heart rate;
- Cardiovascular disorders (hypertension, coronary heart disease);
- Gastrointestinal disorders (irritable bowel syndrome, gastritis, reflux);
- Muscle tension pain;
- Tingling in the limbs;
- Insomnia and sleep-waking rhythm disorders;

- Headache;
- Chronic fatigue;
- Sweating;
- Cervical pain;
- Hormonal and menstrual disorders in women;
- Stress-related skin disorders (psoriasis, dermatitis).

Mental symptoms (behavioral and cognitive)

- Irritability;
- Depression;
- Behavioral changes;
- Decreased sexual desire;
- Crying spells;
- Apathy.

The symptomatology has a subjective component and each person may develop certain symptoms or not. This is what happens generally in reactions to stress which affect not only external elements, but above individual elements that are defined in the literature "subjective factors". These factors intervene in the reaction process but are not bound to any external element. Out of these subjective elements, it is possible to work on prevention activities by intervening on the inner aspects that "respond" to the stressful events [7].

Furthermore symptoms attributable to those caused by the so-called "electromog", or excessive exposure, day and night, to electromagnetic fields emitted by electrical appliances, routers and Wi-Fi modem, smartphone, tablet and pc.

The Technostress in an advanced stage is responsible of many repercussions, both at the working and relational level. At work amnesia and memory disorders can occur, and this is associated with an increasing absenteeism, lack of motivation and loss of professional effectiveness.

The symptoms caused by technostress often coexists with other psychological and physical phenomena such as the syndrome of burn-out and derivative disorders from workaholism. These conditions are not diseases but represent an important psychosocial risk factor. There is evidence that these factors can lead to serious health consequences and produce in subjects certain diseases. For this reason, the stress derived from technological dependence, which is still an underestimated phenomenon, is diagnosed in a late stage, often after serious events related to health such as heart attacks, for which is prescribed a long rest period away from work [8].

Also on the relational level technostress has a strong impact: the technostressed subject reacts with the

isolation and emotional closure, he/she has bouts of anger, conflicts with colleagues and family. These conditions often result in a syndrome of Internet addiction (IAD - Internet Addiction Disorder), disorder that is intertwined with technostress.

In 2007 Technostress has been recognized as an occupational disease following a prosecutor's ruling added the Court of Turin, Raffaele Guariniello. The transition to the definition of occupational disease occurred after numerous complaints and concerns of employees. The first investigation took place in a call center, high-risk places technostress. But as it happened in the evolution of the term, many investigations have been made in the past, when the technology was not yet developed and the digital information was not present in large numbers. For this reason, the technostress can register new cases, different in symptoms and the degree of severity; furthermore professional risk may also increase for the birth and growth of new professional categories. At present, every working area, where one frequently uses digital technologies (ICT, publishing etc.), shall be included in the document of the work-related stress risk assessment, i.e. Technostress risk.

This path is applied in accordance with the *Consolidated Law 81/2008 of Health and Safety at work*. Given the recent spread of Technostress, the risk assessment in professional fields is essential to identify appropriate protection and prevention measures concerning the organization of work, procedures, information and training of workers [9].

In the survey on risk assessment in the workplace, it is very important to frame the type of company to establish the kind of relationship with the information load and the simultaneous management of multiple digital devices (multitasking). This often happens in companies that deal with publishing where workers use creativity, simultaneously running programs and interact with the social network (multimedia, inclusion of online reviews, use of discussion forums) [10].

The working environments where the risk is high technostress are many; however, the most at-risk workers are networkers (who works in the network), the ICT professions (Information and Communications Technology), call center operators, journalists, community manager and web content editor, accountants, lawyers, advertising, financial analysts, business people and programmers.

The parameters that help define the risk of Technostress entities are the elapsed time to manage the digital information, the amount of load information and symptoms that indicate a marked tendency to sag in the syndrome [9]. In order to draw the boundaries of the disorder technostress the presence of two particular elements is recognized: the radical acceleration of the

rhythms of life and work and the merger between personal and professional life caused by the pervasiveness of digital technology. Each person can work or be contacted at any time and in any place. The digital revolution and social media have distorted the usual concept of separation between the online and offline. Individuals in the present age are screened in a spherical time that has no beginning or end, where aspects of professional and personal life merge into a single stream of representations and digital content. The Technostress shows very clearly its face in the business world, especially the one in which it makes heavy use of social platforms in the company even when they are not used for purposes related to productivity or professional activity.

Controlling, often in an obsessive way, the email out of context and the working hours (upon waking, in bed, at the table, on holiday etc.) induces people to not separate the contexts and to continue to manage the information load with the same intensity. It certainly cannot deny that the advent of smartphones has led to countless benefits and employment opportunities, allowing us to manage projects and distance activities, improving staff productivity and creating new connections with companies and entrepreneurs although active at great distances. The central issue is that the management of these tools must be aware and professional, in order to avoid getting to the domain of a continuous digital stream [11].

The continued availability granted by “always on” (always connected) is functional to businesses who want to maintain a constant pressure on resources even outside the workplace, a phenomenon which generates an increase in productivity, however, is not recognized in earnings. On the other side, even in the absence of an effective contractual arrangement, the worker tends to tolerate these intrusions, considering them an integral and inevitable activity and their role, and to consent to send feedback quickly even when requests via email or messages are made late in the evening, night or weekend. Continued connection and without borders can have a negative effect on mental and physical health, social, affective and professional relationships, and on the same work performance.

Consequence management involves the implementation of prevention strategies, training and measures for the management of symptomatic load. Remedies available for Technostress are those that cause the mental and physical relaxation and interruption, for some portions of time, the digital stream through *mental techniques* (Neuro-linguistic programming , concentration exercises), *holistic*

techniques (yoga, acupuncture, meditation), *sports techniques* (sport and walks in contact with nature), *regenerative techniques* (natural food, use of herbal medicine, homeopathy, naturopathy) [9]. In the workplace it is important to provide for a reorganization of work and a proper distribution of the work load in compliance with timetables and extra-working spaces. A good strategy should also include the activation of the request for increased training of workers on the technostress risk assessment and damage associated with electromagnetic fields.

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