

## VIEWPOINT

# Climate and cultural aspects in intensive care units

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### Abstract

Research carried out in the field of work and organisational psychology shows that work unit climate and culture are important determinants of work unit performance. We briefly summarise what we have learnt about the climate-performance relationship in work units distinct from ICUs. Then, we show how the ICU culture can be measured, and summarise research on the culture-performance relationship in ICUs.

For the World Health Organization, the definition of health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity [1]. As a consequence, the scope of quality of care has broadened and should consider not only mortality but also other dimensions of performance, such as satisfaction of the patient and his/her family, long-term quality of life and functional recovery. Moreover, financial constraints on ICUs are increasing, justifying integrating this dimension in the global assessment of ICU performance, but with potential drawbacks and ethical concerns [2,3]. This raises the issue of rationing health care [4,5], with potential conflict arising in teams if values are not shared and consensus is not reached.

Intensive care medicine is expanding in all western countries [6] but with large heterogeneity in the number of beds [7] as well as in organisation and management. It includes several specificities mostly related to uncertainty (unplanned activities), urgent situations, stressful environments and high mortality rate. Groups of people are involved directly or indirectly in patient care (physicians, nurses, nurse's aids, physiotherapists, clerks, and janitors), and these multidisciplinary ICU teams are at risk of making errors resulting from cooperation-communication failures. As a matter of fact, several studies have

documented that iatrogenic events are frequently reported in ICUs [8,9] and that a good management and safety culture is able to reduce the rate of medical errors [10].

In order to reduce the number of adverse events and to improve patient outcome globally, a climate and culture of safety and quality have to be implemented in ICUs. Several factors hinder this approach, however, such as dictatorial behaviour, lack of mutual respect, and fears of being stigmatised. New technology (for example, fancy ventilator or dialysis machines) has little chance of improving patient outcome if a team-oriented culture is not promoted in ICUs.

This collaborative article is structured as follows. First, we define the concepts of work unit climate and culture. Second, we briefly summarise what we have learnt about the climate-performance relationship in work units from the field of work and organisational psychology. Third, we focus on how unit culture can be measured in ICUs and summarise research on the aforementioned relationship in ICUs. Finally, we present a number of conclusions.

### ICU climate and culture

Organisational theory and research have shown that work units' climate and culture exert important influences on work units' outcomes, such as unit performance [11,12]. Climate refers to work unit members' shared perceptions about the policies, procedures, and practices that are implemented in their work environment. According to their content, these shared perceptions can be clustered in homogeneous groups called climate facets (such as service climate or safety climate). Depending on the work unit's activity, some climate facets can have more strategic importance than others; for instance, a high service climate in a hospital is crucial for achieving high levels of patient satisfaction. Culture refers to a system of shared values, assumptions, and underlying beliefs that influences the way of doing things in work units [13]. According to the values, assumptions, and underlying beliefs that characterise a given unit, distinct types of culture can be specified (for example, clan culture, market culture, constructive culture).

Climate and culture are two interrelated concepts. The elements that form a unit's culture determine the policies and procedures supported by managers [14]. For instance, in a hospital where providing a high quality

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service is an important and shared value, managers provide training to health professionals about how to interact with patients and their relatives. Once those policies and procedures are translated into implemented practices and are socially interpreted by unit members, climate perceptions develop and emerge. In the aforementioned hospital, the participation of health professionals in training courses aimed at increasing service quality through the development of better social skills should lead to a high level of service climate. Thus, a work unit's climate also provides a way to learn about its culture [15].

### **Unit climate and performance**

Work unit climate provides a shared representation of the work environment that enables team members to assign shared meaning to events that are important for the unit, and to determine the actions that will lead to desired outcomes [16,17]. These ideas have led researchers to posit that unit climate is related to unit performance, which is one of these desired outcomes.

There is some empirical evidence supporting the relationship between unit climate and different indicators of unit performance across different types of work units and involving different climate facets [11,18-20]. For instance, Schneider and colleagues [20], in a sample of bank branches, found that service climate positively predicted subsequent customers' assessments of service quality. Zohar [18] found in a sample of work groups from a manufacturing company that safety climate was negatively related to work groups' injury rates. Finally, González-Romá and colleagues [21] found in a longitudinal study using a sample of bank branches that support climate (the extent to which policies, procedures, and practices foster support from the organisation and their managers) was positively related to branch members' and branch managers' ratings of unit performance over time.

### **The moderator role of climate strength**

Recent research has shown that the relationship between work unit climate and unit outcomes is moderated by climate strength (that is, the degree of within-unit agreement of employees' climate perceptions). This research assumes that a unit's climate can be characterised not only by the average of unit members' climate scores (that is, the climate level) but that climate strength has to be taken into account as well. In several studies [19,21-24], the moderator influence of climate strength was in the expected direction - climate strength fostered the relationship between work units' climate and outcome variables - so that when climate strength was high, the relationship was enhanced, whereas when climate strength was low, the relationship was weakened.

For instance, González-Romá and colleagues [22], in a sample of public health service units, found that climate strength moderated the positive relationship between innovation climate (the extent to which policies, procedures, and practices foster new ideas about work and their implementation) and unit satisfaction and commitment. Schneider and colleagues [23], in a sample of bank branches, found that climate strength moderated the impact of branch service climate on customer perceptions of service quality. Finally, in the aforementioned study carried out by González-Romá and colleagues [21], climate strength moderated the relationship between the climate facets of support and innovation on the one hand and subjective and objective (financial) indicators of unit performance on the other. Interestingly, the relationship between branch climate and financial performance was observed only in branches with high climate strength. This result suggests that in order for unit climate to be related to subsequent financial unit performance, unit climate must be strong (that is, there must be a high degree of within-unit agreement of employees' climate perceptions).

Theoretically, the moderator influence of climate strength on the team climate-team performance relationship has been based on Mischel's [25] concept of situational strength. Situational strength refers to the degree of ambiguity present in the context. Strong situations lead people to interpret events in a similar way, induce uniform expectancies regarding the most appropriate behaviour, and provide adequate incentives for the performance of that behaviour. In strong situations, behavioural variability will be small [25,26]. Weak situations are not uniformly interpreted, do not produce uniform expectancies regarding the desired behaviour, and do not provide sufficient incentives for its performance [25]. In weak situations, behavioural variability will be large [25,26]. Therefore, unit climates with high climate strength (strong climates) foster uniform and consistent performance-related behaviours, whereas in units with a weak climate (low climate strength), the variability of performance-related behaviours is larger. This affects the predictability of team performance such that it will be more predictable in strong climate conditions than in weak ones [27]. Low climate strength means that idiosyncratic work unit perceptions develop within a unit, which produce wide variability in individual behaviours, diminishing the relationship between unit climate and unit performance [14]. Moreover, in work units where functional interdependence is important, coordinated action is required to carry out the unit's tasks and achieve the unit's goals. This coordinated action is facilitated when unit members agree on the meaning of important elements (policies, procedures, and practices) of their work environment (that is, when climate strength is high).

### **The antecedents of climate strength**

If climate strength enhances the relationship between unit climate and unit performance, it makes sense to identify the antecedents of climate strength. Several studies have underlined the role of the work unit leader in this regard. Through leader-member interaction and communication, leaders can contribute to fostering within-unit agreement regarding climate perceptions (that is, climate strength). In these interactions, leaders may inform unit members about policies, procedures and practices. Considering that leaders may serve as interpretive filters of relevant work unit events, features, and processes [28], it is reasonable to expect that leaders, by means of this communication behaviour, will shape unit members' perceptions of the unit, promoting climate strength. Empirical research supports this relationship. González-Romá and colleagues [22] found a positive relationship between unit leaders' informing behaviour and climate strength in a sample of public health service units.

Other aspects of unit leaders' behaviour also influence climate strength. Zohar and Luria [29] observed that variability in leaders' behavioural patterns was negatively related to safety climate strength, whereas simplicity of leaders' behavioural patterns was positively related. Finally, Naumann and Bennet [30] found that visibility of work units' supervisors was positively related to climate strength. These empirical findings show that unit leaders play a crucial role in shaping the climate of their work units.

The relationships between the level and strength of work unit climate and a number of antecedents (for example, leaders' behaviour) and consequences (for example, unit performance) have been documented in distinct types of work units (for example, bank branches, health units, manufacturing work groups); however, there is a scarcity of research examining these relationships in ICU samples. The high degree of interdependence that these units show suggests that the aforementioned relationships should also operate in ICU samples.

### **Analytical framework and tools to assess ICU culture and organisation**

The concept developed in industry builds a strong background for a proof of concept but does not necessarily translate to the ICU environment; the working hypothesis is thus largely speculative.

#### **Framework**

Safety culture might be defined as 'the product of individual and group values, attitudes, perceptions, competencies, and patterns of behaviour that determine the commitment to, and the style and proficiency of, an organisation's health and safety management.' Culture

and climate are measured at the individual level, but the two concepts are operationalised at the group unit level. Culture refers to shared values and climate to shared perceptions. The definitions used are summarised in Table 1.

Figure 1 summarises the relationship between all these factors. It must be stressed that although it is well documented in other fields (see above), the relative contribution of each factor to the final outcome is unknown in ICU samples. More importantly, very few data link an intervention aiming at improving one of the factors and performance.

The model has been adapted over a 20-year period for the ICU environment. The first study by Shortell and colleagues [31] established the basic framework for the culture-outcome relationship in ICUs. It was used by Miranda and colleagues in the EURICUS (European ICU Studies) project [32], then promoted by the Society of Critical Care Medicine in the USA [33], refined in our own study [34], and integrated in a global perspective of team performance for ICUs [35]. It must be stressed that other factors contribute to performance in ICUs, such as equipment, external control, incentives, and public release of performance indicators.

The multiplicity of factors and the paucity of data in ICUs explain that the presented model/framework is not fully validated. As discussed later, however, a shared climate on a strategic facet (for example, service, safety) and a team-oriented culture are able to improve organisation and contribute to better well-being of staff members. As a consequence, it is desirable to implement a team-oriented culture. To do so, a first step for ICU directors is to assess the current culture of their units using a validated questionnaire encompassing all dimensions of culture and organisation.

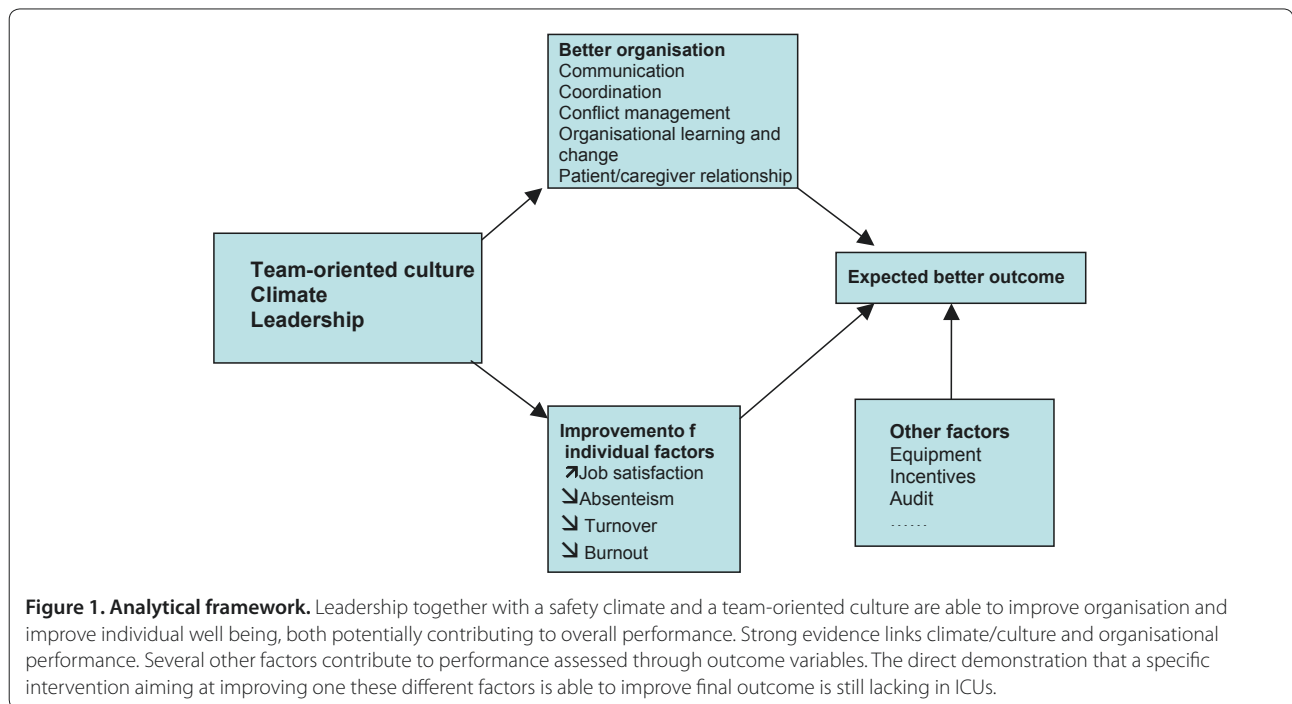
#### **Questionnaires**

Many questionnaires have been developed in order to assess culture and team processes in ICUs. The first was developed by Shortell and colleagues [31], whose study included 42 ICUs and over 1,700 respondents and provided evidence for the reliability and validity of a comprehensive set of measures related to leadership, organisational culture, communication, coordination, problem solving-conflict management and team cohesiveness. The data also supported the appropriateness of aggregating individual respondent data to the unit level.

The EURICUS-I project expanded the Shortell questionnaire and included 89 ICUs in 12 European countries [32]. The questionnaires of Shortell and colleagues and Miranda and colleagues were not fully validated and did not consider some important aspects of management. Other questionnaires are available, such as Safety Attitudes Questionnaire-ICU [36], which is derived from

**Table 1. Definition of items used in the manuscript**

| Items                      | Definition  |
|----------------------------|---|
| Climate [11,13]            | Work unit members' shared perceptions about the policies, procedures, and practices that are implemented in their work environment                                  |
| Climate strength           | The degree of within-unit agreement of work unit members' climate perceptions   |
| Culture [14,38]            | System of shared values, assumptions and underlying beliefs that influences the way of doing things in work units   |
| Service climate [11]       | Shared perceptions of the policies, practices, and procedures that are rewarded, supported, and expected concerning customer/user service                           |
| Safety climate [11]        | Shared perceptions of the policies, practices, and procedures that are rewarded, supported, and expected concerning safety in the unit's operations and functioning |
| Leadership [28]            | Involvement in setting the framework, the values and the mission of the team, and in coordinating action  |
| Working conditions [31-35] | Perceived quality of the work environment and logistical support  |
| Job satisfaction [31-35]   | Positivity about the work experience  |
| Burnout [39]               | Emotional exhaustion<br>Depersonalisation<br>Personal accomplishment  |
| OCI [38]                   | Organizational Culture Inventory  |
| COMIC [34]                 | Culture Organization and Management in Intensive Care   |
| SAQ [36]                   | Safety Attitude Questionnaire   |



the cockpit management attitude questionnaire [37]. We developed a questionnaire named COMIC (for Culture, Organisation and Management in Intensive Care) [34] that combines a set of independent variables that include cultural, managerial, well-being, and unit effectiveness dimensions in order to give an integrative overview of the 'organisation' variable.

The COMIC questionnaire provides a 13-item measure of ICU culture based on the Organisational Culture Inventory [38]. A team-satisfaction-oriented culture is expected to be positively correlated with more effective managerial practices, whereas people-security and task-security cultures would be negatively associated with the development of effective managerial practices [38].

Relations with patients and family members should be assessed together with individual well-being with a specific focus on burnout, which is measured with the Maslach Burnout Inventory [39].

### **ICU culture/climate and performance**

#### **Studies that have examined the relationship between culture/climate and ICU performance**

Based on data collected from 17,440 patients across 42 ICUs, Shortell and colleagues [40] were able to reveal that caregiver interaction comprising the culture, leadership, coordination, communication, and conflict management abilities of the unit is significantly associated with lower risk-adjusted length of stay, lower nurse turnover, higher evaluated technical quality of care, and greater evaluated ability to meet family member needs. In another study from the same group [41], 3,045 eligible coronary artery bypass graft surgery patients were analysed. Total quality management was implemented and organisational culture was measured. A two- to four-fold difference in all major clinical coronary artery bypass graft surgery care endpoints was observed among the 16 hospitals, but little of this variation was associated with total quality management or organisational culture. High total quality management was associated with more satisfaction with nursing care but with a longer length of stay.

In the study of Huang and colleagues [42], culture scores were low to moderate. After adjustment for patient, hospital and ICU characteristics, for every 10% decrease in ICU perceptions of management percent-positive score, the odds ratio for hospital mortality was 1.24. However, other dimensions of safety had no impact on mortality (stress recognition, job satisfaction, working conditions, team climate). For every 10% decrease in ICU safety climate percent-positive score, the length of stay increased 15%.

We analyzed the answers to the COMIC questionnaire of 1,000 ICU personnel from 26 ICUs located in the Paris area (750 nurses, 26 head nurses, 168 physicians and 56 medical secretaries) [43]. A team-satisfaction-oriented culture correlated positively with all measures of effective managerial practices, while task-security- and people-security-oriented cultures correlated negatively with effective managerial practices. Team-satisfaction-oriented culture was positively associated with all measures of individual well-being. Overall, there was a positive relationship between team-satisfaction-oriented culture and good managerial practices on the one hand and between the absence (or low level) of burnout and good job satisfaction on the other hand. Organisational performance was assessed through a composite score related to five dimensions: coordination and adaptation to uncertainty; communication; conflict management;

organisational change and organisational learning; and skills developed in relationship with patients and their families. The multilevel analysis assessing the respective contribution of structural, contextual and individual factors to the organisational score showed that only 9.5% of the variation was due to ICU-level factors. At the individual level, the significant variables were lack of burnout, satisfaction to work, and older mean age, while at the ICU level a high physician and nurse-to-bed ratio and an important workload per day were significant. All these factors were positively correlated with organisational performance. If we consider the interactions between burnout, organisational performance, and high workload per day, the results suggest two interpretations: that a high level of organisational performance supports a high workload and prevents burnout; and that a high level of organisational performance supports a high workload without thinking about burnout.

In another study, the authors were unable to find an association between organisational culture, team climate, or preventive quality management at the ward level and the prevalence of nosocomial pressure ulcers [44].

Sexton and colleagues [45] studied the impact of implementing a unit-based safety program in 71 ICUs to improve unit safety culture, such as teamwork and safety climate. The safety climate was assessed with the Safety Attitude Questionnaire (SAQ). Overall, mean safety climate scores improved, with scores higher in faith-based ICUs and smaller hospitals. However, the conclusion of the work was 'research linking improved climate and clinical outcomes is a critical next step'.

#### **Difficulties in demonstrating an impact on patient outcome**

A recent review concluded that even if some evidence existed, articulating the nature of the relationship between culture/climate and ICU performance was difficult and stated that 'In particular, stronger methodological definitions and operationalizations of both culture and outcomes were recommended' [46].

The culture-outcome relationship is very difficult to assess for several reasons: besides culture/climate, several factors (case mix, environment, financial constraints) might contribute to the final outcome (that is, mortality, morbidity, length of stay, and so on). There is a general concern about the best performance indicator for ICUs; no validated composite performance score is available that enables a single dependant variable to be used in a statistical model. Moreover, most studies lack statistical power to detect an impact of an intervention on outcomes since the studies use the ICU and not the individual patients as the level of analysis.

Recommendations for designing future studies might be to use validated tools, to include a large number of



ICUs, to assess a single composite performance indicator, to compute multilevel analysis, and to define precisely the intervention aimed at improving culture/climate.

## Conclusion

Research carried out in different types of work units shows that unit climate is an important antecedent of unit performance [11]. This empirical evidence suggests that climate in ICUs can also have an important influence on ICU outcomes. Research aimed at testing this hypothesis in samples of ICUs is needed. Research carried out on the culture-performance relationship in ICUs shows that unit culture impacts on relevant performance indicators (for example, length of stay). Studies are still scarce, however, and more investigations are needed to ascertain the scope and importance of this influence. The role of the work unit leader in shaping unit climate and culture is critical. Therefore, training ICU leaders can be an effective strategy to build an adequate unit climate and culture in such a way that ICU performance is maximised. A global approach is necessary with probably more involvement of relatives [47].

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## Abbreviations

COMIC, Culture, Organisation and Management in Intensive Care; EURICUS, European ICU Studies.

## Competing interests

The authors declare that they have no competing interests.

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