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MEDIATION EFFECTS OF SAFETY CLIMATE AND SAFETY MOTIVATION ON THE RELATION BETWEEN ORGANIZATIONAL CLIMATE AND SAFETY PERFORMANCE IN THE WORKPLACE

LAURA DAL CORSO
UNIVERSITY OF PADOVA

The aim of this study was to test whether the effects of organizational climate on safety performance in the workplace are mediated by safety climate and safety motivation. A questionnaire was used. Participants involved in the study were nursing coordinators and nurses working in two hospitals who had already participated in formative activities on clinical risk management. The measures we used were: the scale of organizational climate by De Carlo, Falco and Capozza (2008; affective factor, cognitive factor, and instrumental factor); the scales of safety climate (manager values), safety motivation, and safety performance in the workplace (safety compliance and safety participation) by Neal and Griffin (2006). The mediation hypothesis was evaluated using regression models with observed variables. Findings showed that safety climate performs the function of mediator only in the relationship between the affective factor of organizational climate and safety participation, whereas no mediation effects of safety motivation appeared in the relationship between safety climate and safety performance. Implications of these findings for safety research and their potential applications are discussed.

Key words: Safety climate; Safety motivation; Safety performance; Organizational climate; Clinical risk management.

Correspondence concerning this article should be addressed to Laura Dal Corso, Dipartimento di Psicologia Generale, Università degli Studi di Padova, Via Venezia 8, 35131 PADOVA (PD), Italy. E-mail: dalcorso@unipd.it

INTRODUCTION

The issue of health and safety in the workplace has attracted growing interest in present-day work organization. The profound changes we are witnessing in the work environment, in particular those linked to the concept of flexibility, seem to have a significant effect also on individual and organizational wellbeing, on the quality of the service offered, and on safety (World Alliance for Patient Safety, 2008). Despite the commitment of the different interested parties — legislators, company management, trade union organizations, magistrates, inspectors, individual workers, and service users — accidents at work are an ever present problem, as can be seen by the recent issue of the legislative decree n. 81 of 9 April 2008, concerning health and safety in the workplace, which states that the evaluation of risks "must consider all of the risks for workers' health and safety, including those concerning groups of workers exposed to particular risks, among which those linked to work-related stress" (art. 28). In this evaluation, among other things, it is necessary: to specify the criteria adopted; to indicate the measures of prevention and protection put into practice and the systems of individual protection applied; to set a program of measures considered apt to guarantee the improvement of the levels of safety over time, as well as to identify the members of the organization who are to determine the suitable procedures to be

put into practice. All of the figures appointed and involved in the system (people responsible for prevention and protection, workers' representatives for safety, qualified doctors) must have adequate specific skills and precise responsibilities. Employers, responsible for the enforcement of the contemplated measures, are obliged to carry out a periodic evaluation of the risks, making use of the prevention and protection services and encouraging workers' active participation in determining preventive measures. Workers, on the other hand, are obliged to respect the safety measures taking care of their own health and safety and that of other people with whom they work; moreover, information activities and training are contemplated for the workers themselves.

The set of actions, procedures, and instruments used within organizations to reduce risks, namely to reduce the chances that people fall victim to adverse events, has particular characteristics in the health service sector. Here, there is a tendency to prevent specifically any "damage or inconvenience attributable, even involuntarily, to medical treatments provided during the period of hospitalization, which causes a prolonging of the period of hospitalization itself, a worsening in health conditions or death" (Kohn, Corrigan, & Donaldson, 1999, p. 61). Differently from what normally happens in the majority of organizations, where the tendency is to deal with risks on the basis of objective criteria of the gravity and frequency of the adverse event, in health care centers careful consideration is given to all adverse events — taking into account the ethical and social relevance of their consequences — and the combination of the conditions in which these events occurred. This combination, in fact, may have much more far-reaching consequences, in terms of aetiology and lack of prevention, than the single event.

Therefore, the risk profiles, connected both to the equipment and building, and to health care workers and patients are of a highly dynamic and hazardous nature. These elements imply the necessity for adequate systems of survey, monitoring, communication, information, and formation for internal and external users. In short, safety standards must be guaranteed that are as analytical and global as possible (Cosmi & Del Vecchio, 2003).

The planning and management of the activities aimed to attain these standards constitute clinical risk management, an activity carried out by health care administrators and commonly linked to the following fields of intervention (Pirola, 2003): clinical risks, pertaining directly or indirectly to the clinical-nursing activities carried out by the hospital for patients in hospital/being treated; environmental risks, deriving from the physical condition of the health care structure, from the equipment and plants (fires, explosions, exposure to radiations, magnetic fields, and so on); risks for the safety of health care staff, which include both environmental risks and health risks linked to activities carried out (for instance infections and job-related illnesses); economic-financial risks connected to socio-sanitary and hospital services (payment of compensation or alternatively insurance policies).

Given a combination of aspects which needs to be assumed in relation to clinical risk management, organizational culture is of particular importance, in a perspective of individual and collective enhancement of health care activities. Objectives and actions must, therefore, be specified involving health care workers and patients in the prevention of mistakes, that is the clinical risk, also by promoting the awareness of factors which can hinder such prevention and by developing networks of relations between people, activity, and environment (Wenger, 1998). The most determining risk factors must be eliminated as far as possible, in particular: the excessive attention paid to the immediate causes of the problems, rather than research into wider and more determining causes; the resistance to change caused by the difficulty in questioning convictions,

values, and behaviors which are considered correct; the unsatisfactory levels of communication, information, and formation; excessive confidence in individual and collective competences; the tendency to blame whoever is responsible for the mistake rather than investigate the reasons that determined it.

Considering safety as a basic element for cultural change means promoting activities that can change habits, values, and actions at both an individual and organizational level. Such a project can be achieved only if workers are made responsible and participate personally in the process. As we have already mentioned, also the most recent norm on health and safety in the workplace contemplates the workers' involvement and greater participation in the decisional processes, factors considered highly motivating. In this perspective, it is necessary for those working in this sector to turn their current, prevalently failure-oriented attitude, into a success-oriented one. Indeed, focusing only on negative aspects, mistakes, risky behaviors, reprimands, or punishments is not motivating or functional, especially in the long term, with evident negative effects also on organizational climate. A third aspect concerns the greater attention which should be placed on the processes and behaviors actually taking place rather than on the declared results. Finally, a bottom-up approach to safety should be adopted which contemplates the participation of all of the actors involved through active involvement and making people responsible. To guarantee a greater effectiveness, this model will have to shift from a personal and individual approach to a dimension at the same time enhancing the role of social variables which are able to influence the adoption of unsafe behaviors within work groups and within the entire organization (Russo, 2007; Vincent, 2006).

From what has so far been outlined, it clearly appears that the attention given to diagnostic-therapeutic activities, to equipment, and to the working environment must be supported by a steady commitment toward staff and patients. In particular, the management must pay constant attention — also through specialized professionals — to supporting an organizational culture oriented toward skills which are both scientific-technical and, at the same time, relational, as well as a suitable organizational climate.

As is already known, these two dimensions — organizational culture and climate — are indicated in the literature as important antecedents of the most specific factors of safety culture and climate, which, in their turn, have a significant importance in fostering the adoption of safe behaviors (Guldenmund, 2000).

Organizational climate is a consolidated construct with a long-standing tradition in the field of work and organizational psychology, which in the course of time has kept researchers' interest alive, as is demonstrated by the numerous reviews published over the years up until the present day (James et al., 2008). It is defined as the shared perception of the policies, practices, and procedures, both formal and informal, present within a specific organization (Reichers & Schneider, 1990). Its conceptual roots should be sought in the studies conducted by Mayo and Lewin at the end of the 1930s (Lewin, Lippit, & White, 1939) and, more in general, in the "field theory" (Lewin, 1951) with the introduction of the concept of "atmosphere," a term which refers to "something intangible, a propriety of the overall social situation" (Lewin, 1980, p. 114). We must also mention Argyris' studies (1958), which made the first explicit reference to the concept of "organizational climate," focusing on the dynamics of the process from which organizational climate develops, and McGregor's contribution (1960) of "managerial climate," referring to the influence of management procedures by the direct superior and of other important figures in the

organizational hierarchy, and their competence in determining the climate within the organization. It is, however, to Forehand and von Haller (1964) that we owe the first complete definition of the organizational climate construct, intended as a set of characteristics which, describing an organization and distinguishing it from others, are relatively long-lasting in time, and influence individuals' behavior. Finally, we must consider Litwin and Stringer's contribution (1968), which attempted to attribute a significant weight to both individual and organizational variables and to determine the role of organizational climate on motivation.

It is, therefore, a molar concept indicating the organizational goals and the processes employed to attain them; however, more recently (Schneider, 2001; Schneider & Rentsch, 1988) proposals have been made to consider it a specific, rather than global, construct which has particular referents, for instance, quality, innovation, change, service, or safety. This perspective proves particularly useful whenever the researcher is interested in understanding which variables come into play in predicting a specific result: this is the case of the present work, whose aim is to investigate which factors determine, or contribute in determining, safe behavior in the organizational context. To this end, we need to identify the perceptions relative to one specific aspect of climate, namely the climate for safety.

Some authors have used the term safety climate as a synonym for safety culture, as is demonstrated by the fact that definitions of safety culture exist which are absolutely identical to those of safety climate, whereas others have maintained the necessity of keeping the two constructs distinct (Glendon & Stanton, 2000; Guldenmund, 2000; Mearns & Flin, 1999; Moran & Volkwein, 1992; Wiegmann, Zhang, von Thaden, Sharma, & Mitchell Gibbons, 2002, 2004). The same problems apply to the concepts of organizational climate and organizational culture, to their indiscriminate use, even if they are actually two closely correlated but substantially different constructs (Michela & Burke, 2000; Verbeke, Volgering, & Hessels, 1998; Wallace, Hunt, & Richards, 1999). A possible explanation for these differences pertains to the methods and instruments used to study the two concepts: qualitative for culture and quantitative for climate, as well as the multidimensionality of the latter (Parker et al., 2003). Based on the already mentioned definition by Reichers and Schneider (1990) and adopting a more recent orientation of a cultural type, organizational climate is treated as an element of culture which is placed, with reference to the three levels proposed by Schein (1985), between values and artefacts.

Zohar (1980) introduced the term safety climate, defining it as a particular organizational climate which reflects employees' perception of the importance of safety in the behavior they habitually have in the workplace.

According to Wiegmann, Zang, and von Thaden (2001), safety climate is the temporal measure of the state of safety created by identifying the points in common among the different perceptions of individuals who work in an organization. It refers to the state of safety perceived in a particular place and moment; it is relatively unstable and subject to changes on the basis of the characteristics of the surrounding environment or on the basis of the prevalent conditions. The difference between safety culture and safety climate is therefore represented by the fact that the former is a stable characteristic, resistant to change, of an organization, whereas the latter is a state limited to specific temporal circumstances.

In the case of safety climate, just as for organizational climate, numerous studies have been undertaken with the aim of determining its dimensionality. Reviews of the literature (Clarke, 2000; Flin, Mearns, O'Connor, & Bryden, 2000) allow us to maintain that the number of

components varies, in the same way as the content of the dimensions, in relation to some aspects, among which the sector investigated, the theoretical approach used, and the instruments developed. However, a consensus exists on some main dimensions, such as the commitment of management in matters of safety, the systems of safety management, with particular reference to the workers' perception and satisfaction toward policies and safety procedures adopted, as well as workers' qualitative and quantitative risk perception.

The study by Seo, Torabi, Blair, and Ellis (2005) reported numerous measurement scales built to examine safety climate in different organizational contexts. Over the last few years, within a growing interest in patient safety and the promotion of assistance quality in health care organizations, several works have been published which describe and compare instruments, useful to researchers and doctors in evaluating the safety climate (Colla, Bracken, Kinney, & Weeks, 2005; Flin, Burns, Mearns, Yule, & Robertson, 2006). The health care environment, indeed, presents characteristics differentiating it from other organizational contexts, such as: the heterogeneity of categories of people exposed to risk (patients, technical and administrative personnel, suppliers, the public); the variety of technical components used; the complexity of the formal obligations of people responsible for the health care structure; the high degree of expertise of health care workers, and their level of autonomy on decisions. Moreover, the critical nature of the service provided which, concerning the protection of people's health, is subjected to particular guarantees (because of its specific juridical nature), and finally the fact that health care services present an intrinsic risk of damage to people (Dal Corso, De Carlo, & Salmaso, 2008).

Even though in literature there is agreement on the opportunity of integrating qualitative and quantitative methods in measuring safety climate, in fact the main instruments set up to measure it are self-report questionnaires (Guldenmund, 2007), considered particularly useful in a prevention perspective, namely before accidents and injuries occur. Some of these instruments refer to the numerous dimensions composing the safety climate, others instead aim at a global measure of safety climate, which is particularly interesting whenever the general perceptions of this construct need to be evaluated (Hahn & Murphy, 2008).

Safety climate, in different work contexts, has been studied as an independent variable, a dependent variable, or in the role of mediator or moderator. Indeed, the studies by Naveh, Katz-Navon, and Stern (2005) and by Katz-Navon, Naveh, and Stern (2005) underlined the complexity of the relationship between the different dimensions of safety climate, in their influence on safety performance, intended as treatment errors in health care.

In describing the relation between safety climate and safety behavior, Johnson (2007) observed that several authors, among whom Cooper and Phillips (2004), underlined the lack of a direct link connecting safety climate and safe behavior, whereas others, for instance Mullen (2004), detected this link in their studies.

Some particularly interesting findings have also emerged from the recent meta-analysis by Clarke (2006), which investigated the complex relationship existing between safety climate and safety performance, through a comparison of thirty-five studies containing a measure of safety compliance, safety participation, or both, and a measure of accident involvement.

Siu, Phillips, and Leung (2004) examined the relationship existing between safety climate, in its dimensions of safety attitudes and communication, and safety performance, intended as self-reported accident rates and occupational injuries, hypothesizing the role of psychological strains (psychological distress and job satisfaction) as mediators. Findings supported the hypothe-

ses only partly: in fact, safety attitudes predict occupational injuries, and psychological distress predicts accident rates whereas only psychological distress performs the role of mediator between safety attitudes and accident rates.

The complex nature of the relationship between safety climate and safety behavior was also highlighted by the results obtained by Seo (2005), which indicated that safety climate is the best predictor of unsafe work behavior. Indeed, safety climate influences unsafe work behavior directly, or through the sequential influence of other factors such as perceived work pressure, perceived risk, and perceived barriers, or again through the influence on perceived barriers, which in their turn influence unsafe work behavior.

Huang, Ho, Smith, and Chen (2006) confirmed the role of safety climate as a critical factor predicting the occurrence of self-reported occupational injury and the mediator effect of employee safety control in the relationship between safety climate and self-reported injury.

Pousette, Larsson, and Törner (2008) tested the predictive validity of safety climate on self-reported safety behavior.

Among the research contributions investigating the antecedents of safety climate, intended as a dependent variable, DeJoy, Schaffer, Wilson, Vandenberg, and Butts (2004) identified them in environmental conditions, in safety-related policies and programs, in organizational support, and in organizational climate; Wu, Liu, and Lu (2007) recognized them in organizational factors, such as ownership, safety manager, safety committee, and in individual factors, such as gender, age, title, and accident experience.

The evidences of a mediated relationship between safety climate and safety performance are more numerous. The study by Neal, Griffin, and Hart (2000), investigating the impact of organizational climate on safety climate and safety performance is particularly interesting. The authors proposed a model individuating two dimensions in safety performance: safety compliance, which "involves adhering to safety procedures and carrying out work in a safe manner" (p. 101), and safety participation, which "involves helping co-workers, promoting the safety program within the workplace, demonstrating initiative, and putting effort into improving safety in the workplace" (p. 101). The results obtained indicated that: organizational climate predicts safety climate; the effects of organizational climate on safety performance are mediated by safety climate; the effects of safety climate on safety performance are mediated by safety knowledge and safety motivation. In particular, a direct effect of safety climate on safety participation emerged. The hypothesis of a stronger relationship between safety motivation and safety participation was not confirmed, whereas that of a stronger relationship between safety knowledge and safety compliance was. Finally, the hypothesis that safety climate, safety knowledge, and safety motivation mediate the relationship between organizational climate and safety performance was confirmed. The interest in studying the relations between safety climate, safety motivation, and safety performance in terms of safety compliance and safety participation was also demonstrated by the most recent study by Neal and Griffin (2006).

DeJoy et al. (2004), in one of their already mentioned studies, analyzed the mediating role of safety climate in the relationship between the three categories of work situation factors and perceived safety at work.

The study by Clarke and Ward (2006) highlighted mediator effects of safety climate in the relationship between leader's influence tactics and employees' safety participation, whereas

Wu, Chen, and Li's study (2008) highlighted these effects in the relationship between safety leadership and dimensions of safety performance.

Some authors have analyzed the role of safety climate in moderating the effects of job insecurity on safety outcomes in terms of safety knowledge, compliance, accidents and injuries (Probst, 2004), others have wondered whether safety climate may moderate the influence of staffing adequacy and work conditions on nurse injuries (Mark et al., 2007), still others have hypothesized that the relationship between safety climate and both medication errors and nurse back injuries is moderated by the complexity of the patients' conditions on the unit (Hofmann & Mark, 2006), or suggested the necessity of further studying the role of possible moderators in the relationship between safety climate and safety performance (Clarke, 2006).

The aim of the present study was to analyze the relations between safety climate, safety compliance, and safety participation. It was hypothesized that safety climate is predicted by organizational climate and that safety motivation totally or partially mediates the effects of safety climate on safety performance, in terms of safety compliance and safety participation. To test the mediation hypothesis a study was performed — using a questionnaire — inside two hospitals. The mediation hypothesis was evaluated using regression models with observed variables (LISREL 8.71; Jöreskog & Sörbom, 1996-2001).

METHOD

Participants and Procedure

The study was carried out in two hospitals in North-East Italy in collaboration with their Quality and Clinical Risk Operative Units. Participants were nursing coordinators. The instrument used was a questionnaire which was handed to each participant, chosen according to the criterion of having already taken part in initiatives of formation on risk management with the prospect of improving the quality of treatment and organization in different hospitals. After individually filling out the questionnaire, participants handed it back, in a sealed envelope to guarantee complete anonymity, to the lead nurse. Two-hundred and thirty-one questionnaires were collected; 81.9% of the participants was female and 18.1% male. With regards to age, 27.8% of the respondents was aged between 35 and 39, 25.1% was over 45, 23.3% was aged between 40 and 44, 13.2% between 30 and 34, 10.6% was under 30. As for education, 64.8% had a secondary school/professional qualification, 31.7% a degree, and 3.5% only an elementary/junior high school diploma.

Concerning work experience, 25.6% had more than 21 years of experience gained within the organization, 23.3% had between 13 and 20 years of experience, 20.7% between 3 and 7 years, 18.1% between 8 and 12 years, 6.6% between 1 and 2 years, 5.3% between 6 and 11 months and only 0.4% had a working experience of less than 6 months. Regarding experience gained in the role currently held within the organization, 29.9% had between 3 and 7 years of experience, 23.2% between 8 and 12 years, 21% between 13 and 20 years, 13.8% over 21 years, 6.3% between 1 and 2 years, 5.4% between 6 and 11 months and only 0.4% less than 6 months.

Measures

The questionnaire included various scales. In this study only the scales relative to the constructs considered will be described.

Organizational climate. To measure this construct items were taken from the scale of organizational climate (De Carlo, Falco, & Capozza, 2008). The scale used was composed of 28 items, divided into 13 dimensions. Twelve dimensions, organized into three higher order factors (affective, cognitive, instrumental) were taken from Ostroff's model (1993), considered to be the most complete and comprehensive compendium of studies on climate (Carr, Schmidt, Ford, & DeShon, 2003). The affective factor (including the dimensions participation, warmth, social rewards, cooperation, communication) referred to the social and interpersonal relationships between workers. Examples of items referring to the affective factor are: "The staff are involved in defining objectives and in the decisional processes," "There is a climate of listening and of reciprocal trust," "The direct superiors manifest appreciation for a job well done," "Among colleagues there is support, solidarity, and mutual help," " Information is easily accessible to all of the staff." The scale's α reliability in this study was .89. The cognitive factor (constituted by the dimensions growth, innovation, autonomy) concerned the perceptions relative to psychological involvement in the workplace. Examples of items referring to the cognitive factor are: "The professional growth of each employee is favored," "People are open and well disposed toward innovations and change," "Each employee enjoys a good degree of autonomy." The scale's α reliability in this study was .80. The instrumental factor (composed of the dimensions hierarchy, structure, extrinsic rewards, orientation toward success) referred to the most typically structural aspects of the organization linked to working processes. We proceeded adding the dimension "technology" in the ambit of the instrumental factor, in that it is an important variable in the safety sector in a health care environment. Examples of items referring to the instrumental factor are: "There is a rigid division of roles," "Precise operative procedures are followed," "A pay policy is promoted which motivates employees," "Employees are urged to give their best at work," "Each employee is equipped with adequate technological instrumentation." Responses were given on a six-level Likert scale, from 1 (*strongly disagree*) to 6 (*strongly agree*) with the response option *cannot evaluate* outside of the scale. The scale's α reliability in this study was .72.

Safety climate. We considered the component manager values (Griffin & Neal, 2000), which was measured through three items formulated by Neal and Griffin (2006). An example item is "Safety is given high priority by management." Employees responded to the three items on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) with the response option *cannot evaluate* outside of the scale. The scale's α reliability in this study was .91.

Safety motivation. To examine this variable three items, formulated by Neal and Griffin (2006), were used which measure the extent to which individuals viewed safety as an important part of their work life. An example item is "I believe that it is important to reduce the risk of accidents and incidents in the workplace." Employees responded to the three items on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*), with the response option *cannot evaluate* outside of the scale. The scale's α reliability in this study was .74.

Safety performance. We considered the components safety compliance (e.g., "I use the correct safety procedures to carry out my job") and safety participation (e.g., "I voluntarily carry out tasks or activities that help to improve workplace safety"), each one measured through three

items proposed by Neal and Griffin (2006). Participants indicated their agreement to the three items on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) with the response option *cannot evaluate* outside of the scale. The Cronbach alphas, relative to the measures of safety compliance and safety participation, were equal, respectively, to .74 and .88.

RESULTS

Test of Mediation Models

To test the mediation effects of safety climate, we evaluated regression models with observed variables. We proposed testing the effects of the affective, cognitive, and instrumental factors of organizational climate on the safety compliance and safety participation dimensions, hypothesizing a mediational effect of safety climate (Figure 1). Later, the safety motivation variable was introduced into the model, hypothesizing that in its turn it mediates the relationship between safety climate and the two components of safety performance (Figure 2).

Analyses were performed by testing a model which predicted a link between the three components of organizational climate and safety climate, and a link between safety climate and safety compliance, as well as safety participation. Figure 1 reports the findings of the tested model, representing only the significant coefficients. This model fits the data well: χ^2 (6) = 2.02, p = .92; RMSEA = .00; CFI = 1.00; SRMR = .026, as appears from all of the goodness-of-fit indices.

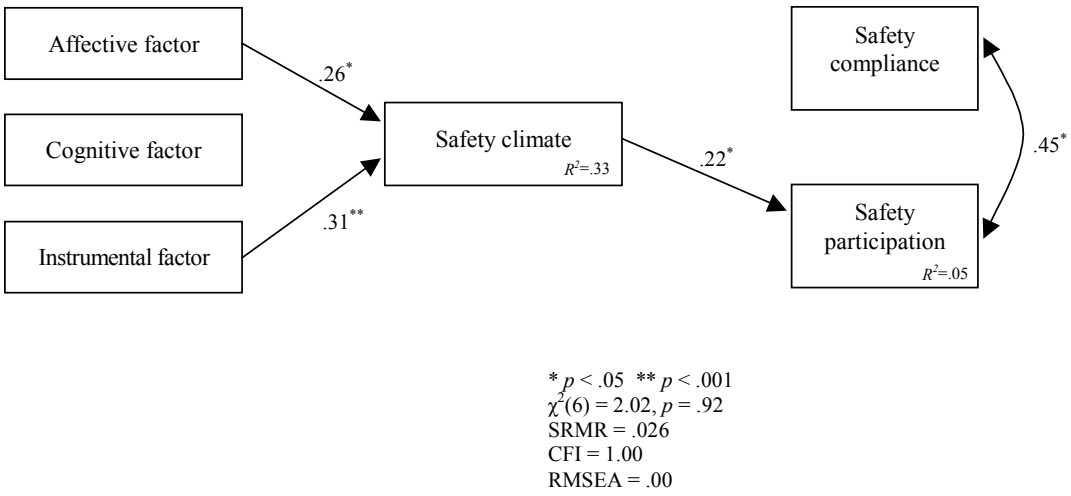

FIGURE 1
The mediational effects of safety climate, criterion-variables:
Safety compliance and safety participation.

Findings indicated that the affective and instrumental factor of organizational climate influenced safety climate. No effects of the cognitive factor emerged. The two predictors explained

a safety climate amount of variance of .33. It is interesting to note that safety climate fostered safety participation ($\beta = .22$, $p < .05$), but not safety compliance ($\beta = .10$, *ns*).

We proceeded in the analyses by testing whether safety climate mediated the effect of the exogenous variables on safety participation.

In the model of Figure 1 we freed the γ linking the affective factor to the criterion-variable. The gamma was nonsignificant ($\gamma = –.02$, *ns*), namely the impact of the affective factor was totally mediated by safety climate.

As regards the instrumental factor, the direct γ was nonsignificant ($\gamma = .08$, *ns*); moreover, when the direct effect was tested, the β, linking safety climate with safety participation, became nonsignificant. For this factor, the mediation hypothesis was not supported.

Therefore, safety climate totally mediated only the relationship between the affective factor and safety participation, partly confirming the findings obtained in earlier studies (Neal & Griffin, 2006; Neal et al., 2000). The more emphasis is placed on safety in the workplace and the more it is considered a company priority, the more employees are committed to increasing the levels of safety through spontaneous actions as well. In this study safety climate was positively influenced by the affective and the instrumental factor of organizational climate, in keeping with the reference literature (DeJoy et al., 2004).

A series of factors ensure that workers recognize safety as the primary goal. First of all, the perception of being involved in decisional processes and in the definition of organizational goals. Other important factors are: the perception of friendly and informal relations; the perception of support from both the management and colleagues/co-workers; the perception of appreciation for having worked well. But also important is the awareness of the significance attributed to: the respect of hierarchies, directions and formalized procedures, a fair pay policy taking into account skills and commitment. Finally, we have to consider the perception of being part of an organization which is interested in quality, and inclined toward a continuous improvement of services.

We then proceeded testing the hypothesis of mediation of safety motivation in the relationship between safety climate and the two components of safety performance. Figure 2 reports only the significant coefficients. This model fits the data well: χ^2 (11) = 8.71, $p = .65$; RMSEA = .00; CFI = 1.00; SRMR = .039, as appears from all the goodness-of-fit indices. Safety motivation fostered both safety participation ($\beta = .21$, $p < .05$) and safety compliance ($\beta = .33$, $p < .001$). As already reported by Neal et al. (2000), the effect produced by safety motivation on safety compliance was greater than that produced on safety participation. Concerning safety climate, the data did not indicate a direct effect on safety motivation ($\beta = .06$, *ns*). Therefore, whether safety motivation mediated the relation of safety climate on the criterion-variables could not be tested.

Regarding the affective, cognitive, and instrumental factors of organizational climate, the model of Figure 2 was tested adding the direct effects of the three components on safety motivation: χ^2 (8) = 8.22, $p = .41$; RMSEA = .00; CFI = 1.00; SRMR = .058. In this test, the three components of organizational climate turned out not to influence safety motivation (respectively, $\gamma = .03$, *ns*; $\gamma = .02$, *ns*; $\gamma = –.02$, *ns*). The hypothesis that safety motivation can mediate the relationship between safety climate and the two criterion-variables is therefore not confirmed.

The influence of affective and instrumental organizational climate on safety climate and the influence of safety motivation on the two components of safety performance can thus be considered as the result of two separate processes.

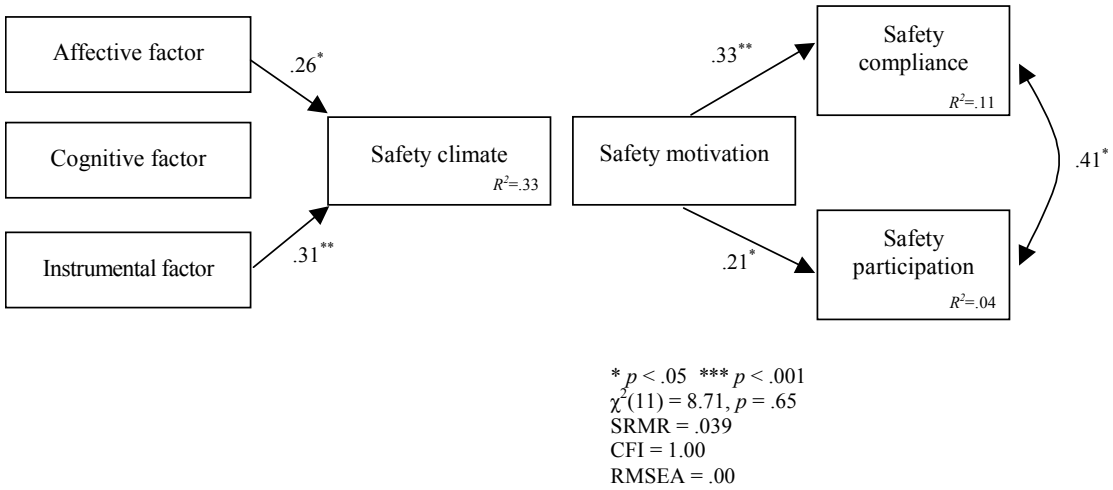

FIGURE 2
The mediational effects of safety climate and safety motivation, criterion-variables: Safety compliance and safety participation.

DISCUSSION

The aim of the present study was to test the effects that organizational climate has on safety performance in terms of safety compliance and safety participation. It was hypothesized that the effects of organizational climate on the criterion-variables considered are mediated by safety climate and safety motivation. These hypotheses were tested in a study carried out on nursing coordinators and nurses operating in two hospitals. The results obtained only partly confirmed the hypotheses. It in fact emerged that safety climate mediated only the relationship between the affective factor of organizational climate and the safety participation. The perception of being involved in the decisional processes and definition of organizational goals, the existence of friendly and informal relations in the working environment, of support from both management, colleagues and co-workers, and the appreciation for having worked well encouraged employees to put into practice actions of their own, aimed to increase the safety level of their work context, because these climate factors incite employees to consider safety as a primary goal.

It appears that safety climate is influenced by the affective and instrumental factors of organizational climate, consistent with the literature. In relation to the effects, it has emerged that safety climate positively influences safety participation but not safety compliance. The results obtained in other studies, therefore, are only partly confirmed.

Finally, we proceeded with testing the mediation effect of safety motivation in the relationship between safety climate and safety performance: the results obtained, however, did not confirm this hypothesis, but showed a positive effect of safety motivation on the two criterion-variables. The more employees think it is worth committing themselves to maintaining and, if possible, increasing safety in every aspect of their work, thus reducing risks of accidents, the more they are induced to respect safety procedures, use the equipment prescribed by the norms, guarantee high standards of safety, and promote it through a personal and voluntary commitment.

The absence of a mediational effect of safety motivation in the relationship between safety climate and safety performance, an interesting but unusual result, leads us to consider the influence of organizational climate on safety climate and of safety motivation on safety performance as two distinct processes and points in the direction of further studies considering the role of other variables at both an organizational and individual level.

On this basis an opening exists for new research and formative interventions. Valorizing the skills of professionals in health care services is indeed a necessary means to ensure effective treatments and, to this end, formation constitutes a necessary and preferential instrument. Formation should be considered not so much for its content-centered technical-professional nature, but more centred on people, their "transversal" competences, and above all their motivation (Delvecchio, 2005). In order to be effective, such a safety formation must be "transformative" (Mezirow, 1991): that is it must stimulate health care workers to reflect — keeping their experience into great account — on unknown situations, question operational modes, applied to such situations, modify their own way of thinking and behaving (Schön, 1983), in relation to safety, and finally lead them to consider a mistake as a possibility of learning (Reason, 1997).

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