


MOBBING: A META-ANALYSIS

MOBBING: UNA META-ANALISI

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Abstract

Background: Mobbing is the set of discriminatory and oppressive acts carried out against a worker for a long period of time.

Objective: Considered the lack of plain scientific evidences of the consequences of mobbing on the victims' life, the aim of our meta-analysis is to review the articles present in literature and to find and evaluate the effects of mobbing on the psychophysical health of mobbed workers.

Methods: Through this systematic search of the articles existing in literature between 1990 and 2009, we found 13 publications useful to our aim. They were case-control studies and offer results expressed as mean and measures of dispersion, which were our inclusion criteria.

Statistical analysis was performed on subcategories identified within 5 general categories.

Results: On the base of statistically significant results, we found that mobbed workers in the category "Measures of personality" have an increase of cynicism, with a low heterogeneity among studies, a reduction of emotional balance (high heterogeneity among studies), of belief in justice (high heterogeneity among studies) and of self-esteem. In the category "Measures of mental health" we found a significant increase of stress and of impairment of mental health, in both cases with high heterogeneity among studies. Mobbed workers show a significant impairment of physical health too, with high heterogeneity among studies. The results of the category "Measures of perceived occupational stress" show that the worker's role and the lack of support from colleagues (in both cases with low heterogeneity among studies) can influence and worsen cases of mobbing. In the category "Measures of coping strategies" there aren't significant differences between victims and controls.

Conclusions: We can conclude that mobbing affects the victims' working and social life and their psychophysical health.

Abstract

Introduzione: Il mobbing è l'insieme di atti e comportamenti discriminatori e vessatori, protratti nel tempo, posti in essere nei confronti di un lavoratore.

Obiettivi: Scopo della nostra meta-analisi è effettuare una revisione aggiornata degli articoli scientifici presenti in letteratura e individuare e valutare gli effetti sulla salute psico-fisica dei soggetti mobbizzati, soprattutto alla luce dell'inesistenza di evidenze scientifiche chiare sulle conseguenze del mobbing sulla vita delle vittime.

Metodi: La ricerca sistematica degli articoli esistenti in letteratura dal 1990 al 2009 ha portato all'individuazione di 13 pubblicazioni utili al nostro scopo, ossia che rispondessero ai seguenti criteri di inclusione: essere studi caso-controllo; esprimere i risultati in termini numerici di media e indici di dispersione. L'elaborazione statistica dei dati è stata effettuata per sottocategorie individuate all'interno di 5 categorie generali.

Risultati: In base ai risultati statisticamente significativi ottenuti dall'analisi dei dati si deduce che nei mobbizzati per la categoria "Misure di personalità" vi è un aumento del cinismo, con bassa eterogeneità tra gli studi, e una riduzione della stabilità emotiva (alta eterogeneità tra gli studi), della fiducia nella giustizia (alta eterogeneità tra gli studi) e dell'autostima e positività nella vita (bassa eterogeneità tra gli studi). Per la categoria "Misure di salute mentale" si riscontra un aumento significativo dello stress e della compromissione della salute mentale, entrambi con alta

eterogeneità tra gli studi. I mobbizzati presentano inoltre una significativa compromissione della salute fisica, con alta eterogeneità tra gli studi. Dai risultati della categoria "Misure di percezione dello stress in ambito occupazionale" emerge che il ruolo ricoperto dal lavoratore e la mancanza di supporto da parte dei colleghi (entrambi con bassa eterogeneità tra gli studi) sono importanti nell'aggravamento dei fenomeni di mobbing. Nelle "Misure delle strategie di coping" non emergono differenze statisticamente significative tra vittime e controlli.

Conclusioni: Si può concludere quindi che il mobbing può provocare influenze negative sulla vita dei soggetti che ne sono vittime, sia dal punto di vista lavorativo e della vita di relazione, sia sulla salute psicofisica.

Background

In recent years, mobbing has been the subject of concern for public opinion, institutions and scientific community all over the world. This phenomenon, that maybe has always existed, is still not clearly defined.

Leymann first used the term "mobbing" in the early 80s to describe, in the working world, a kind of psychological terrorism that entails an unfriendly and unethical behaviour carried out systematically – not occasionally – by one or more persons against an individual, who finds himself in a helpless condition being the victim of various oppressive and persecutory acts (1). These acts have to occur with a well-defined frequency (at least once a week statistically) and over a long period of time (at least 6 months). This kind of mistreatment provokes marked mental, psychosomatic and social distresses, because of the high frequency and the long duration of the hostile behaviour (2, 3, 4, 5). Leymann attributes the motivating factor of this behaviour to conflicts on workplace. He identified 6 fields of conflict development that can give rise to mobbing; the first three ones are factors external to the working group (work organization, functions, work direction), while the other three are more linked to it (social dynamics of the working group, theories about personality, hidden function of psychology in society) (6).

Many researchers tried to explain mobbing. For example, Tim Field's "guilty" approach is centred on the "bully" figure, he could be the boss or the colleague who puts mobbing acts into action. Nevertheless, other researches assert that mobbing is a problem of the enterprise, not of the individual. The first Italian research was conducted by Ege in 1998 (7). He identified 7 phases in the development of mobbing: pre-stage or "zero condition"; targeted conflict; beginning of mobbing; first psychosomatic symptoms; errors and abuses in the management of personnel; serious worsening of the victim's psychophysical health; exclusion from the world of work: final removal of the victim from the workplace.

On the basis of the results of several scientific studies realized over the years we can identify the factors involved in the genesis of mobbing:

A) Psychological features of involved people. Although some features of personality seem to recur more frequently in victims, it is not easy to understand whether these features are previous to the violence or its effect. Victims of mobbing have been described as anxious, insecure and with a low self-esteem (8); they are considered hypersensitive, cautious, docile and unable to respond to provocations (9).

B) Features of interpersonal relationships in the workplace: interpersonal conflicts belong to daily life in every working group and organization. But sometimes the social climate in the workplace deteriorates and creates conflicts turning into violent collisions between two or more persons. These conflicts can lead to sabotages, retaliations and even elimination and destruction of the rival. Both Leymann and Einarsen (6, 8) believe that unsolved interpersonal conflicts could become mobbing if suitable interventions and strategies of management of the conflict are not applied. On the contrary, according to many studies, harassments and moral attacks against weak persons are innate in social human relations, being a native feature in humans.

C) Features of working organizations and conditions: according to Leymann (1, 6, 10), the features of the personalities of victims and attackers are not enough to cause mobbing. Organizational malfunctions at work are the main cause of harassments. An improper practice of leadership based on extreme authoritarianism (11), the lack of discussion and planning of working times and aims, the low flow of informations (12), the little autonomy in work management, the ambiguity of the aims to be reached, the exaggerated control of working times (13) and the exaggerated working

performances and burdens requested (14) are solidly considered risk factors; but also "monotonous tasks and low aims to be reached" (15) are sometimes considered risky situations.

Therefore, the origin of mobbing can be defined multifactorial, because it results from the combination and simultaneous presence of organizational, personal and relational factors, together with those conflicts that someone believes innate in human relationships.

Mobbing affects the victims' life in their social relationship, in their economic condition (because they often lose their jobs), in their physical and psychological health.

There are 5 types of mobbing: a) down-up mobbing: the mobber is in a lower position than the victim; b) top-down mobbing: the mobber is in a higher position than the victim; c) strategical bossing: it's a form of mobbing enterprises strategically use to make it easier sacking "troublesome" people; d) horizontal mobbing: the mobber and the victim are on the same level; e) double mobbing: it happens when the victim's family is no more able to offer the mobbed the possibility to give vent.

From what above, it is clear how complex mobbing is and how difficult it is to give a synthetic evaluation of all the aspects of the problem. The lack of a unique definition of the word "mobbing" entails differences also as to the mobbing action (length and repetitiveness of the harassing acts, intentionality of the acts, negative consequences on the victim's psycho-physical health) and as to the criteria used to select the sample of people to be defined "victims of mobbing - bullying - harassment". As a consequence, it is difficult to provide descriptions and evaluations of such a complex phenomenon. Moreover, while the exposition to chemical, physical and biological occupational risks is the object of research for Occupational Medicine, it doesn't exist in literature a plain evidence of the consequences of mobbing on a person's psycho-physical health.

Objective

The aim of this study is to systematically search scientific articles about mobbing and to identify and evaluate the main factors in the genesis of mobbing, the effects on the workers' psycho-physical health and the more important features in the mobbed person's psychology, through meta-analysis, which is a tool of Evidence Based Medicine.

Methods

Our literary systematic search of articles on mobbing was conducted using the following databases: PubMed, Medline, Medline+, PsycInfo, PsycArticle, Nioshtic-2, Scopus, Google Scholar, Biomedcentral. The key-words were: MOBBING, BULLYING, HARASSMENT, BULLYING AND WORK, HARASSMENT AND WORK.

Apart from the article published in 2007 by Tomei et al., on *Giornale Italiano di Medicina del Lavoro ed Ergonomia*, titled "Evidence based medicine and mobbing", the research took into account articles published from 1990 until 2009 (16). Unpublished data the authors had heard about and the proceedings of national and international conferences were also considered. References present in the articles, in the reviews and in the meta-analyses already published on mobbing were also examined, in order to find other publications that could be useful to our aim. No restriction as to type of language or publication was applied.

This research found 2000 articles.

We considered only articles about adult people.

We excluded the articles about sexual harassments at work not perceived as mobbing. We excluded the articles on school bullying among pupils, while we included the articles on bullying among workers.

The phenomena of discrimination motivated by religious, political, ethnic or sexual reasons were not considered if not treated as mobbing.

For our meta-analysis, we selected the useful articles according to two main criteria: they had to be case-control studies and they had to express the results as means and measures of dispersion (standard deviation, standard error, etc.).

Only 13 publications followed our inclusion criteria, because most of the articles were reviews of other publications or descriptive articles.

In the articles we evaluated the words "bullying" and "mobbing" were often used as synonymous, confirming the lack of a univocal terminology.

- **Studies selection and extraction of data**

Two reviewers evaluated independently the title, the abstract and the keywords of each selected study and applied the inclusion and exclusion criteria. The same procedure was followed for the full-texts and for the extraction of the most important data, in order to increase the reliability of the study.

- **Selection criteria and description of the participants**

The authors of the articles included in our meta-analysis used different questionnaires to select the participants and to identify cases, that is victims of mobbing, and controls, that is non-victims. The questionnaires were in part derived from standardized questionnaires, already used in the scientific field, and in part elaborated by the same authors of the articles.

In the studies we selected the casuistry came from two different ways of recruitment: a direct one, through a self-assessment questionnaire and/or an interview in the workplace, a self-assessment questionnaire and/or an interview by phone or by e-mail on large sample of workers, an interview to volunteers working in an association in favour of the victims of mobbing; an indirect one, through data from lists of claims for health damages. "Victims" were selected according to the self-definition or to the positive answer to the self-assessment questionnaire, or to both of them. Controls were selected according to the negative answer to the questionnaire or to self-definition as "non-victim", otherwise they were workers who claimed for other causes than mobbing.

The participants were workers who had claimed for compensation for harassment at work to a health service organization (9). The controls were the workers who didn't claim for mobbing, though reporting a psychological impairment that needed the evaluation through the Minnesota Multiphasic Personality Inventory 2 (MMPI-2).

The participants were selected through a phone interview or a mail questionnaire about workplace, health, well-being, with questions about the presence of conflicts at work (sexual harassments, actions for libel, threats, bullying, etc.). Three categories of workers were identified: victims of bullying (35 workers, 2% of the starting sample); workers occasionally exposed to bullying (359); workers not-exposed to bullying (1405) who were the control group. For our meta-analysis only the results from the group of the victims and from the control group were considered, because they were comparable to the features of the other studied populations (17).

In Vartia, 2001 the workers of the selected sample had to define themselves as victim, non-victim or witness of bullying according to the provided definition (18). An adapted version of the Leymann Inventory of Psychological Terrorization (LIPT) was administered in order to evaluate the aspects and the frequency of bullying. The group of the victims was thus formed by 94 workers (controls: 83 workers).

In Zapf and Gross, 2001 bullying was investigated in two ways: by a list of questions adapted from the German translation of the LIPT and by self-definition. Participants were considered victims when a positive answer was given to at least one of the questions of the LIPT with a frequency of once a week at least and for six consecutive months at least. They also had to define themselves as victims of mobbing according to the provided definition. The group of controls was formed by the workers who didn't present the reported features of the victims (19).

In Mikkelsen and Stale, 2002 the participants were selected using an anonymous questionnaire about the exposition to bullying, the presence of typical symptoms of the Post-Traumatic Stress Disorder (PTSD) and of other stressing experiences. 118 workers were identified as victims while the control group was randomly selected (118 workers) to be comparable as to age, sex, work-role and education level. Obviously, no worker of the control group had ever been subjected to mobbing actions. Participants were administered the Negative Acts Questionnaire (NAQ) which investigates acts of bullying against workers (20).

In Vartia and Hyti, 2002 self-definition was used to establish whether the workers were exposed to bullying or not. The definition of the specific forms of bullying workers are subjected to, is obtained through 6 other questions from an article by Vartia et al, 1993 (21).

In Coyne et al., 2003 participants were administered a questionnaire that aimed to outline both the victim of bullying and the aggressor. The questionnaire started with a definition of bullying and each participant was asked to say how often he was subjected to bullying at work, from whom and for how long, but he was also asked to reveal if he himself was the aggressor and who the victim was, how often and how long. Each participant received a numerical code, so, controlling the codes, 4 categories of "actors" of bullying were identified: self-defined victims; victims pointed by others; self-defined aggressors; aggressors pointed by others. "Self-defined victims" are the workers who reported to have been subjected to

bullying, according to the provided definition, once a week at least and for 6 consecutive months at least (50 workers). Control group (99 workers) was formed by workers who didn't belong to the above categories (22).

In Agervold and Mikkelsen, 2004 participants were selected through a 12 item checklist from Einarsen and Rainescu's NAQ, plus 2 other questions. The checklist aims at verifying the exposition to bullying. Participants were identified as "victims" when they defined themselves exposed to at least one of the negative acts of the items, with a frequency of at least twice-three times a week or daily in the last 6 months. According to these criteria, two groups were formed: victims (24) and non-victims of bullying (161) (23).

In Hoel et al., 2004 a definition of bullying was provided to the participants, followed by questions about their experience concerning it: according to the answers, the workers were divided into 4 groups: current victims; victims in the former 5 years; witnesses; neutral group (neither victims nor witnesses). For our meta-analysis only the current victims (cases) and the neutral group (controls) were considered, because they were more similar to the groups of the other studies. A revised version of the NAQ, composed of 29 items about the negative conducts against the victims, was used to assess the negative behaviours workers considered as victims of bullying were subjected to. It emerged that 10.8 % of all the examined workers (553) were victims of bullying. Though the frequency criterion used was not explained (24).

In Gilioli et al., 2005 a multiple choice questionnaire was administered to the participants, the same one used in the Clinica del Lavoro Luigi Devoto in Milan (CDL Questionnaire). The questionnaire consists of 3 sections: 21 items about personal data and working position; 39 items about working conditions; 4 items from the Euroquest Symptoms Questionnaire about the quality of life and the health conditions. The results show that a number of 5 mobbing actions is enough to define a potentially risky situation (25).

In Adoric and Kvartuc, 2007 the exposition to mobbing in the participants was evaluated using NAQ. The score shows the seriousness of the worker's exposition to mobbing (26).

In Glaso et al., 2007 the participants were selected and included in the group of the victims of mobbing or in the control group in two different phases: administration of the Norwegian version of NAQ; self-definition as victim or non-victim of bullying according to the provided definition (27).

In Pompili et al., 2008 the detection of cases and controls and the evaluation of the risk of suicide in mobbed workers were assessed using a semi-structured interview according to the criteria of the DSM-IV and using the MMPI-2. The participants didn't present any disorder of Axis I and they didn't undergo any psychiatric therapy. The final score shows the worker's real risk of suicide (28).

In the total number of the workers included in our meta-analysis (8021) the cases ("victims of mobbing") are 1713 and the controls are 6308.

The range of the participants' age is very large: from 16 to 70 years.

Whether workers were men or women is not specified in most of the articles.

Also the working categories were not always reported, because very large samples of participants (up to 5000) were often recruited using direct-mail questionnaires or phone interviews (see table.2). From the studies reporting working roles, we could infer a high heterogeneity of tasks.

- **Organization of the data**

After a careful analysis of the selected articles, we identified the variables that were more useful for our aim which were grouped into subcategories within homogeneous categories. Some studies were used for the processing of the data in different categories.

Unlike the publication of 2007 by Tomei et al. on the *Giornale Italiano di Medicina del Lavoro ed Ergonomia*, titled "Evidence based medicine and mobbing", we identified 5 categories: Measures of Personality; Measures of mental health; Measures of physical health; Measures of perception of stress at work; Measures of coping strategies. Several subcategories were also formed to include all variables selected (16).

Table 1 shows the organization of data in categories, subcategories and variables and the studies considered.

- ✓ **Measures of personality**

7 studies were present in this category.

The tools the author used to identify the variables of this category were:

- 1) in Coyne et al., 2003: ICES Personality Inventory;
- 2) in Vartia et al., 2001: Occupational Stress Questionnaire;
- 3) in Gandolfo, 1995: MMPI-2;
- 4) in Pompili et al., 2008: MMPI-2;
- 5) in Adoric and Kvartuc, 2007: A – a questionnaire with items from (i) the General Belief in a Just World Scale, (ii) the Personal Belief in a Just World Scale, (iii) the Belief in a Injust World Scale, (iv) the Justice Centrality Scale; B - the Depression Scale D92; C – the Extended Life Orientation; D - the Philosophies of Human Nature Scale;
- 6) in Glaso et al., 2007: International Personality Item Pool;
- 7) in Mikkelsen and Stale, 2002: World Assumption Scale.

✓ **Measures of mental health**

The studies of this category were 6. The tools were:

- 1) in Agervold and Mikkelsen, 2004: Psychosocial Work Environment and Stress Questionnaire;
- 2) in Vartia et al., 2001: Occupational Stress Questionnaire;
- 3) in Vartia and Hyti, 2002: General Health Questionnaire;
- 4) in Gandolfo, 1995: MMPI-2
- 5) in Pompili et al., 2008: MMPI-2;
- 6) in Hoel et al., 2004: General Health Questionnaire 12.

✓ **Measures of physical health**

Two studies were present in this category. The tools were:

- 1) in Gilioli et al., 2005: CDL Questionnaire;
- 2) in Hoel et al., 2004: Occupational Stress Indicator.

✓ **Measures of perception of stress at work**

The studies of this category were 5. The tools were:

- 1) in Coyne et al., 2003: Seigne's Scale from the ICES Personality Inventory;
- 2) in Vartia and Hyti, 2002: Occupational Stress Questionnaire;
- 3) in Gandolfo, 1995: a question about the months of absence from work due to illness;
- 4) in Agervold and Mikkelsen, 2004: Psychosocial Work Environment and Stress Questionnaire;
- 5) in Gilioli et al., 2005: CDL Questionnaire.

2.3.5 Measures of coping strategies

3 articles were present in this category. The tools were:

- 1) in Mikkelsen and Stale, 2002: Post-Traumatic Diagnostic Scale;
- 2) in Hogh and Dofradottir, 2001: a scale based on Pearling and Schooler's theory partially adapted for studying coping strategies;
- 3) in Zapf and Gross, 2001: Rahim Organizational Conflict Inventory II Scale.

The features of the selected studies are reported in the table 2.

Analysis of data

The statistical analysis of data was performed, for each subcategory, through the Comprehensive Meta-Analysis, that is a software for meta-analysis evaluation; it was not performed within the categories because the data were not homogeneous enough.

We didn't find the analysis of each variable useful, because they were present only in one study.

The group of the victims was compared to the control group to verify the differences between them. Effects Size (ES), which reflects the magnitude of the strength of a relationship between two variables, is the unit used in our meta-analysis. We evaluated also the confidence interval of the ES, reflecting the precision with which ES was estimated in our study.

The confidence interval in our study corresponded to 95% of observations, so p value was fixed at $p < 0.05$. P value expressed the significance of ES, being strictly related to the confidence interval.

When the studies presented data as mean and standard deviation, ES was computed by Standardized Mean Difference (SMD) or Weighted Mean Difference (WMD) according to the value of the Inconsistency Index.

Inconsistency Index (I^2) was used as a measure of heterogeneity. In systematic review, heterogeneity referred to the variance or to the difference among studies in the estimation of the effect.

Through I^2 we measured the proportion of observed real dispersion. When I^2 was almost zero the dispersion was random, while when I^2 was large it would make sense to speculate about the causes of that variance.

The calculation of heterogeneity was used to choose the statistical model to evaluate ES.

When Inconsistency Index was high ($I^2 > 50\%$), ES was calculated through Random Effects Model (REM), a statistical method in which confidence interval is influenced by sample selection bias in the study and by variance among the studies included in the meta-analysis. In this case, REM is stronger than other solutions because it provides confidence intervals larger than those provided by other methods such as Fixed Effects Model (FEM). ES was calculated through the Standardized Mean Difference (SMD) that expresses the ratio between the differences of two means and a standard deviation estimator within the studied group.

When the inconsistency was low ($I^2 < 50\%$), ES was calculated through Fixed Effects Model (FEM), a statistical method in which confidence interval is influenced only by the variance in the study.

In this case, the ES was calculated through the Weighted Mean Difference (WMD), that combines the measures belonging to a continuous scale when mean, standard deviation and sample size are known.

The weight given to each study was determined by the precision of the estimator of the effect, assuming that all studies have measured the variable with the same rating scale.

Results

The results for each subcategory are shown in table 3.

• Measures of personality

In the subcategory "Belief in Justice", there are significant differences between the group of the victims and the control group ($p < 0.05$), with scores that show that the victims of mobbing believe in justice less than controls (SDM -0.705).

In the subcategory "Cynicism" the significant difference ($p < 0.05$) between the two groups shows that the victims of mobbing are more cynic and discouraged than controls.

In the subcategory "Emotional balance" there is a significant difference between victims and controls ($p < 0.05$) showing that the victims are emotionally more unbalanced (SDM -0.295) than controls.

In the subcategory "Self-esteem and Positivity in life" there's a significant difference between victims and controls ($p < 0.05$), showing a reduction in self-esteem in victims compared to controls (WMD -0.288).

In all subcategories the heterogeneity is high ($I^2 > 50\%$), except in the subcategories "Cynicism" and "Self-esteem and Positivity in life" where the studies are very homogeneous ($I^2 = 0.00$).

In all the other subcategories there were no significant differences between the two groups.

• Measures of Mental Health

In the subcategory "Stress" the difference between victims and controls is significant ($p < 0.05$), showing an increased stress in the victims of mobbing.

In the subcategory "Impairment of mental health" there are significant differences between victims and controls ($p < 0.05$), showing an increased impairment of the mental health in the victims of mobbing.

The heterogeneity is high in both subcategories ($I^2 > 50\%$).

• Measures of Physical Health

In the subcategory "Impairment of Physical Health" there are significant differences between the two groups ($p < 0.05$) with a higher impairment of health conditions in the victims of mobbing than in controls.

The heterogeneity is high ($I^2 > 50\%$).

- **Measures of perception of stress at work**

In the subcategory "Worker's role (negative features)" the significant difference between victims and controls ($p < 0.05$) shows that an inadequate working position and the consequent dissatisfaction are higher in the victims of mobbing.

In the subcategory "Relations with colleagues and lack of support" the significant difference between victims and controls ($p < 0.05$), shows that the lack of support and collaboration with colleagues is more frequent in the group of the victims and it concurs to provoke mobbing situations.

The studies in these subcategories are homogeneous.

In all the other subcategories there were not significant differences between the two groups.

- **Measures of coping strategies**

The results from the subcategories within "Measures of coping strategies" didn't show any significant differences between the two groups.

We underlined the numerical difference in the number of victims (404 in "Avoiding behaviours" and 774 in "Other strategies") and controls (1538 in "Avoiding behaviours" and 8708 in "Other strategies").

Discussion

Literature review showed a lack of common criteria defining the main features of mobbing. There isn't a universal agreement on any of the features that, according to Leymann, should be typical in mobbing, such as the duration, the repetitiveness, the typology of acts, whether mobbing is only moral violence or also physical or sexual harassment, whether the actions are deliberate or not.

As many authors have already pointed out, the first problem to face is this lack of a univocal definition of mobbing (19, 29, 30). Moreover, analyzing the definitions and the methods of selecting victims in the studies, it is evident that the temporal criteria chosen to characterize the repetitiveness of mobbing actions are not univocal. In some studies (23) the period of time is a month, in others (29) three months, in others (20) from six months to a year. In addition, in many studies temporal criteria aren't contemplated or explained.

Authors do not agree as to the typology of actions and their intentionality. Actually it is difficult and complex to understand whether the actions reported by the victims are intentional or not.

Another cause of disagreement among authors is the problem of physical violence, in particular of sexual harassment at work. In most cases physical violence is expressly included in mobbing. In very few cases mobbing is considered only a psychological violence. As to sexual harassment, many authors, in agreement with Leymann, find that insulting words or acts regarding sexuality have to be considered as a form of mobbing when working climate is influenced by refusal or acceptance of such behaviours.

The disagreement among the authors about the description of mobbing is reflected in the evaluating tools they used. Most of the questionnaires are almost always based on the victim's self-esteem and perception; they are often elaborated by the author themselves and sometimes they are the revision of other more famous questionnaires: all this doesn't help an objective evaluation of mobbing. The heterogeneity in the selection of the "victims of mobbing" is also due to the tools which are not only subjective but often different from one another or differently used.

Thus, the lack of a common tool of measurement of mobbing makes it more difficult to carry out a synthetic analysis of the literature and a critical comparison among the studies, as other authors show (31, 32, 33).

Moreover our research highlighted a deficiency of observational studies comparing a group of mobbed workers and a control group, so that it is difficult to have a plain scientific evidence.

From the global evaluation of the studies considered in our meta-analysis it is clear that the results could be affected by various factors: the heterogeneity of the ways of identification of victims and controls; the identification of the victims through the subjective perception of being victims of mobbing; the disproportion in the number of cases compared to controls; the heterogeneity of the participants' tasks; the frequent lack of comparability between the group of the cases and the group of controls; the lack of plain diagnostic criteria to identify mobbed workers.

Thus, we could deduce that the high heterogeneity found in the results of several subcategories showed by the I^2 is caused by the differences described above and it affects in part the validity of the results.

Our meta-analysis confirms literature data about the variables of the category "Measures of personality", that is the decrease in the belief in justice in mobbed workers, the decrease in the emotional balance, in the self-esteem and in the

positivity in life and the increase in cynicism. The homogeneity of the studies considered for the subcategories "Cynicism" and "Self-esteem and Positivity in Life" corroborates the results. On the contrary, the results of the other subcategories are partially affected by the high heterogeneity, which arouses critical assessment.

In the category "Measures of mental health" it is evident that in mobbed workers the perception of stress is increased, with an impairment of their mental health, up to psychiatric pathologies, such as depression or anxiety disorders, which could drive the victims to extreme gestures as suicide (28, 34). Psychosomatic disturbs were also included in this category, because they were considered a consequence and a demonstration of the impairment of mental health. There are many psychiatric disturbs related to mobbing in literature: maladaptive disorders, depression, anxiety, pre-alarm status, obsessions, panic attacks, isolation (31, 34, 35, 36), eating disorders (37), post-traumatic stress disorder (31, 36, 38), psychosomatic disturbs, stress and generic consequences on mental health (18, 21, 23, 24, 39, 40). The heterogeneity is high in all the subcategories, because of the different ways of selection and evaluation mentioned above.

In the category "Measures of physical health" the subcategory "Impairment of physical health" has a significant value and also the highest sensitivity among all the subcategories (SDM 1.533) showing that victims of mobbing suffer from psychosomatic symptoms (as evaluated in the category above) and real pathological disturbs which may worsen in time.

In the category "Measures of perception of stress at work", the results are significant in the subcategories "Worker's role (negative features)" and "Relations with colleagues and lack of support" (WMD 0.730 and WMD 0.905 respectively). A typical feature of a mobbed worker (19, 41) seems to be the frustration, the lack of personal satisfaction, and the perception of lack of solidarity from colleagues when the role does not respond to expectations and qualities. The statistical validity of this result is also supported by the low heterogeneity ($I^2=0.00$ in both subcategories). The result of the subcategory "Workload" is not significant, showing that workload does not influence mobbing directly, but this result is not supported by literature, where too high a workload or too low a workload is reported as a typical mobbing factor (15).

In the category "Measures of coping strategies" the result is not significant and this let us deduce that there is no difference in the reactions to stressing actions between cases and controls. Thus, mobbed workers do not use particular strategies; maybe, the reaction mainly depends on the victim's personality.

Conclusions

Our meta-analysis shows that mobbing causes effects on the victim's psychic and physical health. For this reason, preventive strategies should be applied to avoid the development of situations which lead to harassment in workplaces. The differences highlighted in literature about the lack of univocal definitions and methods of selection and evaluation show that further studies with standardized methods are necessary to evaluate mobbed workers' features and the damages to their health more objectively, and to implement all possible preventive, organizational, administrative, communicative and personal interventions.

Table 1 - Organization of data

CATEGORY	SUBCATEGORY	VARIABLES
<p>MEASURES OF PERSONALITY</p> <p>Included studies: Gandolfo, 1995; Vartia, 2001; Mikkelsen and Stale, 2002; Coyne et al., 2003; Adoric and Kvartuc, 2007; Glaso et al., 2007; Pompili et al., 2008.</p>	Belief in Justice	Believe in justice and its importance Believe in a just world
	Cynicism	Believe in an unjust world Cynicism
	Emotional balance	Self-control Stability Expansiveness
	Emotional imbalance	Instability Episodes of mania and hypomania (extreme forms of emotional imbalance)
	Self-esteem and Positivity in life	Self-esteem Believe in world benevolence Believe in people benevolence Optimism Confidence Believe in luck
	Lack of self-esteem and Negativity in life	Lack of self-esteem Pessimism Distrust Pliability
	Depression	Depression
<p>MEASURES OF MENTAL HEALTH</p> <p>Included studies: Gandolfo, 1995; Vartia, 2001; Vartia and Hyti, 2002; Agervold and Mikkelsen, 2004; Hoel et al., 2004 ; Pompili et al., 2008.</p>	Stress	Perception of stress General stress Mental fatigue / Burnout (psychological fatigue, concern and aversion for work) Mental reaction to stress (depression, nervousness, difficulty in falling asleep, frequent nocturnal awakening, unusual tiredness) Psychological stress
	Impairment of mental health	Psychosomatic symptoms (stomachache, tachycardia, palpitations, etc.) Global seriousness of symptoms of a mental illness Mental health
<p>MEASURES OF PHYSICAL HEALTH</p> <p>Included studies: Hoel et al., 2004; Gilioli et al., 2005.</p>	Impairment of physical health	Health conditions Quality of life Physical health
<p>MEASURES OF PERCEPTION OF STRESS AT WORK</p>	Workload	Workload Work times

Included studies: Gandolfo, 1995; Vartia and Hyti, 2002; Coyne et al., 2003; Agervold and Mikkelsen, 2004; Gilioli et al., 2005.	Worker's role (negative features)	Work typology Centrality of one's work Clarity of one's role Possibility of taking important decisions
	Relations with colleagues	Little groups that intend to isolate a worker Conflicts or disagreement among workers Typology of relations among colleagues (formal or not)
	Epidemiological measures	Absences due to illness
MEASURES OF COPING STRATEGIES Included studies: Hogh and Dofradottir, 2001; Zapf and Gross, 2001; Mikkelsen and Stale, 2002.	Avoiding behaviours	Avoiding situations that could embarrass the worker
	Other coping strategies	Take the initiative to solve a problem Resign Sag Be pessimist Search for moral support Search for help to solve a problem Compromise one's working situation Try to overcome a conflict Integrate Condescend Post-traumatic stress disease

Table 2 - Features of the selected studies

STUDY	PARTICIPANTS	MEASURED VARIABLES	SUBCATEGORY
Gandolfo, 1995	Total workers: 129 Harassment victims: 47 (mean age 42,1) (62% women) Non-victims: 82 (mean age 42,7) (49% women)	1 - Instability, Episodes of mania and hypomania 2 - Depression 3 - Absences due to illness	1 - Emotional imbalance 2 - Depression 3 - Epidemiological measures
Hogh and Dofradottir, 2001.	Total workers: 1857 (50,8% men, 49,2% women, mean age 40,2) Victims: 35 Controls: 1405	1 - Avoiding situations that could embarrass the worker 2 - Take the initiative to solve a problem, Resign, Sag, Search for moral support, Search for help to solve a problem, Be pessimist	1 - Avoiding behaviours 2 - Other coping strategies

Vartia, 2001	Total workers: 949 (85% women, mean age 40; 15% men, mean age: 41). Victims: 94. Non-victims: 772	1 – Self-esteem 2 – Perception of stress, General stress, Mental fatigue / Burnout, Mental reactions to stress	1 – Self-esteem and Positivity in life 2 - Stress
Zapf and Gross, 2001	Victims: between 139 and 143 (66% women, 44% men; mean age: 45) Controls: 80 (49% women, 51% men; mean age 37)	1 - Avoiding situations that could embarrass the worker 2 - Compromise one's working situation, Try to overcome a conflict, Integrate, Condescend	1 – Avoiding behaviours 2 – Other coping strategies
Mikkelsen and Stale, 2002	Victims: 118 (11 men and 107 women; mean age: 47) Controls: 118 (11 men and 107 women; mean age: 41)	1 - Believe in justice and its importance 2 – Self-esteem, Believe in world and people benevolence, Confidence, Believe in luck 3 – Post-traumatic stress disorder	1 – Belief in Justice 2 – Self-esteem and Positivity in life 3 – Other coping strategies
Vartia and Hyti, 2002	Total workers: 896 (773 men with mean age 41, mean length of service 13; 123 women with mean age 38, mean length of service 9) Victims: 179 Controls: 717	1 – Perception of stress, General stress, Mental fatigue/Burnout, Psychological stress 2 – Mental health 3 – Work typology, Centrality of one's work, Possibility of taking important decisions 4 – Conflicts of disagreement among workers, Typology of relations among colleagues	1 - Stress 2 – Impairment of mental health 3 – Worker's role 4 – Relations with colleagues
Coyne et al., 2003	Total workers: 288 (mean length of service: 12.22) Victims: 50 Controls: 99	1 – Self-control, Stability, Expansiveness 2 - Instability 3 - Pliability 4 – Workload, Work times 5 – Work typology	1 – Emotional balance 2 - Emotional imbalance 3 – Lack of self-esteem and Negativity in life 4 - Workload 5 – Worker's role

Agervold and Mikkelsen, 2004	<p>Total workers: 186 (140 men, 46 women) (Age: 14.5% < 30; 27.4% between 30 and 39; 20.4% between 40 and 49; 37.6% > 50) (Mean length of service: 14)</p> <p>Victims: 25</p> <p>Controls: 161</p>	<p>1 – Psychological stress</p> <p>2 – Psychosomatic symptoms, Global seriousness of symptoms of a mental illness</p> <p>3 - Workload, Work times</p> <p>4 – Work typology, Centrality of one’s role, Clarity of one’s role, Possibility of taking important decisions</p> <p>5 – Little groups that intend to isolate a worker, Typology of relations among colleagues</p> <p>6 – Absences due to illness</p>	<p>1 - Stress</p> <p>2 – Impairment of mental health</p> <p>3 - Workload</p> <p>4 – Worker’s role</p> <p>5 – Relations with colleagues</p> <p>6 – Epidemiological measures</p>
Hoel et al., 2004	<p>Total workers: 5288 (2764 men, 2508 women) (Age: 16 - 70)</p> <p>Victims: 553</p> <p>Controls: 2585</p>	<p>1 – Mental health</p> <p>2 – Physical health</p>	<p>1 – Impairment of mental health</p> <p>2 – Impairment of physical health</p>
Gilioli et al., 2005	<p>Victims: 243</p> <p>Controls: 63</p>	<p>1 - Health conditions, Quality of life</p> <p>2 - Workload, Work times</p> <p>3 - Work typology</p> <p>4 - Little groups that intend to isolate a worker, Typology of relations among colleagues</p>	<p>1 – Impairment of physical health</p> <p>2 - Workload</p> <p>3 – Worker’s role</p> <p>4 – Relations with colleagues</p>
Adoric and Kvartuc, 2007	<p>Victims: 54</p> <p>Controls: 54</p>	<p>1 - Believe in justice and its importance, Believe in a just world</p> <p>2 - Believe in an unjust world, Cynicism</p> <p>3 - Believe in people benevolence, Optimism, Confidence</p> <p>4 – Pessimism, Distrust</p> <p>5 - Depression</p>	<p>1 - Belief in Justice</p> <p>2 - Cynicism</p> <p>3 - Self-esteem and Positivity in life</p> <p>4 - Lack of self-esteem and Negativity in life</p> <p>5 - Depression</p>

Glaso et al., 2007	Victims: 72 Controls: 72	1 - Self-control, Stability, Expansiveness 2 - Instability 3 - Pliability	1 - Emotional balance 2 - Emotional imbalance 3 - Lack of self-esteem and Negativity in life
Pompili et al., 2008	Victims: 47 women, 55 men Controls: 47 women, 55 men	1 - Instability Episodes of mania and hypomania 2 - Depression 3 - Mental health	1 - Emotional imbalance 2 - Depression 3 - Impairment of mental health

Table 3 – Statistical results for each subcategory

CATEGORY	SUBCATEGORY	SAMPLE	P	ES	I ² %	RESULTS
MEASURES OF PERSONALITY	Belief in Justice	290 victims 290 controls	P=0.039	SDM -0.705 [-1.373; -0.037]	87.364	Decreased in victims
	Cynicism	108 victims 108 controls	P=0.001	WMD 0.649 [0.259; 1.039]	0.00	Increased in victims
	Emotional balance	480 victims 578 controls	P=0.047	SDM -0.295 [-0.586; -0.004]	70.473	Decreased in victims
	Emotional imbalance	170 victims 205 controls	P=0.242	SDM 0.490 [-0.331; 1.312]	93.269	Not significant.
	Self-esteem and Positivity in life	698 victims 698 controls	P=0.008	WMD -0.288 [-0.501; -0.074]	0.00	Decreased in victims
	Lack of self-esteem and Negativity in life	126 victims 126 controls	P=0.983	SDM 0.008 [-0.718; 0.734]	87.998	Not significant

	Depression	152 victims 187 controls	P=0.058	SDM 0.888 [-0.031; 1.806]	93.631	Not significant
MEASURES OF MENTAL HEALTH	Stress	417 victims 2583 controls	P=0.00	SDM 0.869 [0.645; 1.093]	72.058	Increased in victims
	Impairment of mental health	732 victims 3302 controls	P=0.000	SDM 0.938 [0.734; 1.142]	77.841	Increased in victims
MEASURES OF PHYSICAL HEALTH	Impairment of physical health	796 victims 2648 controls	P=0.004	SDM 1.533 [0.481; 2.586]	97.449	Increased in victims
MEASURES OF PERCEPTION OF STRESS AT WORK	Workload	50 victims 222 controls	P=0.628	WMD 0.104 [-0.317; 0.526]	0.00	Not significant
	Worker's role (negative features)	125 victims 805 controls	P=0.001	WMD 0.730 [0.301; 1.159]	0.00	Increased in victims
	Relations with colleagues	50 victims 222 controls	P=0.00	WMD 0.905 [0.474; 1.336]	0.00	Increased in victims
	Epidemiological measures	72 victims 243 controls	P=0.877	SDM -0.095 [-1.297; 0.877]	94.532	Not significant
MEASURES OF COPING STRATEGIES	Avoiding behaviours	404 victims 1538 controls	P=0.087	SDM 0.311 [-0.045; 0.668]	75.926	Not significant
	Other coping strategies	774 victims 8708 controls	P=0.503	WMD -0.073 [-0.285; 0.140]	0.00	Not significant

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