

An explorative study of antecedents of organizational mindfulness in emergency room

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Abstract

Emergency Room (ER) can be considered as a High Reliability Organization expected to guarantee reliability despite facing hectic and unpredictable events. To achieve this status, ER should invest on the management style of Organizational Mindfulness, focused on anticipation and containment of errors. The aim of this exploratory research was to investigate how Organizational Mindfulness occurs in Italian ERs and what is the role of Safety Culture and Work Engagement in predicting Organizational Mindfulness measured with an *ad hoc* questionnaire. Results show how the communal sphere of Safety Culture seems a better predictor of Organizational Mindfulness than the individual sphere of Work Engagement.

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Introduction

As Vincente¹ states, the interest towards Emergency Room (ER), like health care, moves *from the patient to the politician*, due to the role it has for the safety of people as it can be identified as the port of entry of the entire hospital, so that failures in ER can dramatically affect the whole recovery of patients.² Reliability for ER despite difficulties is a first priority that justifies its inclusion within the set of organizations referred to as High Reliability Organizations (HROs). As Sutcliffe³ describes, HROs are organizations that operate in unforgiving social and political environments, because, having to constantly face risky and hectic situations, and dealing with perilous technologies, the consequences of their errors could be catastrophic both for them and the environment around. Furthermore, the inner structure of a HRO is characterized by tight coupling, that is, the strong interdependence of their components, each with their own procedures, and filled with complex communication networks.⁴

Examples of HROs are aircraft carrier and nuclear plants,³ and ER, considering the role within the entire organization of the hospital mentioned above, can be included too. Wears, Woloshynowych, Brown and Vincent⁵ detect six main difficulties to the accomplishment of ER's performance. First of all, the number of patients to recover is unpredictable, risking to fall into the overcrowding,⁶ and requiring often to interrupt the intervention moving from one patient to the other, so to increase the number of people to be visited later.⁵ Moreover, there is mostly lack of information about the case to deal with, and there is a slim chance to learn, not only because there is not feedback, as patients leave after recovering, but also because cases are seldom the same.⁵ The same authors⁵ cite the dependence on other structures as ambulances and laboratories as a further obstacle that, joint with the multidisciplinary required for intervention on cases,⁶ recalls the abovementioned tight coupling of HROs. Last, but not least, the presence of interns lacking an experiential knowledge can hinder the work of ER too.⁶

Trying to face similar difficulties, organizations could fall into the unconscious strategy to simplify their operations, so to find a harbor into their expectations on how reality works and what has to be done, just ignoring those details that seem strange because not fitting their beliefs.⁷ This leads to organizational errors, due to the proliferation of incremental shifts from safety and ideal performances that, when associated with any event, blow up in errors naively thought to be caused by the most recent event.⁸ Organizational errors can indeed be defined as systematically and socially organized within work activities⁹ and affecting the entire organizations. We could daresay that in an organizational error everyone participates, but nobody is responsible. In this way, reliability in HROs becomes a dynamic non-event,¹⁰ as it relies on reciprocal timely adjustment of workers and, as long as there's a good performance, nothing is thought to deserve attention, so that the overreliance on their own performance can hinder organiza-

tions from accomplishing their mission and makes them fall into errors. Bearing this in mind, HROs follow the paradigm of resilience that, in contrast with the prevention approach, accepts error as an understandable outcome of human behavior, and tries to find ways to cope with it, instead of completely erase it.¹¹

Weick and Sutcliffe⁷ indicate Organizational Mindfulness as a management style inspired by the ideal of coexistence of safety and risks to reach a reliable performance never taken for granted, but always to be proved through continuous efforts. Such ideal of performance can be guaranteed through the attention constantly paid to the discriminatory details that would be ignored upon the weight of expectations, but, in fact, indicating unexpected events that are going to happen. Organizational Mindfulness is so realized through two actions against unexpected events, that is, their Anticipation as an ongoing attitude and Containment through flexible strategies.⁷ Anticipation is based on three principles that compose Organizational Mindfulness. *Preoccupation with failure* is an ongoing awareness of unexpected accidents, even though barely dangerous, assuming that they could stem from breakdowns of the organization that could jeopardize its safety,⁷ *reluctance to simplify* indicates the ongoing attitude to question assumptions and procedures, and finally, *sensitivity to operations* means the ongoing interaction and information sharing in order to get the *big picture* of the situation. The two last principles of Organizational Mindfulness achieve the intention of containment. *Commitment to resilience* synthesizes the action to detect, contain and eradicate errors before they degenerate, while deference to expertise indicates the shift of decision-making and authority to those with more experience of the problem at stake, not matter what their status might be.⁷ Organizational Mindfulness, due to the principles it expires, can indeed be for ER the necessary tool to achieve the status of HRO. Despite some research can be found under the lens of HROs applied to health care,¹² fewer studies address expressively the entire construct of Organizational Mindfulness in health care,¹³ and even fewer studies focus on the role of Organizational Mindfulness in ER. But other constructs do play a significant and widely recognized role in reaching reliability in health care organizations and, consequently, in ER, such as Safety Culture and Work Engagement. While Organizational Culture is defined as the whole set of negotiations among members of a group forming the deep basics of the behaviors to be followed,¹⁴ Halligan and Zecevic¹⁵ in their review individualize Safety Culture as the interaction of such basics with practical operations devoted to commitment, style and proficiency that the organization invests in keeping high quality of safety in inner operations and delivering its services. They report how HROs paradigm is the most cited theoretical framework for Safety Culture, and the Institute of Medicine¹⁶ cites how safety culture has to be developed to prevent the negative effects of health care management on patients, so to turn into a genuine patient safety. It is self-evident that the resilience for ER realizes in safety of patients.

On the other hand, Work Engagement can be defined as a positive cognitive-affective and motivational state of people towards their work and consistent throughout time.¹⁷ It is characterized by three components: vigor, meaning high levels of energy and mental resilience at work; dedication, that is, involvement in work so to experience a sense of meaning and pride; and finally absorption, considered as becoming completely involved and concentrated in one's work.¹⁷ Work Engagement is defined by Kahn¹⁸ as the behavioral aspect of organizational presence of the worker, so to be linked to his/her work. Work engagement then brings people to be fully and happily involved in their work, able to find resources and strategy to face difficulties, so to achieve effectively the perform-

ance at work,¹⁹ and, since the performance of an organization is based on the interaction with other members, engagement can pass from an individual level to a team level,²⁰ a key advantage for organizations as HROs facing crises and unexpected accidents. Even though Work Engagement is harder to be found in literature as a variable related to high reliability than Safety Culture, Harmon, Sey, Hiner *et al.*²¹ clearly indicate investing on Work Engagement as a tool to enhance reliability in Health Care and nursing, within the framework of HROs.

In sum, ER can be defined as a HRO and the accomplishment and keeping of its reliability can be guaranteed through the enhancement of Organizational Mindfulness, a multidimensional construct that seems to be related to Safety Culture and Work Engagement, two aspects of reliability much more explored. Based on the nature of the two concept, we could hypothesize that both of them play a role in facilitating Organizational Mindfulness, the former as its collective facet, building the deep and cultural background that enhance the compliance of workers towards it, and the latter as its individual facet, indicating the contribution of each worker in striving for it.

Materials and Methods

Data have been collected through a convenience sample deriving mainly from the collaboration with the Academy of Emergency Medicine and Care (AcEMC), devoted to disseminate research about the topic of emergency medicine in Italy. 12 ERs took part to the research, most of them located in the North of Italy: Alessandria, Aosta, Malpighi of Bologna, Como, Matera, Sacco of Milan, Parma, Pinerolo, Rivoli, Savona, Udine, and Verona. Regarding Organizational Mindfulness, an *ad hoc* questionnaire was developed, through a total of three panels of experts (physicians and nurses) of three centers, and verified through a pre-test in a fourth panel with physicians, nurses, white collars and Operatori Socio Sanitari (O.S.S.) an Italian category of health professionals. So, the final batch of questionnaires included (Table 1): i) the *ad hoc* questionnaire for Organizational Mindfulness: 30 items, 5-point Likert scale (from 1 = *strongly disagree* to 5 = *strongly agree*); ii) Accertamento Opinioni Sicurezza:²² 25 items, 5-point Likert scale (from 0 = *strongly disagree* to 5 = *strongly agree*). The questionnaire assesses Safety Culture through the four dimensions of *Team, Information and Communication, Proposals and Development* and *Guarantees for Safety*; iii) the Italian version of Utrecht Work Engagement Scale:²³ 17 items. 7-point Likert-scale (from 0 = *never* to 6 = *always*). The questionnaire assesses Work Engagement through the three dimensions of *Vigor, Dedication* and *Absorption*; iv) A survey sheet.

An Exploratory Factorial Analysis (EFA) was used to determine the dimensions of Organizational Mindfulness. A hierarchical regression using the predictors of Safety Culture and Work Engagement was performed to assess if the shift of the order they were put into the model could change their effect, so that Safety Culture was put before Work Engagement in the first model, and vice versa in the last one. Finally, stepwise regressions were conducted, including the single dimensions of Safety Culture and those of Work Engagement, and then testing all of them together, wanting to investigate what dimensions best predict Organizational Mindfulness. Manova among ERs and among professional roles, besides correlations among variables, were conducted with an explorative purpose. Statistical analyses were performed with the package IBM SPSS Statistics 20, and an alpha of

.05 was elected for all the analyses.

Univariate normal distribution of items was assessed with Kolmogorov-Smirnov and Shapiro-Wilk and they both resulted significant, even though kurtosis' and skewness' levels were only in a few case out of the expected limits. The ratio with their standard error was beyond the acceptable limits in some cases. Therefore, the normal distribution of all items was not accepted. As a matter of fact, Mahalanobis Distance detected a shift from normal multivariate distribution that was considered not fully respected. But, since not significant outliers were noticed when examining standard scores or furthest neighbor clustering, and due to the exploratory purpose of the research, all items and all subjects were included for the analyses.

For EFA, many correlations among items of the questionnaire for Organizational Mindfulness exceeded the threshold of .30 and the determinant of correlation matrix was different from 0, thus allowing to conduct a factorial analysis. Kaiser-Meyer-Olkin for sampling was .934 and Bartlett's test for sphericity was significant ($\chi^2= 4685,973$, $P < 0.05$ df 325). Due to the doubts about the normal multivariate distribution, a principal axis factoring was adopted, following the criterion of eigenvalue higher than 1 to choose the number of factors.

Results

421 out of 425 questionnaires were considered valid as a minimum cutoff of 1 month of staying in the ER was adopted. The sample comprised 191 (45,4%) nurses, 120 (28,5%) physicians, 80 (19%) O.S.S. and 23 (5,6%) others, 7 (1,7%) participants did not provide this information. 246 (58,4%) participants were females and 162 (38,5%) males. The average total of years of work in healthcare was 15 years and average years in each ER were the survey was conducted 8 years (Figure 1).

Five dimensions were selected, indicating a good level of internal coherence as assessed by Cronbach's alpha and that were interpreted as *Reluctance to Simplify* (9 items, alpha = .888), *Information seeking and sensemaking of unexpected* (5 items, alpha = .829), *Deference to personal competence* (5 items, alpha =

.778), *Commitment to resilience* (4 items, alpha = .751) and finally *Importance of collective competence* (3 items, alpha = .717).

ERs result different across all the dimensions tested, while the professional roles differ across Work Engagement ($P < 0.00$), and its individual dimensions (Figure 2). Besides, professional roles differ for Organizational Mindfulness' *Reluctance to Simplify* ($P < 0.01$) and *Deference to personal competence* ($P < 0.01$), and for Safety Culture's *Team* ($P < 0.03$).

Organizational Mindfulness has a positive correlation with Safety Culture ($r = .83$) and the correlations with its dimensions are high too. The correlation of Organizational Mindfulness with Work Engagement is equally positive ($r = .46$) and the correlations with its individual dimensions are around .40. Safety Culture and Work Engagement have a positive correlation ($r = .41$), but the correlations of their dimensions are on the hedge of .40 or lower.

For the hierarchical regression, the absence of collinearity between Work Engagement and Safety Culture was confirmed (Tolerance = .83; VIF = .120), even though the variance explained by collinearity was considerable for Work Engagement (.88). Absence of autocorrelation was confirmed (Durbin-Watson = 1.82) and so the assumption of residuals through the analysis of mean and distribution. The block where Safety Culture precedes explains up to 70% of variance of Organizational Mindfulness, 68% of which is comprised by Safety Culture, and 2% by Work Engagement. Safety Culture's beta decreases from .83 of the first step to .76 when Work Engagement is introduced, which beta is .15. In the second block, where Work Engagement is put first, it explains 21% of variance of Organizational Mindfulness in the first step, with beta equal to .46, while Safety Culture's percentage is 49%.

For the stepwise regression with the dimensions of Safety Culture, the collinearity of the variables was high but acceptable. The absence of autocorrelation was confirmed (Durbin-Watson = 1.84) and the assumption of residuals were verified. Results show how the 4 dimensions of Safety Culture can explain 70% of Organizational Mindfulness, 60% of which is explained by Team, which beta equals to .77 in the first step, decreasing down to .29 in the last one, followed by Guarantees for Safety, which beta decreases from .38 to .28.

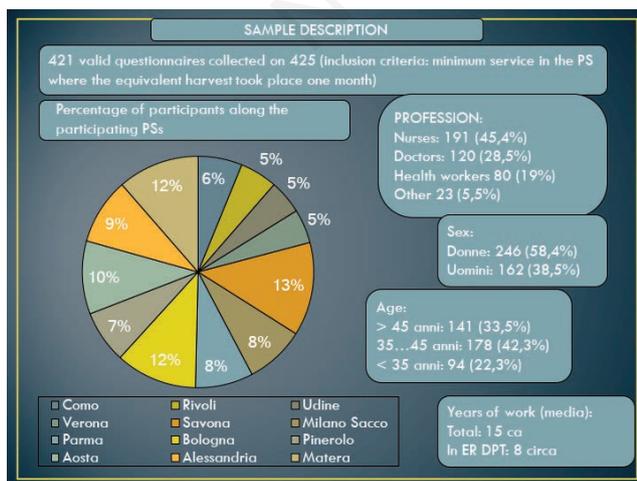


Figure 1. Research sample composition.



Figure 2. Relative position of the participating First Aid along the 5 factors.

For the stepwise regression with Work Engagement's dimensions, the model removed Dedication. The doubts about the eligibility of the accepted variables are higher but acceptable. The absence of collinearity was confirmed (Tolerance = .353; VIF = 2.836), even though the variance explained high, and autocorrelation is on the limit too (Durbin-Watson = 2.035), whereas the residual assumptions are respected. The final model explains 21% of variance, but 19% is occupied by Vigor. Vigor's beta is .441 in the first step and .261 in the final one, near to Absorption's (.223).

Assumptions analysis for stepwise regression with all the dimensions of the two constructs report higher values of VIF and lower of Tolerance, autocorrelation is not present (Durbin-Watson = 1.84) and assumption of residuals respected. The final model explains 71% of the variance of Organizational Mindfulness, and it comprises Team (60% of variance explained; $\beta = .28$), Guarantees of Safety ($\beta = .24$), Proposal and Developments ($\beta = .23$), Absorption ($\beta = .15$) and Information and Communication ($\beta = .12$).

Discussion

EFA confirmed five latent dimensions that can be considered valid to represent Organizational Mindfulness.⁷ *Reluctance to simplify* is confirmed from the original model, and represents the aspect of Anticipation, enhancing an attitude to question assumptions so not to fall into organizational errors. On the other side, *Deference to personal competence* and *Commitment to resilience* actualize the Containment of errors accepting new decision makers and strategies. The other new dimensions equally fit the model of Organizational Mindfulness.⁷ *Information seeking and sensemaking of unexpected* synthetize the Sensemaking, another important Weick's contribution, considered as the effort to actively question what happened to build a constructive meaning of experience,²⁴ so to operate together with *Importance of collective competence* in representing Organizational Mindfulness as a collective learning during time.⁷

Differences among professional roles exist mainly in the

dimensions of Work Engagement. This could rely on the division of workers in professional categories where their organizational presence takes place,¹⁷ whereas Safety Culture occurs as an embedded and widespread attitude beyond such division. This could explain why the only difference occurred is in Team, even though on the edge ($P < 0.03$). The only difference for Safety Culture found with ANOVA was for white collars and nurses, even more on the edge ($\alpha = .041$), and it should be considered that white collars have often a marginal role in emergencies.

Analyzing the correlations, even though both Safety Culture and Work Engagement have a positive correlation with Organizational Mindfulness, Safety Culture has a correlation almost twice than Work Engagement, indicating a deeper relation. Even though Safety Culture and Work Engagement correlate too, their single dimensions have weak correlations, what could mean that, even though they share a common framework (*e.g.* reliability) they work on different levels: communal for Safety Culture and individual for Work Engagement.

Hierarchical regression confirms that Safety Culture has a predominant role as predictor of Organizational Mindfulness compared to Work Engagement. The two joint variables can explain a valuable amount of Organizational Mindfulness, even though Safety Culture covers the almost totality of it. Even though the contribution of Work Engagement increases when it is introduced as first predictor, the contribution of Safety Culture is still considerably higher.

Stepwise regression for Work Engagement unexpectedly erased Dedication from the final model, while Vigor covers almost all the contribution of the model. This could mean that Organizational Mindfulness is achieved through the effective resilient behavior of people, much more than through the meaning they give to their work.

Stepwise regression with the dimensions of Safety Culture and Work Engagement showed how Organizational Mindfulness is predicted by the set of Team, *Guarantees for Safety*, *Proposal and Developments* and *Information and Communication*, besides the component Absorption of Work Engagement, excluding Vigor. This result, jointly with those of hierarchical regression could con-

Table 1. First part of the questionnaire used for the survey (18/36 items).

1. In our emergency room there is awareness of having to face the unexpected.
2. In this first aid everyone feels responsible for the reliability of the service.
3. In our emergency room there is broad agreement on how the situations we face could go wrong
4. In this emergency room it is difficult to get all the information you need to do our job better
5. Pressures prompt our first-aid workers to take the shorter alternative, even if not compliant with the protocol, to dispose of the work faster.
6. Unforeseen opportunities rarely occur in our emergency room.
7. We actively research all possible critical issues (large and small) and try to understand them.
8. When something unexpected happens in our emergency room, we always try to imagine why.
9. In our emergency room we consider adverse events, even without negative consequences, as useful information from which to learn
10. Whoever has a role of responsibility in this first aid is actively seeking to be informed about organizational issues.
11. If you make a mistake, you will not be weighed.
12. In our first-aid staff members are recognized when they identify a potential source of problems.
13. In our first aid, anyone is encouraged to ask questions about how best to do their job.
14. The personnel of this emergency room are encouraged to express different points of view with respect to reality.
15. There is careful listening, and the opinion of every first-aid member is heard.
16. When someone reports a problem, even if he interrupts activities in progress, he is not criticized.
17. First aid personnel feel free to raise problems and difficult issues.
18. Generally members reflect to deepen the nature of the problems that arose in the emergency room.

firm how Safety Culture, mainly in its aspect of *teamness*,²⁵ is a valuable predictor of Organizational Mindfulness.

Conclusions

ER can be considered a HRO, that is, an organization keeping good standards of reliability despite facing hectic and unpredictable events. Henceforth, it is advisable for ER to develop Organizational Mindfulness, a management focused on anticipating and containing errors questioning assumptions and procedures. The aim of this survey was to explore the presence of Organizational Mindfulness in Italian ER and the role played by Safety Culture and Work Engagement, two constructs found in literature to be related to safety and performance. Results confirm that Safety Culture has a deeper effect on Organizational Mindfulness compared to Work Engagement, whose dimension of Vigor however deserves attention. This could mean that Organizational Mindfulness is truly a *Collective Mindfulness*,⁷ meant as a characteristic of the organization in a all and not just the sum of its workers. Some limits can be addressed to the research, first of all the absence of a probabilistic sample and balanced groups, which could have affected the distribution of variables and results, namely in the difference among groups. Future research should invest more to overcome such limits. Nevertheless, this survey focus on an important issue for Organizational Mindfulness and HROs, that is, the role of individuals and collectivity, indicating how resilience of ER has to be promoted focusing on the whole organization, building a Safety Culture shared by workers, much more than investing on the commitment of the single person at work.

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