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1. INTRODUCTION

Being safe and feeling safe are basic human needs, and due to these needs causality of an accident has changed through the years, from God's punishment, up to investigating the technical failures, during industrial revolution, and the human factor in '70s. The ethical and moral drives impose organizations' management and employees, to provide an ensured safe environment. An injury is a traumatic experience in a person' life and it should be avoided anyhow. The injured person's social surrounding is also psychologically traumatized by the injury and its consequences. Additionally, every occupational injury has a direct impact on productivity and cost. In order to assure of safety, society established regulations for compliance, for non-conformity and injuries, for insurance and compensation, for the injured person, the assets and the production. During accidents' investigations, in '80s, due to the expansion of management, the safety engineers realized that an accident could be caused by organizational failures (Aviation Safety Guru, 2023). Recently, due to the complexity of the problem and the continuous occurrence of accidents, the new approach on safety is to see it as a complex system (Dekker S. , 2018).

In the last sixty years safety science enlists several disciplines, such as engineering, statistics, management, psychology, sociology, anthropology, in order to confront and mitigate the tangible and intangible loses. The safety science includes Safety Culture, Human Error, High Reliability Organizations, Process Safety Management, Incident Causation Theory, Resilience Engineering, Safety Mindfulness, and Mental Health (FAA, 2009). Analyzing the complexity of the system, occupational safety should be holistically approached through a) the technical approach, establishing and re-evaluating the safety management systems, b) the economic approach, estimating the losses and the credits for each proposed initiatives, c) the cultural theory approach, measuring the risk perception of the employees, and d) the psychological approach, measuring the employees' feelings (Dekker S. , 2018). These four parameters of safety measures should be investigated and monitored in parallel, in order to be effective and efficient in safety outputs.

Preventing occupational fatalities and injuries is one of the main tasks that society still struggles to achieve. In the last 35 years there is a significant change in safety science, and its efficacy in the UK construction industry is up to 66% decreasing the injuries that required more than 7 days recovery, but for fatalities and serious injuries that require more than 30 days for recovery, the number remains almost the same, with an annual average of 24000 cases (Cooper M. D., 2019). The human error is the major cause of accidents. *Why can the human error be prevented on a high extent in some industries and not in others?*

The investigation of human error has changed through the years. The old view sees it as it is the cause of trouble and it is the conclusion of an investigation, which answers the questions of *what* failed and *what* should had been done. The new view sees the human error as the symptom of the organization and it is the starting point of

an investigation, which tries to understand *why* people did what they did (Dekker S. , 2006). According to cognitive behavioral theory, people act according to their values, goals, knowledge and focus of attention. Trying to understand the correlation between the values and the behaviors could lead us to solutions of improving safety culture and safety outcomes.

Safety culture relates directly to the fatalities and injuries for most of the investigated industries. In healthcare, the last 20 years, it is investigated the safety culture in the hospitals, in order to improve patients' safety. In an Emergency Department (ED), the failure to rescue is defined as patient mortality, but the mortality rate of the emergency department is not equal to the rate of rescuing failures, which cannot be estimated, due to under-reporting, situational perception and awareness. Mitigating the rescue failures, an escalation of health care is mandatory, where the human factors, such as teamwork, leadership, tasks, equipment, workspace, culture, and organizational management, have a critical role (Ede, 2019). All the above-mentioned factors are measurable factors of safety culture theory.

Referring to the evolution of safety management, Safety-I is protective management, which focuses on *how things can go wrong*, and then Safety-II changed it to productive safety, focusing on *how things go well*. Safety-II is applied in complex sociotechnical systems, where a standard procedure for every operation cannot be applied, and the existing procedures are not sufficient for effective safety performance (Hollnagel, 2017). Health care is an extremely complex system due to its many complex interactions and the vast variety of demand (Hollnagel E. , 2015).

Undoubtedly, health care staff is human-centric, and the national health care system should be human-centric as well. Recently, EC Europe is heading to Industry 5.0 on a human-centric approach: "It complements the existing "Industry 4.0" approach by specifically putting research and innovation at the service of the transition to a **sustainable, human-centric** and **resilient European industry."** (Commission, 2023)**.** So, focusing on *how things go well* in an emergency department in terms of patients' safety, could help to emulate these practices in other complex systems like construction, etc.

This study analyzes the safety climate in Hellenic Emergency Departments (HED) of eleven hospitals, using qualitative data of interviews and author's observations, and quantitative data of a survey. Furthermore, it investigates which socio-organizational factors have positive affect on patients' safety. These findings are compared with studies on other industries in order to extract conclusions and practices that could be applied widely in health and safety management.

1.1. Objectives Questions

What is the current situation in the safety climate and awareness in Hellenic Emergency Departments?

Which type of leadership is applied in HEDs and which are its characteristics?

Could the quality of service and patients' safety be improved in the Hellenic emergency departments?

Which good practices from the emergency departments could be projected on other industries?

1.2. Project Aim

The project aim is to improve the patients' safety and the service quality in HEDs and project the good practices on other industries.

1.3. Project Objectives

The objectives of this study are to:

a) Evaluate the safety climate and awareness in Hellenic Emergency Departments.

b) Identify the leadership style in HEDs and evaluate the important characteristics in leaders' personality and their behavioral attachment.

c) Propose improvements for patients' safety and quality of service in HEDs.

d) Propose possible applications of the HEDs findings on other industries.

1.4. Strengths and limitations of this study

This study has used methodological triangulation of qualitative method, using data from interviews and observations (as a patient), in comparison with the quantitative method, using data from the survey and hospital's data collection. The survey has used safety culture theory, measuring the risk perception, teamworking, practices of safety management systems and psychometric approach, measuring the employees' feelings. Additionally, the survey had occurred in different geographical areas and the participants are three different groups a) specialized physicians, b) trainees-physicians in a specialism, c) nurses. Each group is categorized according to working experience. These three types of triangulations enhance the credibility and validity of the results.

The limitations of the study are the small sample size of participants in each group (especially for the nurses). Due to the time limitations, I had approached only 13 hospitals and 11 of them have joined the research. Two hospitals were excluded from the study because of their intense bureaucratic processes, which take a lot of time.

Another limitation of the study is that eventually I have not requested from the hospital to provide me with official data for the mortality rate in ED, in order to relate them with the safety culture. This was a deliberate decision, in order to avoid creation of fear and blame culture in HEDs. I trust the directors' input because I had asked them to inform me about the right procedure of claiming such information.

Another limitation of the study is on projecting the results on other studies on other industries, due to time limitations.

2. THEORY

2.1. Patients Safety

Various organizational, humans and system factors can affect and impact the effectiveness (rescuing, or not) and efficiency (how fast is the response) of the implementation of patient safety systems. Safety climate is one factor, measuring the medical and nursing staff's perceptions, behaviors, beliefs and attitudes about patients' safety. The safety climate relates with the impact and frequency of the errors.

The first research in patients' safety had started in Australia in 1999 and it was about the development, measurement and improvement of safety culture in healthcare (Kohn, 1999). Since then many studies have tried to mitigate human error, through organizational factors Safety Management Systems, communication, etc, but also about personnel's attitude. The safety climate survey in attitudinal domain should include the following:

1. Teamwork Climate – measuring the perception of the quality of collaboration within the teams.
2. Safety Climate – measuring the perception of the organization's commitment to safety.
3. Stress Recognition – measuring the ability of recognition of the stress impact on personal performance.
4. Job satisfaction – measuring satisfaction and dissatisfaction of the conditions in everyday work.
5. Perception of Management – measuring the management's actions.
6. Work Conditions – measuring the quality and the conditions of the working environment (Connell, 2021).

Connell study has shown that patients' safety relates to EDs staff's expertise and experience, which are related to management and education.

2.2 Safety Culture

Documents for review were sourced from academic and applied literature, and explored the following key topics:

- Definitions of safety culture and safety climate,
- Safety culture indicators,
- Existing assessment tools and techniques,
- Health and safety management methods.

The definition of culture according to Merriam-Webster dictionary is:
a) "the customary beliefs, social forms, and material traits of a racial, religious, or social group" and "the characteristic features of everyday existence (such as diversions or a

way of life) shared by people in a place or time".
b) "the set of shared attitudes, values, goals, and practices that characterizes an institution or organization".

The definition of safety according to Merriam-Webster dictionary is: "the condition of being safe from undergoing or causing hurt, injury, or loss".
Therefore, the safety culture definition is the set of shared attitudes, behaviors, practices and goals regarding safety value, by the people who work in an organization at a specific time. The Coopers' business process model of safety culture is demonstrated below in Fig. 1.

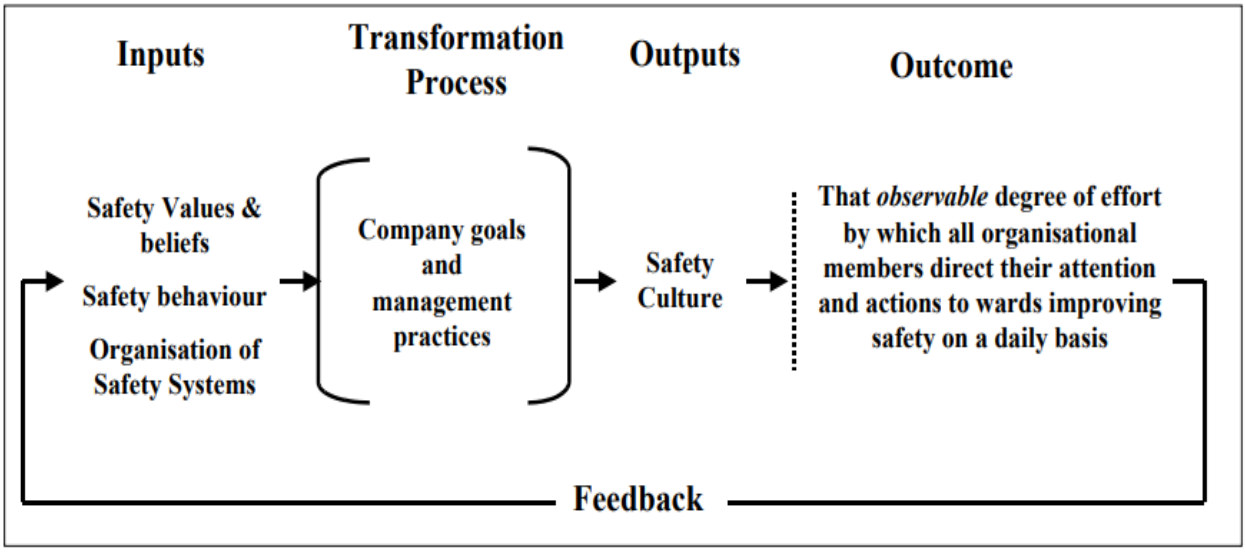

Figure 1. Business Process Model of Safety Culture (Cooper 2002)

Safety culture is a product – output of the transformation process of the company's management practices and goals, in a closed loop, according to its values, beliefs, behaviors and safety systems (Cooper D. , 2002). Therefore, this means that the organizational safety culture is the perception of safety and hazards of the managers and the employees and their actions and behavior accordingly.

The difference between safety climate and safety culture in an organization is that the safety climate is a temporal state measure of the safety culture captured at a specific time, regarding safety attitudes and behaviors (Wiegmann, 2002) and safety culture is the attitudes and behaviors of the employees during a longer period of time, without any additional organizational intervention.

According to Guldenmund's review, the safety culture in an organization is constructed in three layers: a) the core consists values and norms we have since our childhood which are invisible basic assumptions, b) the cover layer is the adopted values and conscious attitudes, and c) the outer layer is the visible artefacts (Guldenmund, 2000).

According to Schwartz the values are beliefs, and they are linked with feelings, desirable goals and motivation. They avail as standards and criteria, which means they can be prioritized, and transcend any action in decision making Fig.2. (Schwartz, 2012). Schwartz defined ten motivational values that relates to self-transcendence, conservation, self-enhancement and openness to change. There is a dynamic relation among the values as well as value conflict, as the openness to change contradicts to conservation and the self-enhancement contradicts to the self-transcendence. that some values conflict with other, like the benevolence and power.

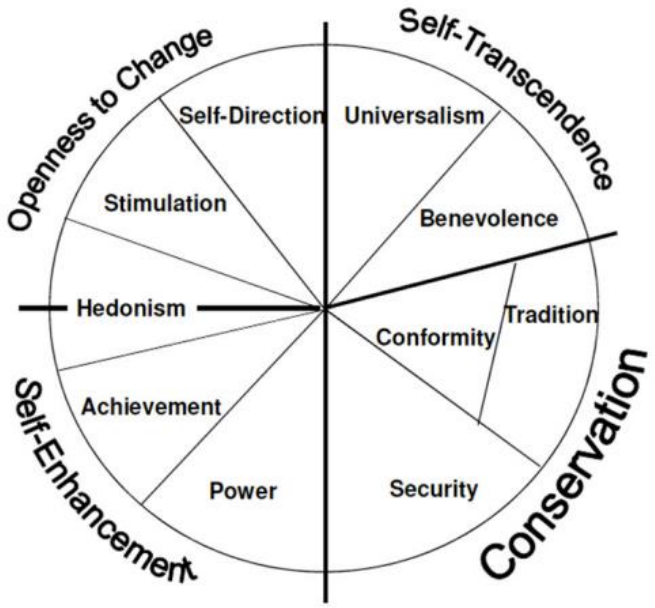

Figure 2. (Schwartz, 2012) Dynamic relations among 10 basic human values.

The same values are demonstrated in Fig3. in relation to the interest (personal or social) and the anxiety.

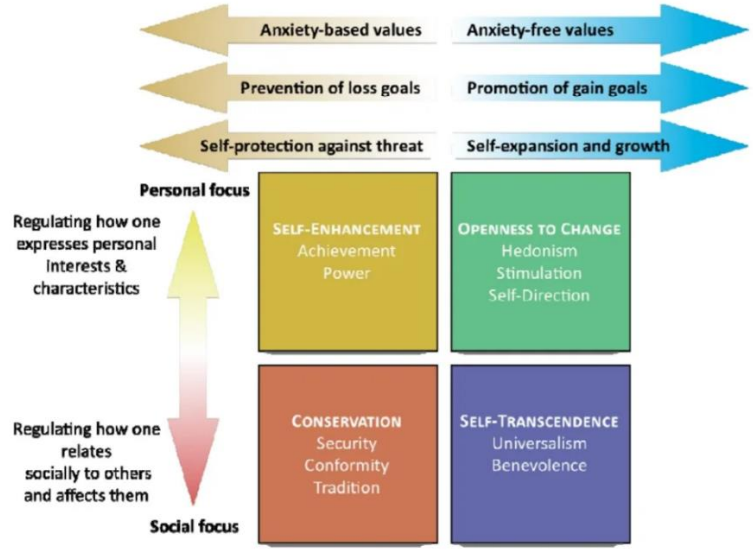

Figure 3. (Schwartz, 2012) 10 basic values in relation to interest and anxiety.

Norms, according to Reber, is “any pattern of behavior, or performance that is typical or representative of a group or a society” (Reber, 1985). For example, living in a tent is a typical pattern of behavior of some nomads and that defines them culturally. There are three types of norms: a) subjective norms which relates to the psychological pressure we receive for our behavior from the people we care for their opinion, b) descriptive norms which relates to how we perceive others’ behavior, c) behavioral norms which relates to groups’ behaviors. According to Manning, the descriptive norms have a greater influence on behavior than the subjective norms (Manning, 2009).

According to Neal et al, the organizational climate that describes the employees’ and the leadership’s perception of the value of safety, could define the current safety climate of the organization (Neal, 2000). So, as perception could be transformed, then, safety culture could change with time, with organizational interventions. According to (Cooper D. , Towards a Model of Safety Culture., 2000) the safety culture should be approached by the psychological, the situational and the behavioral aspects. The psychological aspects are “how the employees feel and think”, according to their values, which creates attitudes, norms and perceptions. The behavioral aspects are how the employees are behaving, “what people do”, which are their daily actions related to safety and they are influenced by the psychological and situational aspects. The situational aspects are the policies, procedures, regulations, organizational structure, and the safety management systems that the organization has.

The safety culture is the output of a transformational process within an organization that according to its goals and management transforms the hearts, the minds and the daily actions of its employees (Cooper D. , 2002).

Later on, their factors and characteristics of these three aspects have been defined as it is demonstrated in Fig.4., as a closed process where the psychological aspect is the input, which affects the situational safety culture, which affects the behavioral safety culture and give the measurable outcome in NearMISS (Cooper M. R., 2016). The behavioral aspects are how the employees are behaving according to the situational safety culture characteristics, the safety issues and it relates to attitudes which could change if the mentioned inputs have changed.

The situational aspect analyzes the safety culture according to six characteristics: the supervision, the safety management systems, the risk identification, the work pressure, the competence and the procedures/rules.

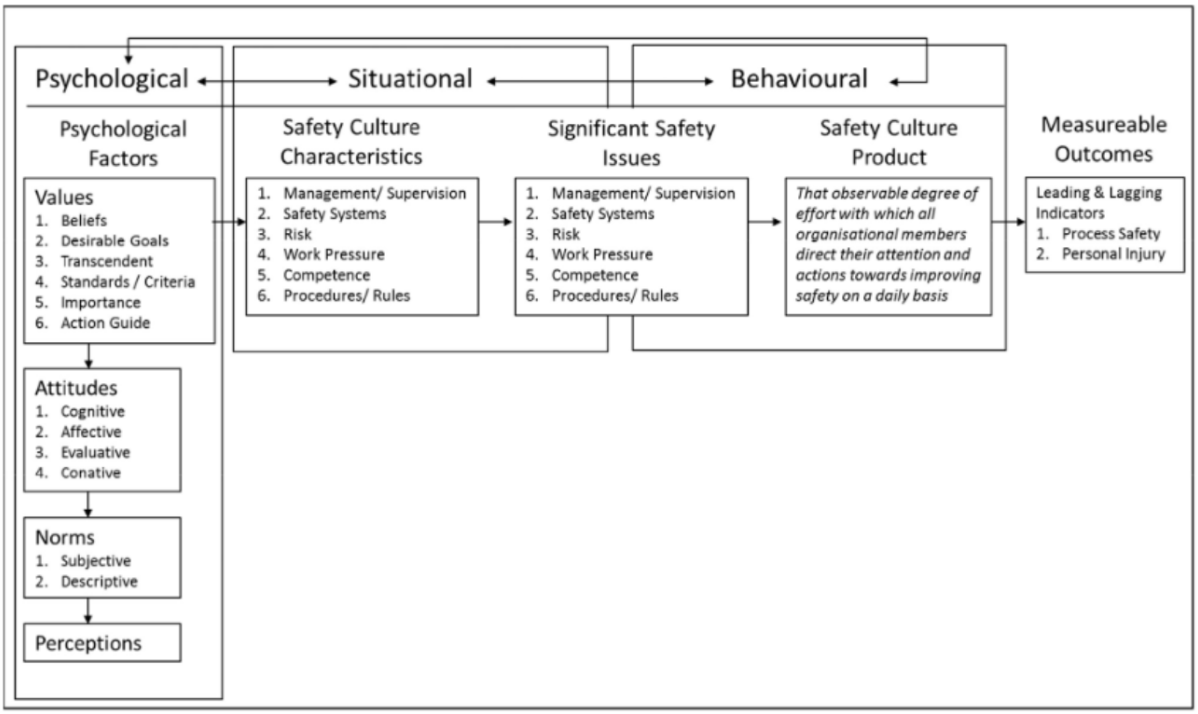

Figure 4. (Cooper D. ,2016) Navigating the safety culture construct: a review of the evidence revised reciprocal model of safety culture.

Safety management could transform employees' safety behavior (Cooper D. , 2002). Employees' trust or distrust in organization's goals and management influences their safety behavior (Conchie, 2011). The top management strategies could have a direct effect on the organization's performance as well as on the occupational safety (Way, 2002). Managers should ask two main questions: a) who the organization has been proactive towards safety and b) how effective are the actions have been taken for improving safety culture. Measuring and monitoring safety climate is the input for establishing the top management safety strategies. The measurement of safety climate of an organization is about the employees' perception about safety, in relation to the coworkers and the management. The magnitude of change for the employees' perception about safety does not match to the actual changes in employees' safety behavior (Cooper M. D., 2004). The total magnitude, when it is above the average of the scale can be characterized as positive safety climate (very good, good), and when it is below the average is characterized as negative (bad / weak / poor, very weak / poor). Having a good safety climate in a company means that the company provides a safe working environment to the employees, which satisfies one of their core's human values. The strong management commitment on safety is reflected on the safety climate as well as to the actions for improving it, like training and rewards (Vredenburgh, 2002). According to Glendon et al, improving safety climate is part of a top-level strategy that involves Human Resources Management for managing human risk and includes selective hiring, clear communication and information sharing, workforce involvement, rewards, training and well-established safety management system (Glendon I. C., 2006).

The high rate of injuries which includes some under-reported incidents, relates directly to poor safety climate (Probst, 2010). There are many factors that can affect safety climate, such as values, attitudes, behaviors, human, psychological, social, organizational, economic and environmental factors. The main factors for a good safety climate are the top management commitment having safety on a high priority, the training and the well-established safety systems (Neal, 2000).

2.2.1. Values and safety climate

There are few studies that examined the relation between values, safety climate and safety performance. Colley examined the perception of organizational values of employees in high-risk industries (mostly in mining, power/electrical, engineering/construction, and other miscellaneous industries) in relation to the safety climate and the safety incidents. The method was based on adapting the competing organizational values from (Jones, 2005) and (Parker, 2000) and creating a framework as it is shown in Fig.5.

The results of 368 participants of the survey, were classified into the four profiles: Human Relation, Open System, Internal Process and Rational Goal. The 83% was classified in one profile and the rest in two profiles. According to the results, the majority of the participants perceived that the company they are working has the Internal Process profile, then follow the Human Relations, the Rational Goal and last one the Open System. This could be expected because in this type of industries the daily life of the workers is based on following the procedures and not in innovation and doing things differently.

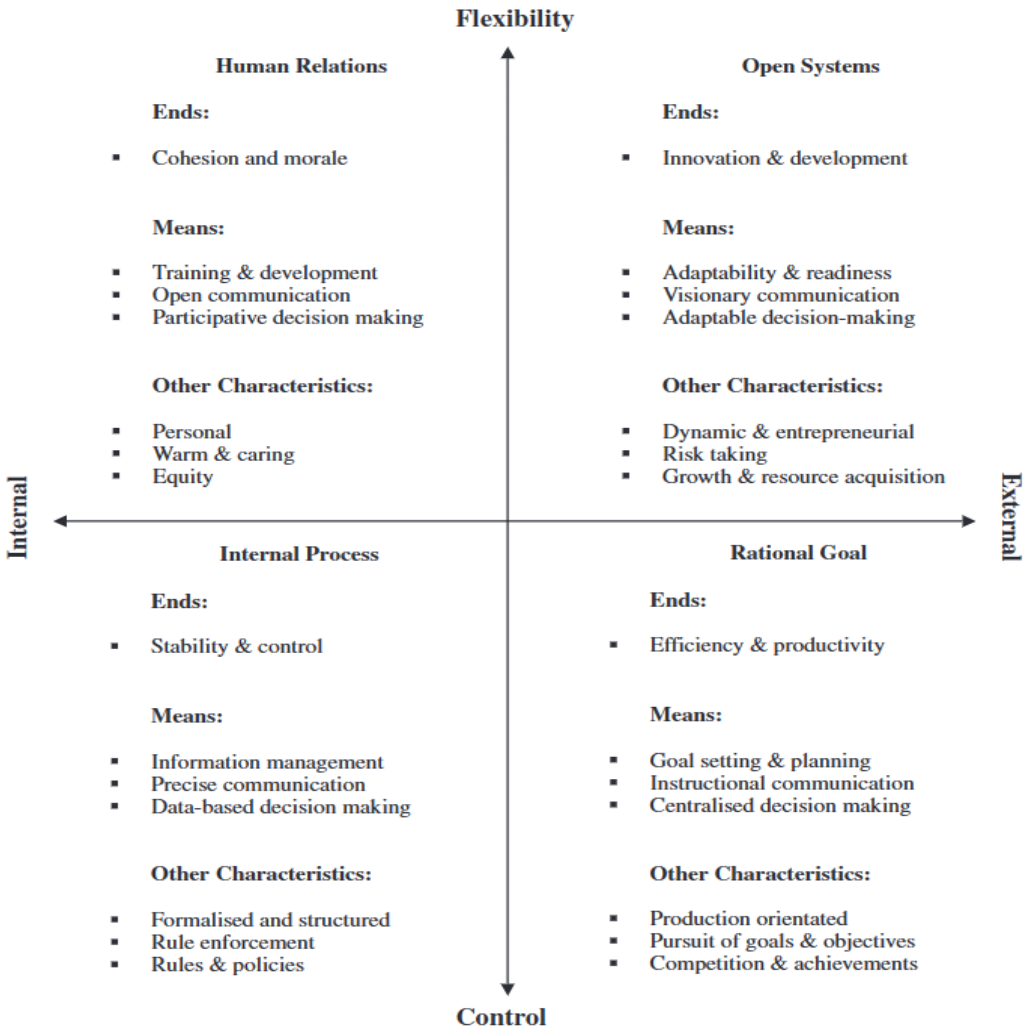

Figure 5. (Colley, 2013) The Competing Values Framework.

Employees that perceived their company as human-centric reported better safety climate and performance than the others. In particular, those that believed that their company strongly accentuates the employees' well-being, or the employees' well-being and the goal achievement reported higher scores on safety climate and performance, than the ones that believed that their organization strongly accentuates on the formal procedures or on formal procedures and on goal achievement, who reported low scores in safety climate and performance (Colley, 2013). The worse performance across the six measurements in safety climate had the conjunction of the Internal Process and Rational Goal profile. Additionally, this profile was the second negative profile for unreported incidences, with first negative profile the Internal Process, which means that the formal – distant relationship between the employees blocks the free communication and trust, and if there is a competitive environment in order to achieve the rational goals, it might create fear for the reporting, due to possible penalties. The paradox with the Rational Goal profile is that when it combined with Human Relation has a positive affect to safety outcomes and when it is combined with the Internal Process has the worst affect, so the human relations definitely affect positively the safety climate and outcomes. This complies to (Schwartz, 2012)

assertion about the conflicting values, as the well-being of employees could also co-exist with goal attainment.

According to Colley's Human Relation profile of a company, has a warm, caring and evenhanded working environment, and practices training and development, open communication and participation in decision making. Employees who feel that their company cares about them, reported high scores in measuring the safety climate according to organizational, supervisory and co-worker aspects, as well as they had low rate of safety incidents. This means that the employees' perception of organizational values could influence their perception about policies and procedures.

Another reason that the human relations models perform better in safety than the internal process, is because they emphasize in flexibility instead of control. It is common sense, in order to control safety behavior, we create process and procedures, but here is the paradox of control, as the company emphasizes in processes, it adversely affects morale and mitigate the inspiration for learning and development to the employees, who they become passive, and they feel that their safety is someone else responsibility. On the other hand, strong human relations within the company, will reenforce the perception of values and the safety climate and outcomes within groups, as the colleagues could influence each other and make micro-adjustments accordingly, like a sport team with strong bonding that can communicate without even speaking, and make micro-adjustments during the game achieving scores.

Changing the mindset and the values of an organization is quite difficult according to Zammuto, as the new interventions will fail to be adopted, if they are not complaint to the dominant values within the organization (Zammuto, 2000). In particular, the traditional control systems by the procedures were designed by the engineers and managers, and they are occasionally re-evaluated on the mindset of controlling and narrowing the bandwidth of human action, in order to have better safety outcomes. This type of organizations might face difficulties to foster innovation and adaptability, due to the long period of having that traditional mindset and doing things on a certain way. As they will continue narrowing down the bandwidth of human action and increasing the check lists, the operations will last longer, and the employees could not finish on time. This will raise a conflict with the managers who should changes the goals and if it will not be solved, it will create a dilemma to the workers, either to do their job according to the new safety procedures and be late, or to choose a shorter way and skip some of the safety requirements. This explains why the profile of Internal Process in conjunction with the Rational Goal has the worst safety outcomes. Even someone will take the rational decision to late / slow and safe, rather to take a short cut, risking safety, he/she will face the criticism of the managers and colleagues in a competitive working environment, without strong human relationships. This pressure could influence him/her to make short-cut when nobody is watching him/her, and it can cause an accident.

2.3. Human Factor Theory

According to the Human Factor Theory (DeCamp, W. , Herskovitz, K., 2015), *an accident could be caused by*

1) Overload due to:
   - Environmental factors (noise, vibration, distraction)
   - Internal actors (personal problems, emotional stress)
   - Situational factors (unclear tasks, instructions, risk level)

2) Inappropriate response
   - Detecting a hazard but not correcting it.
   - Removing safeguards from machines and equipment.
   - Ignoring safety roles.

3) Inappropriate activities
   - Lack of training
   - Lack of risk perception

The types of Human Error according to (Glendon I. , 2006) are slips, lapses, mistakes, and violations, schematically demonstrated in Fig 6. Slips and lapses are skill-based errors, the mistakes are knowledge-based errors, and the violations are intended actions.

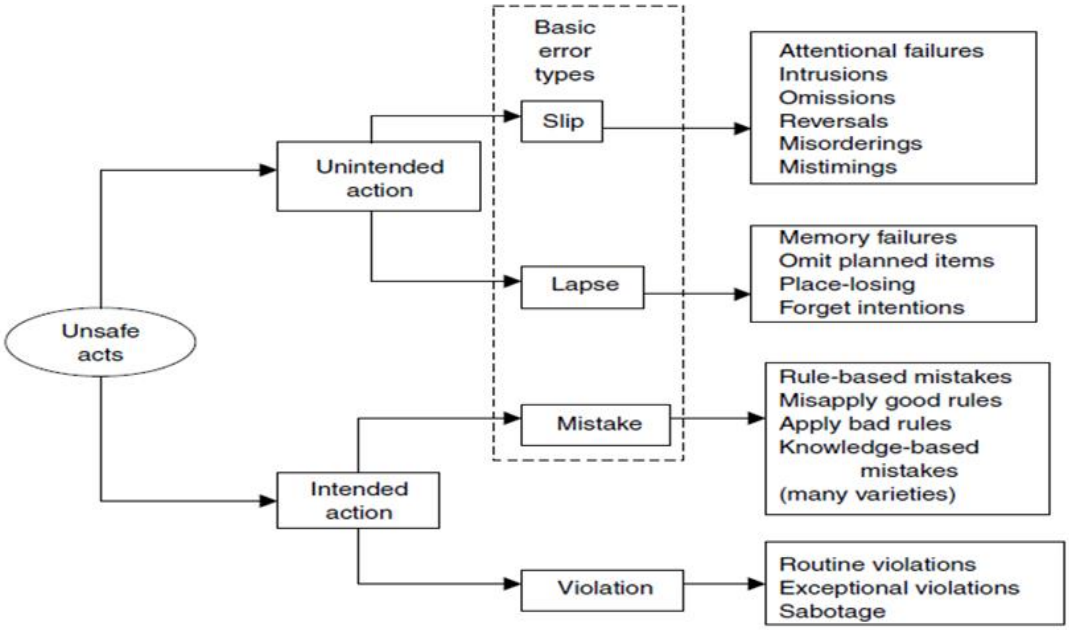

Figure 6. Types of Human Error (Glendon I. , 2006)

Based on Reasons definitions, the human error relates to the lack of knowledge, rule-based or skill-based errors. The highest probability of an accident is due to lack of knowledge, as it is demonstrated in Fig.7. (Glendon I. , 2006). To understand the value of training and the knowledge it could offer to an employee, we must consider the consequences of asking a nurse to do a surgical operation and the

probability of succeeding. This leads to the conclusion that only by ensuring the appropriated employees' education and training, could be achieved the best performance in an organization.

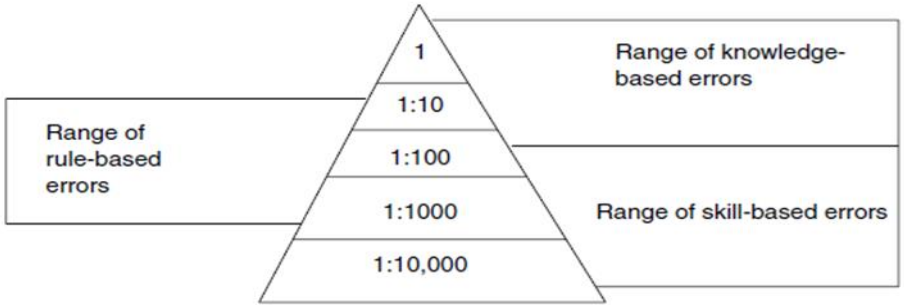

Figure 7. Probability ratios for different error types. (Glendon I. , 2006)

Human factors affect the decision making and the performance of action is the long-term memory and the stress (Endsley M., 1995). The Stress is defined as physical stress (noise, vibration, environmental conditions, drugs, boredom, and fatigue) and social psychological stress (fear, anxiety, uncertainty, self-esteem, prestige, job loss, financial problems, mental load, and time pressure). Emotional instability, overconfidence, or fed up with the work could cause accidents. A radical, or negative emotional type of mood could be influenced by external incentives and could express depression, fear, and confusion (Liu, 2012).

According to (Glendon I. , 2006) preventative measures for human error should be training, education, skill development, awareness, supervision, monitoring, inspections, and audits.

2.4. Awareness

The term Situation Awareness (SA) was introduced by Endsley, as a three-level process, which affects human decision. Level-1 of SA is the perception of the elements, Level-2 is the comprehension of the current situation, and Level-3 the prediction of future status. It was represented as a dynamic system, which depends on systems and individual's factors, such as long-term memory, workload, stress, system complexity, capability, confidence level and attention (Endsley M., 1995). Attention is limited on time length and this length is even shorter having to deal with big amount of information, multiple tasks, complex decision making, in a complex and dynamic environment, such as in an ED. Stanton approached SA by an interactive sub-system modeling which is based on past experience, interpreting the input information and the goals, Fig 8.

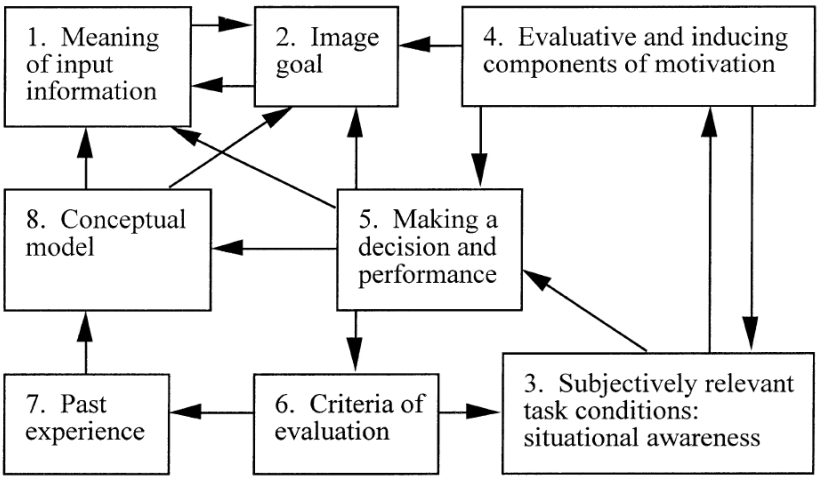

Figure 8. An interactive sub-systems approach to situational assessment (Stanton N., 2001)

Situation safety awareness of individuals, teams and systems, has been investigated on theoretical and methodological approaches (Stanton N. , 2009), (Salmon, 2008). Research in offshore drilling teams showed that high levels of stress and fatigue have a negative effect to work situational awareness and safety performance (Sneddon, 2013).

2.5. Leadership

Reason asserts that most occupational accidents, “have their origins within the managerial and organizational spheres” (Reason, 1993). Gallagher et al. noted that a health & safety management system could be established and effective, under one condition: a strong top management commitment (Gallagher, 2003). Additionally, the corroborated, determined top management commitment on safety could sway the employees to perceive safety as a social responsibility (Barling, 2002).

There is a correlation between “New leadership” such as the charismatic leadership, the transactional leadership and the influential transformational leadership, and improving safety performance (Glendon I. C., 2006). Transformational leadership has been associated with lower injury rates (Barling, 2002), (Yule, 2002).

Bass & Avolio have demonstrated the transition from a passive-avoidant leadership to a transformational by the “The Full Range Leadership Model” in Fig 9., and the transformational leadership, is based on the transactional leadership (Bass B. , 1985).

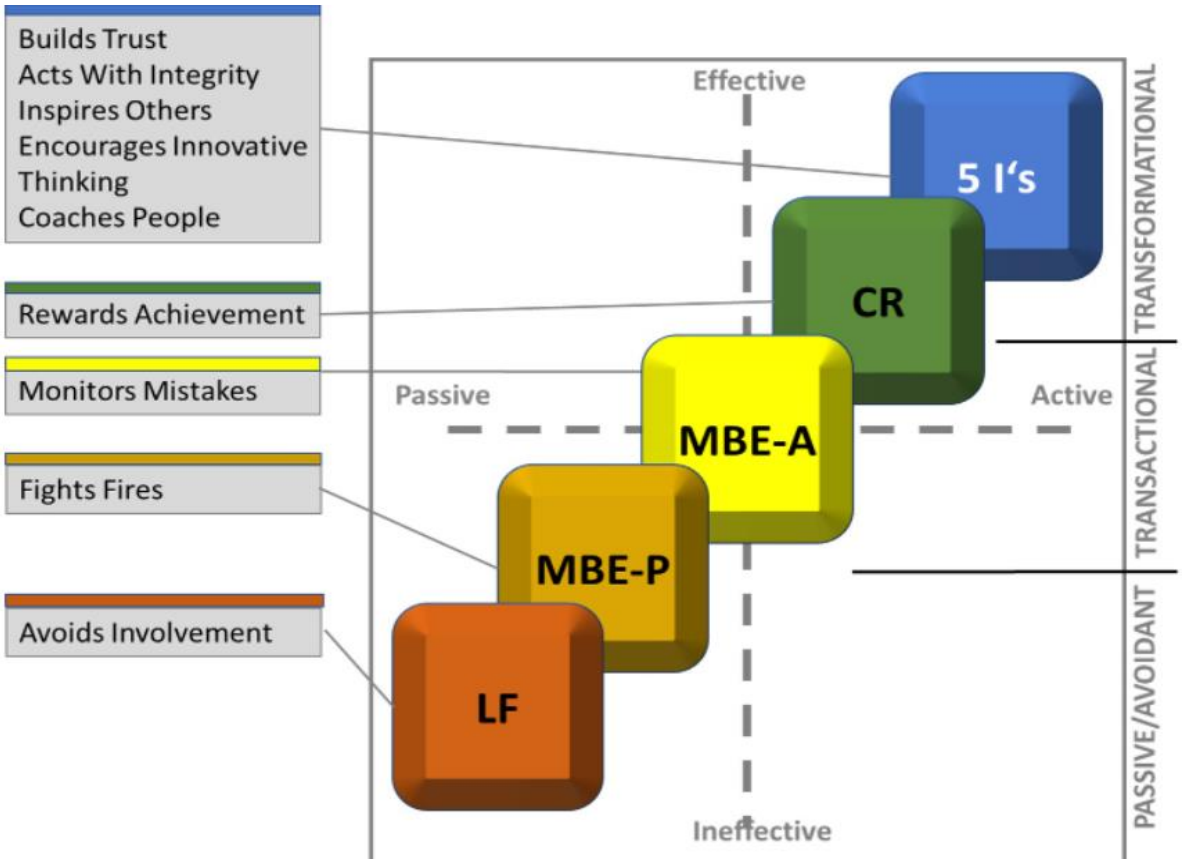

Figure 9. "The Full Range Leadership Model" (Bass B. A., 1994)

Transactional leadership, as it is shown in Fig.$$$, uses monitoring deviations and mistakes actively, and tries to prevent them before occurrence, which characterize it as an active management, in contrast with the passive-avoidant (or Laisser-Faire) leadership which fights fires. Transactional leadership also uses contingent rewards for the employees' achievements, and it is often found in manufacturing, maintenance, construction where the employees might work on shifts and they have to achieve certain goals or deliver a project at a certain time with limited financial resources (Michigan, n.d.).

Transformational leadership builds trust by idealized influence, which means that there is a personal relationship between the employee and the organization, and it is bilateral and asynchronous as a sum of the trustworthiness and the trusting. Hence trust in the organization starts from the executive level and it is spread by the organizational leader systematically via directives, by changing peoples' behaviors through motivation. It is often used the formula Trust = (Credibility + Reliability + Intimacy) / Self-Orientation (Green C., 2011). According to Schindler & Thomas (Schindler, 1993) Organizational Trust = Integrity (truthfulness) + Competence + Consistency on performance + Loyalty + Openness. A study on construction workers in UK, which is an occupation with the highest mortality, presented that integrity (measured through honesty) is the most important factor for trusting or distrusting their

supervisors (Conchie, 2011). According to (Barling, 2002) transformational leadership improves communication channels, as it encourages employees to address freely safety issues share their concerns about safety risks.

Intimacy is also a very important factor, as through the built personal relationship, the leader cares about employees' personal and professional development, he/she listens their needs and concerns, and as a result, the injury rate is decreasing (Yule, 2002). The attachment style between leader and employee affects how leaders give feedback and employees' psychological safety, feeling free to express themselves (London, 2023). There are three attachment styles, developed on previous experiences, a) the secure style, b) the anxious and c) the avoidance style. If at least one of the couple leader-employee is anxious or avoidant, unsettles psychological safety and mitigates the possibility of giving or receiving constructive feedback. Another recent research on psychological safety in athletes shows that openness and conflict management ensure psychological safety and coach-athlete relationship quality, as well as foster athletes' commitment and cooperation with their coach (Jowett, 2023).

Inspirational motivation is one of the 5 I's of the transformational leadership, where it will amplify the collective efficacy and creativity. Coaching leadership is characterized as a positive leadership behavior that influences employees' feelings, attitudes and behaviors through counseling, inspiring and providing the appropriated means (Heslin P. A., 2006). Trough inspiration, employees could overcome psychological obstacles, realizing self-worth and gaining self-confidence (Heslin P. A., 2004).

Tolerance on unsafe acts it is also one of the key elements for inspiring leadership. According to (Whittingham, 2004) when an organization ails from a blame culture shows symptoms like:

a) The employees try to hide their mistakes, because they are afraid of the blame.

b) There is no will of reporting mistakes.

c) The employees feel afraid to report the everyday stress they are experienced.

d) The employees' effort is not appreciated by the management and the staff lose their motivation.

e) The management decisions usually are taken without considering the employees.

f) Some of the employees decide to resign.

From these symptoms it can be concluded that if an organization ails from a blame culture, it blocks free communication and uses only one-way communication from top to bottom. This affects the intimacy and credibility, so the employees loose trust to their leaders and their management.

It is even worst when the organization practice punishment as a result of the blame culture. Choosing to fire the person that made the mistake is a retributive justice and it is not helping the organization to learn from its mistakes as it creates a blame culture, and when the blame is put to someone there is no further investigation. Restorative justice is chosen by an organization by admitting that the mistake is done by the organization and the person who made it is the valuable one who he/she knows what went wrong, and by sharing openly the information, the whole system will learn from that mistake. Admitting that the mistake-problem was caused by the organization as a system, sharing this information openly, in order to get lessons to learn and derive collectively corrective acts for the whole organization, builds trust within the organization (Dekker S. , 2016).

Performance coaching tends to focus on the way that the coach sets goals, overcomes obstacles and helps the coach evaluate and monitor their performance as they work towards their goals. This kind of coaching tends to be more strategic than skills coaching requires monitoring, evaluation and feedback. Developmental coaching is a step further of the performance coaching and adds the personal development, like enhancing emotional competencies, or communicating and working more effectively with and within teams (Grant, 2013).

3. METHODOLOGY

The methodology is designed for the research objectives that are defined above. This is a study on social research of health and safety. The steps this research is following is:

1) exploratory research in the beginning, collecting the necessary information, through literature research on safety culture, awareness and leadership,
2) descriptive research where the required collected information is described and

3) explanatory research where the results are explained through analysis and descriptive statistics.

The triangulating methodology was chosen, as it is a holistic approach to Occupational Health and Safety, through a hybrid approach of Safety-II and Safety Differently (Hollnagel E. , 2017). In this research several tools have been used, such as root-cause analysis, probability- impact matrix, risk data quality analysis, brainstorming, from different approaches for risk management, because after all the main issue is to avoid or mitigate the risk of having an occupational injury.
a) The cultural theory approach is used during the identification of hazards, as well as in risk communication, due to the fact it relates to the individual perception of risk.
b) The psychometric approach is also used as it relates to the employees' feelings which could demonstrate the current safety climate in the organization.

The system methodology has been used is the soft system approach where the organization is been examined as a cultural phenomenon. The chronological steps of collecting data on this study was:

1) Literature researchers.
2) Introductory interview with the head of Emergency Department at Heraklion in Crete, in order to gather the appropriated information for developing the questionnaire and the questions of the interview.
3) Interviews (Appendix B) with the director of Emergency Department in the 10 hospitals.
4) Survey questionnaire (Appendix C)
5) Projective techniques.

Qualitative analysis is applied, based on synthesis of the data (Appendix A), the interviews with directors of ED and my understanding of the environment and the workload of the ED. The focus group interviews are also necessary in order to find out *why* this is happening (Report, 2005). The director of ED is the responsible person of the ED operation.

Additionally, a quantitative method is applied in this study, based on one survey questionnaire, which was developed for the employees of the ED, in order to measure their safety climate, using the software SurveyMonkey. It was based on the NOSACQ-

50 which was developed by the National Research Center for the Working Environment in Denmark for occupational safety, in order to measure the safety climate of an organization and is widely applied in all Nordic countries (Kines, 2011). The two groups of employees were decided according to their vulnerability. The most vulnerable group is the group of employees who work at the work-floor of high-pressure calibration lines, (mounters, operators and warehouse employees) which is the one that accidents and injuries occur, so it is crucial to know their perception about safety. The questionnaire (Appendix C) has 59 questions, and it collects detailed information about employees' perception related to organizational communication, teamworking, leadership, employee involvement, learning culture, values, stress factors, risk and attitudes towards blame.

The questionnaire was sent as a link via an e-mail, to the head of the Emergency Departments by e-mail and they distributed it to all the physicians and nurses of their department asking them to answer it anonymously in a period of 20 days.

The employees had to answer the questions of the questionnaire anonymously, using a rating scale from 1 to 7 from "I strongly disagree" to "I strongly agree". The options in rating scale in the software SurveyMonkey were 1 to 2, 3, 4, 5 and 7. The scales that do not have a neutral point are 1-2 and 1-4, so they could force the respondent to take a positive or negative side, but they have short variety of choices, therefore the maximum scale 1-7 was chosen. The use of only a questionnaire could show much about "why" and "how" so it is necessary to have many observations in order to have a clear view of the employees' actual behaviors.

The questionnaire was designed in order to measure factors of the safety culture of the ED as well as the values of the ED staff. In the section teamworking (questions 4-11) the communication is measured, as well as equality, solidarity, conflict management, built trust, and psychological safety. In the section Learning Culture (question 12-18) the openness is measured for reporting and learning. In the section Job Satisfaction, (question 19-24) it is measured the staff's job satisfaction and why they are satisfied / dissatisfied. In the section Stress recognition / Awareness / Anticipation (question 25-32) it is measured if the staff is able to recognize the stages of physical fatigue, stress and disturbance and proact accordingly. In particular, questions 30-32 are measuring the stress due to patients complains. In the section Perception of Management (question 33-37), it is measured the staff perception about all levels of management, and their commitment to facilitate the ED staff and assure patient's safety. The Safety Management Systems section (question 38-47) it measures the use of Safety Management Systems and the staff's perception about their effectiveness. In particular, questions 44-47 are focusing on the morbidity and mortality meeting and its effectiveness. Questions 48-50 are measuring the working conditions in ED. Questions 51-55 are measuring the leader-employee attachment and the psychological safety that is created. Question 56 is measuring the most

important factor of ED's success. Questions 57 and 58 are measuring the important characteristics in leader's personality (Conchie, 2011). The question 59 measures the perspective quality of the offered service.

4. INTERVIEWS WITH THE DIRECTORS OF HEDs

Ten interviews were carried out six with the Head of the ED of the 10 hospitals that participated in the survey (Annex A). The questions were about the safety climate in the ER, and they were common to all of them. They were divided into seven chapters: 1) Demographics, 2) Management, 3) Existing safety management systems, 4) Teamworking, 5) Problems.

4.1. Demographics - Statistics

The Greek national health system is still facing a crisis after COVID-19. All the directors mentioned that their department is understaffed 20-30% and their departments have a vast number of patients to serve (1000-530 patients in one shift) (Annex C). Most of the patients who visit ED in every hospital, do not need an emergency treatment, and they should have visited a general practician. As a consequence of the high traffic and understaffing, the medical staff in ED is overloaded. In Athens the hospitals are in 24 hours emergency duty every 4 days. The hospitals in touristic places are in emergency duty every other day, which means that there are only two hospitals in the region. Although the staff in emergency department does not work more than 38 hours, according to EU regulation, because the working hours are during day, night and weekends, the staff does not have enough time to rest, or to have a whole weekend with his/her family.

4.2. Management

None of the directors had any training on managing personnel, as it is not even an option as a training for physicians, but they are practicing a warm and caring communication due to their values, and can be characterized as a human relation profile, as shown at Fig.5 (Colley, 2013). They organize the monthly schedule of shifts in discussion with the staff for a smooth operation, so everybody knows well in advance when and where is working. The ED is divided into the waiting area, the triage ward, the resuscitation ward, the trauma ward, the fast-track ward, and the wards of specialisms. Small hospitals do not cover all the specialisms. The physicians operate in the relevant ward according to their specialisms. Some directors have a briefing before the start of the emergency duty and all the directors have a debriefing at the end of the duty, discussing shortly the outgoing problems during the duty.

The main themes in the meetings are reducing the delays and waiting time, and dealing with complains and hostile behavior. Applying the triage system, the majority of the patients in EDs do not need an emergency treatment, but a fast-track examination. During the fact-tack examination the general practicians should give to the patient a diagnosis with a short-term treatment and possible directions of additional treatment from the primary care general practician or specialist. Although, fast-track treatment is more the half of the workload, most of directors' perception is that ED should offer this kind of service, even though it is not designed for that, because

patients do not have any other option. Few directors who serve 24 hours emergency duty every four days, have focused on settled goals such as the waiting time to be less than one and a half hour and have tried to inspire their personnel to be effective and efficient. The directors who serve emergency duty every day, or every other day, try to inspire their personnel mostly to withstand the overloading.

Most of EDs' personnel is dedicated and they love their job. The dissatisfied staff is about 20%. They would like to work in another department and working in ED was their last choice. Most of the directors do not give permission to their personnel to be transferred, because they already work understaffed, and they cannot withstand any further reduction in personnel. One director has a different approach to the unsatisfied personnel. She believes that nobody could be forced to work and do their work effectively and efficiently, so she gives permission of personnel transfer to another department, preferring to work only with dedicated personnel.

According to the Greek regulation, the new staff in a department has to serve at least five years in it and then could be allowed to be transferred to another department, but this is not always permitted by the hospitals' management. Due to the staff transfers, directors have strong negotiations with the hospital's top management, which creates tension. Few directors mentioned that they have a good relationship with their top management, due to specialized knowledge and working experience of the top managers, which is unusual in Greek hospitals. This type of managers are good listeners and try their best in managing. Directors have tried to solve staff's scheduling problems through discussion and negotiation, in order to include training for their personnel's development. Training is the first priority, and it is scheduled in rotation because EDs are already understaffed. All directors design and monitor their staff customized training. Especially for the physicians who serve in hospitals that have emergency duty every four days, the rest of the time after the duty, it is spent on training.

4.3. Safety Management Systems

The main safety management system that is widely used is the use of protocols. The hospitals in Australia follow a unique system of protocols across the country. In UK, hospital could adopt the Manchester district protocol, or to create their own. In Greece every hospital is running according to its needs and capabilities and there is not a governmental authority the establish them and assure that all the Greek hospitals will apply them. This means that most of the hospitals use protocols (Rosier for stroke, HEART for coronary diseases, National Early Warning Score 2, and Emergency Severity Index) from other countries such as UK, Australia, etc., for the most serious cases and due to overloading and lack of spear time, it is difficult to create and follow new ones. All the directors mentioned that their staff is following the available protocols for the most crucial cases, but they are few, and it is mandatory, more protocols to be established. Everybody mentioned that the protocols are mandatory for

standardization of the medical service and assuring the quality of a safe service to every patient. Following protocols creates delays, and here is the oxymoron, the protocols are used for assuring the patients' safety, the patients they are complaining about the delays.

The established safety management system for morbidity and mortality is established as an initiative by certain directors who had been trained and worked as emergency consultants abroad and they have adopted the Australia's or UK's organizational culture. The National Confidential Enquiry into Patient Outcome and Death in the UK is dealing how to conduct a national enquiry, starting from the selection of the topic, up to conducting the final report or article (Manson, 2017). Confidentiality, legal consequences, psychological and cultural barriers, hold back physicians of stepping out and admitting a mistake. Emergency medicine is a new post-specialism in Greek hospitals. Before the establishment of the emergency academic studies, the emergency departments were staffed by consultants or experienced pathologist, cardiologists, orthopedics, general surgeon, and general practician. Even now, in lack of post-specialized emergency physicians, the above-mentioned specialisms are hired as permanent staff of ED, as well as additional staff from the hospital's clinics to the ED during the hospital's emergency duty. This means that the directors of ED must communicate the different working culture of ED in comparison with the clinics, according to immediate response and quick stabilization of patient's functions. Due to the vast number of patients served in a short period of time, the physicians who are not specialized as emergency physicians feel uncomfortable to face that crisis and they are afraid of the legal consequences of reporting their possible error in a morbidity and mortality meeting. Few directors have encouraged and finally persuaded their staff to speak up about cases that their result could have been prevented. This meeting is only for learning matters, and it is carried out the next day of the emergency duty for the hospitals that have emergency duty every 4 days, and once a month for the hospitals that run emergency duty every other day.

Another safety management system is called "Safe hospital" which is an emergence plan for different emergency cases, such as heart attack, fire, missing patient or child, etc, and is color rated. This system is implemented only in few hospitals, but the personnel is not trained for that, or/and there are not established the crisis management team which should be involved for each case. Some hospitals do not even have provided a drill evacuation, and one ED operates in the basement, and it does not even have a second exit door.

4.4. Teamworking - Communication

Working overloaded, under time pressure, the good communication and teamworking spirit are mandatory. All directors characterized their team's communication as friendly. Sometimes they might lose temper, due to high time

pressure and stress, but this is instant and does not have a long-term effect. Most of the staff in the EDs are using the plural of courtesy, a polite-formal form of language within the team, although in their breaks, they might use informal language, for protecting hospital's service and image to the patients. In Greek culture, authority and ranking should be expressed through speaking language. It is extremely rare and unpolite a subordinate to address to his/her director in single tense, and they could be characterized as relatives or impolite, so all the medical staff is addressing to the directors of the hospital in plural of courtesy language. In this friendly and polite atmosphere everybody could address any problem within the team. Usually, physicians have closer relationships among themselves as well as the nurses. All the directors see some of their staff in social events outside of working hours, and they organize events for all the staff two-three times per year.

4.5. Problems

All the problems are related to political decisions for the national health system. The primary health system is understaffed, and a patient might wait for three – six months for an appointment with a consultant physician, or a patient with a flu, could wait ten to fifteen days to have an appointment with a general practician. Due to these delays, most of these patients decide to visit nearest ED and as a result a vast number of patients who visit ED do not need emergency aid but primary health care.

Understaffing in conjunction with the high number of patients per shift, creates a chaos in EDs, with delays and bottlenecks, and the variation of the number of the medical staff could augment the bottlenecks. This could create difficulties in scheduling staff's vacations and training. The directors that have emergency duty every other day, usually take a subordinate's duty, when the subordinates have a conflict for their days off. This means that most of them they are not taking the whole number of vacation days, and some of them they were not taking at all vacations for the last 3 years, and that was the reason of resigning. It should be mentioned that two directors of ED, in Agios Nikolaos (region of Crete), and in Chania (region of Crete) gave an interview for this study, have already resigned. In particular, the director in Chania hospital's ED mentioned that he started working with three physicians, he strongly claimed for the anticipated medical staff of nine physicians, who were recruited, but lately six of the nine physicians were transferred to hospital's clinics, and he had to run the ED with three physicians, despite his complains, giving emergency service every day, as it was the only one hospital in the whole region. That was extremely stressful and exhausting, and as a result he had a supraventicula tachycardia. After that heart misfunctioning, he decided to resign, in order to save himself from that stressful situation, as he could not have additional staff in the ED. Obviously, resigning was their last option, after several requests for hiring the adequate number of personnel had been ignored from the Ministry of Health. Every director has requested at least 4 times per year to the head of the hospital, who they forward the requests to the Ministry of Health. It should be mentioned that during the last decade twenty thousand of physicians have

resigned. It is a political decision to leave the hospitals understaffed and put the patients' safety in risk as well as reducing the quality of medical staff life.

Some hospitals are understaffed in nurses, so physicians have to perform nursing duties. Greek hospitals are understaffed not only in medical staff, but also in supportive staff and ambulances. All directors mentioned that about eighty to ninety percent of the recorded deaths in the ED, have occurred in the ambulance. The long distance, in conjunction with traffic jam, and few available ambulances with no highly qualified staff, create a highly risky transfer to the ED for the patients. When the patient arrives at ED has a priority, according to triage system of Emergency Severity Index, that is performed by a senior physician.

Physicians in ED have two main challenges, the risk identification, and the fast response. The fast response relates to cognition, but also relates to the number of physicians and the number of patients. Hiring supportive and medical staff is a direct solution, with direct results, especially in the districts that have only one or two hospitals. Enhancing the primary medical care, will decrease the number of patients who visit the ED for a flu or minor orthopedic issues. Additionally, the number of patients visiting ED in one shift, could be decreased, if in large-populated cities, like Athens, the hospitals are on emergency duty every two or three days, instead of four, which means that more hospitals will be on duty the same day, so the patients would be distributed. According to Annex D, for Thursday 27th Apr. 2022, in Athens with six million citizens, with an average of five hundred thousand tourists, from 8:00-14:30 only two hospitals are on emergency duty, for pathologic, cardiologic, and surgical, (orthopedic three hospitals), and from 14:30 till 8:00 the next day, four hospitals for these specialisms. Having one thousand of patients to take care in twenty-four hours, it is a crisis case that has become regularity. The directors clearly mentioned that if the EDs had to serve the half of the patients they usually serve, all the teams would have the adequate staff to prevent almost any mistake.

All the directors mentioned that these suggested ideas have been communicated to the Ministry of Health through the unions in written form, underlining the risks. It is not certain if the hospital directors have strongly requested these, because they are selected by the Minister of Health, because they belong to the political party which governs. Some of them, due to the lack of competences, does not want to have any conflict, or negotiation with the Ministry, in order to keep their job as long as possible. So, although they hospitals' directors accept the employees' claims, they do not demand these claims to be satisfied from the Ministry of Health, leaving their staff to work in horrible conditions, overloaded, in small facilities, overcrowded, with bottlenecks of medical disposables supplies. Most of physicians feel trapped, because the political decisions made them suffer while working at the job they love.

The only advantage in the relation between the hospitals' management and the staff of the ED, is that whenever they apply for any training, participating in conferences, inviting consultants for giving a seminar, their application is always

approved. So, it is assured their development while working in the hospital. It should be underlined the education system for the physicians in the Greek National Health System, in order to work in an emergency room. The specialized physicians as pathologist, cardiologist, general surgeon, or general practician, have six-years studies to graduate from the medical school as physicians and then another six years postgraduate studies for the specialization. After that they have another two years of studies in emergency medicine. Seniority of working experience is five years for the first level of consultant. So, as a conclusion, the Greek education and training for physicians is in high standards and extremely demanding and develops physicians with high competencies.

Due to the high psychological stress in the working environment, all directors play a role of mentor and psychotherapist to their staff, in order to support them to withstand that crisis. As mentors they are focusing on constant training and education of their staff, by coupling the beginners with consultants and enhancing the constant teaching and monitoring through the day, as well as working equally as a full-time physician. As psychotherapists, they listen stressful experiences, arbitrate conflicts with the patients and the staff, remind them their values and Hippocrates' oath, and support them psychologically. It is characterized as coaching leadership, but I dare to characterize it as Spartan leadership including empathy and mercy.

5. RISK IDENTIFICATION – RISK SCREENING IN HEDs.

5.1. Stress factors in emergency department and awareness

At every emergency department, the personnel experience physical stress every day, due to the crowded, noisy environment, the workload and fatigue. According to the answers on the &&& questionnaire, the interviews, and my personal experience as a patient, working in an ED in Greece, is a very stressful experience due to political decisions, organizational and psychological factors which are analyzed in this chapter.

Due to political decisions, all EDs are understaffed, the medical staff is not well-paid, and the sequence of hospitals' duty is not functional. Additionally, the primary health care has discredited by the political decisions, and it has underperformed. As a result, a vast number of people visit an ED, instead of their general practician. This could create a chaos in the ED, a crowd throngs in an area that is not designed to support this number of people. Additional to the crowd of patients, the family members accompany patients worsen the ED's fullness. Although they could give significant patient's medical information to the ED's staff, they also claim information about investigations, ongoing treatment and want to be included in decision making (Peguero-Rodriguez, 2023). which generates noise, tension and complains about the delays. So, the medical staff operates in a hostile environment.

The nature of the medical occupations, especially the physicians have faced psychological stress due to mandatory accuracy of their operations and the fact that they are not allowed even by themselves to make mistakes. Emergency medicine requires immediate response, and the entire operation should be completed under time pressure. Due to the lack of staff everybody asks for help from a colleague when is necessary, which means that everybody is frequently interrupted and must judge the severity of the two cases, whether he/she will offer his/her help immediately or later. The final decision for the severity of the two cases is taken by the senior physician in the ward. A research on 36 nurses in 2 Australian hospitals, observed for 136 hours, on 3,441 event, they had 1,354 interruptions, 46 hours of multitasking, and 200 errors (Kalisch, 2010). Another research on ED's staff showed that senior staff experienced higher rates of interruption than junior staff (Spencer, 2004). Working at night is another stressful factor for the human body and all the medical staff in EDs outside Athens, have a night shift at least two times per week. Due to the complexity of the emergency medical cases, and the time pressure of the mandatory immediate response, there is also mental fatigue.

Due to the vast number of patients per shift, in an understaffed ED, the lack of resting time during the shift is also a cause of a human error. Only the personnel who treats trauma, that statistically are the minority of the cases visiting ED, might have some rest during their shift. Medical occupations include physical involvement and due to lack of supportive personnel in Greek ED, the physical involvement increases, creating physical fatigue. According to the EU regulation the medical staff in EDs

should work maximum 48 hours per week, so working overtime is quite rare. Although the physicians who work outside the capital of Athens, they do not work more than the limit, they do not have much time to rest after their shift and before their next one.

Another organizational risk factor for patient's safety and stressful factor for the medical staff is the incomplete or missing verbal or printed information of the patient's health record. "Unreliable interprofessional communication can impact the quality of change-of-shift handovers in EDs and poses risk to patient safety" (Redley, 2017). In most of the Greek EDs, due to the lack of administration personnel and the lack of digitalized records of patients, the missing hardcopies, the poor written, or verbal description, create delays, bottlenecks and tension in the workflow, and they instate risk to patient safety. Due to the high personnel's awareness for the importance of the information for their decision making, the medical staff could be extremely stressed while seeking the information, and they could even misbehave. Working in a tensed or hostile atmosphere is stressful for the employees, as well as the patient that receives that poor quality of health service, doubting about his/her safety. In crisis or in a chaos, people usually loose sufferance and put a blame to the person that made the mistake or to anybody. The blame culture is hazardous for an organization, as it creates underreporting of the mistakes and a fearful and stressful atmosphere (Whittingham, 2004). According to the interviews, if an employee misbehaved due to someone's mistake, it was instant and always he/she apologizes, taking his/her words back, as he/she understands the chaos they are working in, which creates mistakes, and this situation should be accepted.

According to interviews and the questionnaire, the most toxic stressful factor, for all the medical staff is the complains about delays, that sometimes are expressed with verbal or even with physical violence by the patients or their companions to the medical staff. Even a polite complain annoys them because it is an unnecessary interruption and creates extra delay. According to all above mentioned, based on a synthesis of the data, the interviews and personal experience as a patient in a Greek ED, the stress factor screening is demonstrated as follows on Table 1.

At the stress factor screening for the medical staff during working in an ED in Greece, at Table 1., can show that almost all the factors have really high probability of severity and high frequency. The high probability of severity all of the stress factors simultaneously and their high frequency of occurrence increase the risk on patients' safety and the quality of health service is offered decreases. When many stress factors of causing human error, occur simultaneously, the probability of a human error occurrence increases, posing patients' health in risk. These results lead to the main question: "How is it possible, someone who experiences that high level of stress to like, be able to continue working in that job?"

5.2. Probability- Impact Matrix

Type of cause	Cause	Stress factors	Severity 1-5	Frequency 1-5
Environmental	Crowded in small space	Many actions in the same area	5	5
		Disease transition	5	5
		Not enough fresh air	5	5 in some wards
		Noise	5	5
Specifications of the job	Emergency aid	Accuracy	5	5
		Time Pressure	5	5
		Working at night	5	3 for Athenians 5 for the rest
	Physical involvement	Physical fatigue	5	5
	Complexity	Mental fatigue	5	5
Political Decision	Few hospitals on duty	Overloaded (no. of patients / shift)	5	5
	Low salary	Not well-paid	5	5
	Understaffed	Overloaded (no. of patients / physician)	5	5
Organizational	Lack of personnel	Working overtime	5	1
		Not enough time for rest during a shift.	5	4 for trauma 5 for all the rest
		Not enough time for rest after a shift.	5	2 for Athenians 5 for the rest
		Interruptions	5	5
		Doing work of supportive staff	5	4
	Lack of digitalized system	Not clear, or missing information	5	4
	Organizational culture	Blame culture	5	2
Psychological	Colleagues losing temper	Tension within the team	4	3
	Delays	Complains / violence expressed by the patients	5	5
	Difficult working schedule (nightshifts, long shifts)	Family issues	5	?
All the above			5	5

Table 1. Stress factor screening in ER

6. ANALYSIS OF THE QUESTIONNAIRE RESULTS

The questionnaire was sent to 11 EDs where work in total 85 specialized physicians, 51 trainees in specialism and &&& nurses. The responders were 23 specialized physicians, 10 trainees in specialism 9 nurses, and the total size of the sample is 43. 54% of the sample are specialized physicians Fig.10

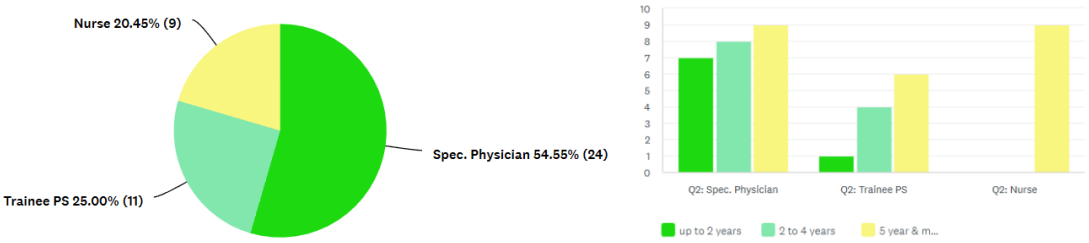

Figure 10. Distribution of participants and experience.

The total sample size is adequate as it is over 30 respondents, but the sizes of each group are not sufficient. So, the measurements for the total sample will be in percentage and the groups would be referred by number of people that agree or disagree. That is because if 1 person disagree over 9, for example nurse, gives 13% and if 1 physician disagree, over 23 physicians, gives 4%. The people who answer, “strongly agree”, “agree” and “somewhat agree”, have been considered as AGREE. The answers “strongly disagree”, “disagree” and “somewhat disagree” have been considered as DISAGREE. The answer “neither agree nor disagree” is the neutral point. The specialized physicians will be written as SP, the trainee physicians in specialism will be as TPS and the nurses as N.

6.1. Teamworking – Psychological Safety

At Q4*.” I have the support I need from other personnel to care for patients.”* 80% answered AGREE. 1 person answered disagree and 6 somewhat disagree. The least satisfied are the trainees TPS=3, then the nurses N=2 and SP=2. This means that the teamworking spirit is well expressed. At Q5 “Nurses’ input or feedback is well received in this ER.”, only 2SP, 1TPS and 2N DISAGREE, which means that there is no discrimination within the teams, related to educational backgrounds. This complies with Q8 “The physicians and nurses here work together as a well-coordinated team in this ER.”, where only 1SP and 1N somewhat disagree Fig.11.

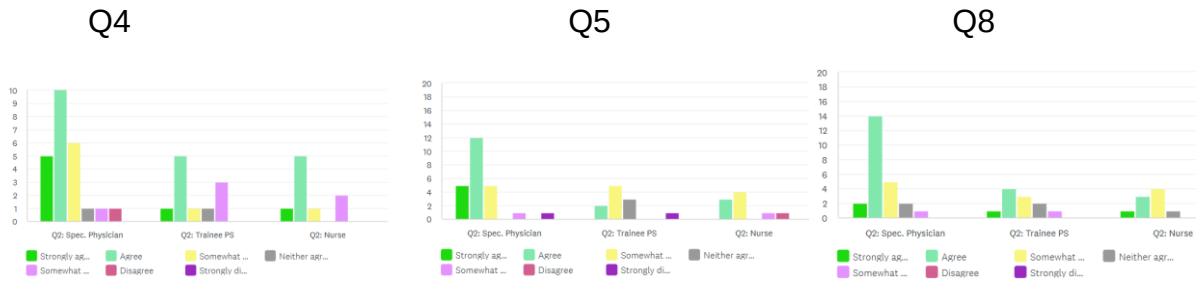

Figure 11. Teamworking (Q4), (Q5), (Q8)

Q6 “In this ED, it is easy to speak up if I perceive a problem with patient care.”, is about psychological safety and shows that the most psychological safe are the nurses, as no one disagreed with the question, then 1TPS somewhat disagree, and 3SP DISAGREE. This means that in all investigated ED, the personnel feel psychological safe to express problems Fig 12. The Q9, ”I feel safe, in case I make a mistake, somebody will correct me on time.”, is about the micro-adjustment within a team while performing, for performance improvement. In this case relates to teams’ awareness for patients’ safety. Only 2SP out of 24 and 1N out 9 have chosen DISAGREE. The least confident are the TPS as 5 out of 10 have chosen DISAGREE. This could be due to that the TPS in most of hospitals, do not belong in the EDs, they belong to the hospitals’ clinics, and they are giving their services when the hospital has emergency duty, in rotation. Only 3 out of 10 hospitals have permanent TPS in their EDs. So, TPS in 7 hospitals out of 10, are like visitors in the ED and they have not gotten a good bonding with the rest of the team in EDs.

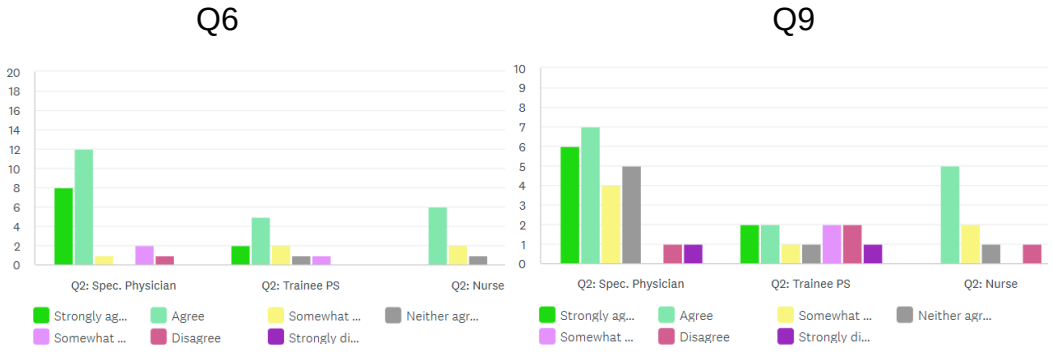

Figure 12. Psychological Safety (Q60, (Q9)

Q7 is about the ability of the team to solve smoothly conflicts, where 3SP, 4TPS and 2N answered DISAGREE and 31 answered AGREE, which implies smooth communication within the teams Fig.13. Q22 “Working in this ER is like being part of a large family.”, 1SP, 2TPS, 1N, overall, 4 people DISAGREE, and 32 AGREE, which means that only the 10% is not satisfied with the working relations they have.

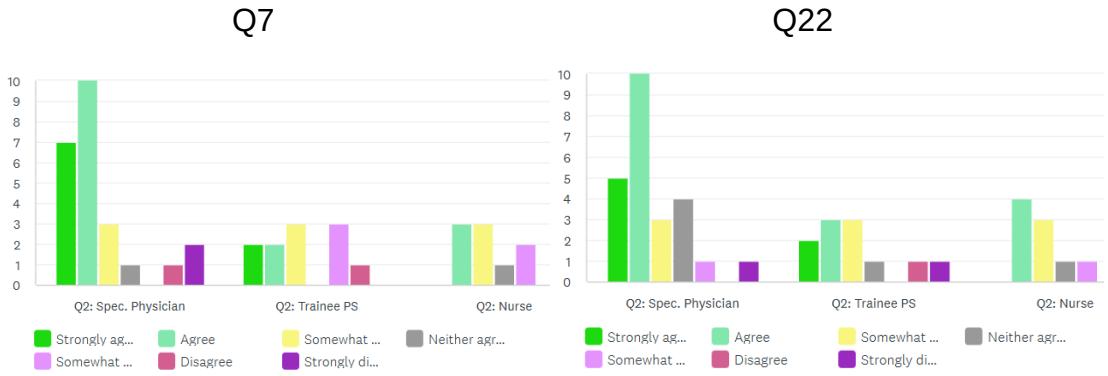

Figure 13. Conflicts & Team-bonding (Q7), (Q22)

According to all above the teams in HEDs work in psychological safety and strong teamworking spirit and strong team bonding, in order to withstand the everyday crises, they are facing.

6.2. Learning Culture

Q10 “Trainees are adequately supervised.”, where 2TPS DISAGREE, 3TPS neither agree nor disagree, and 5 AGREE, which means that only 50% is clearly satisfied with the supervision. Q16 “I receive appropriate feedback about my performance.”, 2SP, 3TPS, 2N, total 7 people DISAGREE, and 33 AGREE., Fig.14.

Q10 Q16

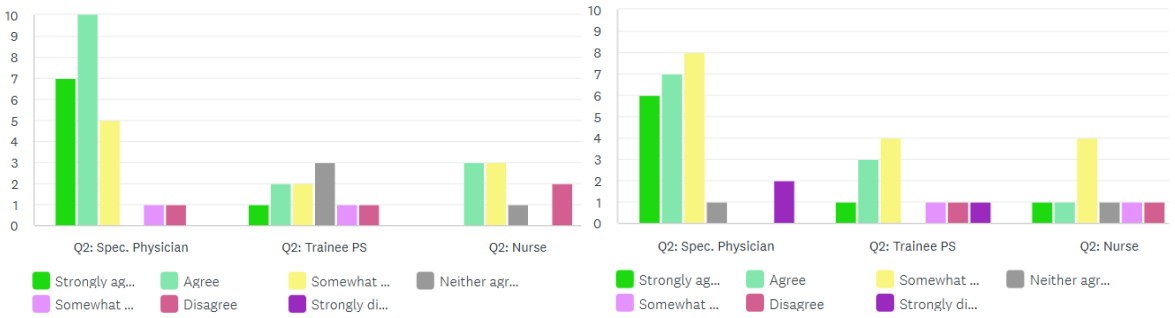

Figure 14. Supervision (Q10), (Q16)

Q11 “This team in ER does a good job of training new personnel.”, where 3TPS DISAGREE, but only 1SP and 1N have the same opinion. At Q50 “This hospital does a good job of training new personnel.” 27% DISAGREE. Fig.15. Comparing the answers of two questions, it can be noticed the three groups show higher dissatisfaction at Q50 who negatively rated the training strategy of the hospitals. Especially the TPS for the ED’s training the 30% is dissatisfied, and for the hospital’s training the 60% is dissatisfied.

Q11 Q50

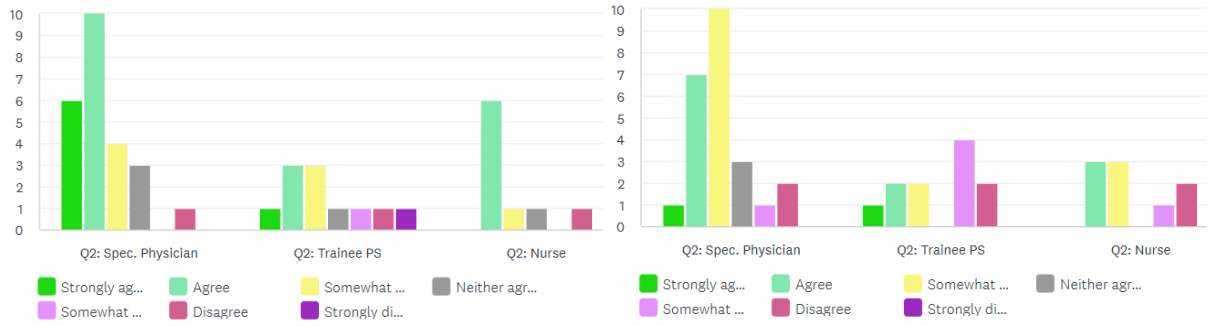

Figure 15. Training (Q11), (Q50)

At Q12 “The culture in this ED makes it easy to learn from the errors of other.”, 4SP, 4TPS, and 3N, total 11 DISAGREE and 24 AGREE Fig.16. At Q13 “Medical errors are handled appropriately in this ER”, 3SP, 5TPS,1N, total 9 DISAGREE and 27 AGREE.

Q12 Q13

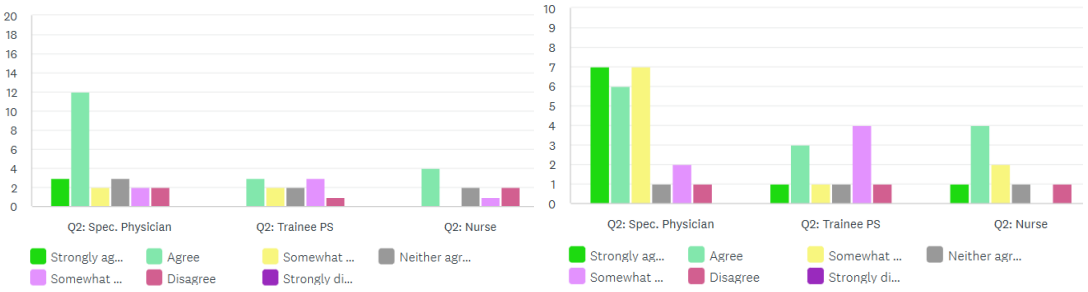

Figure 16. Learning culture (Q12), (Q13)

Q15 “I am encouraged by my colleagues to report any patient safety concerns I may have.”, and Q18 “In this ER, it is not difficult to discuss errors.”, measure is EDs’ staff feel psychological safe if they make a mistake. At Q15 3SP, 2TPS, 1N, total 6 people DISAGREE, over 29 AGREE, Fig.17. At Q18, 5SP, 3TPS, 3N, total 11 people DISAGREE, over 28 AGREE, which means 3/4 of the staff feel safe to report or discuss their mistakes. Compering the two questions, it can be concluded that although the staff is encouraged to report any patient safety concerns, they found some difficulties to discuss errors.

Q15 Q18

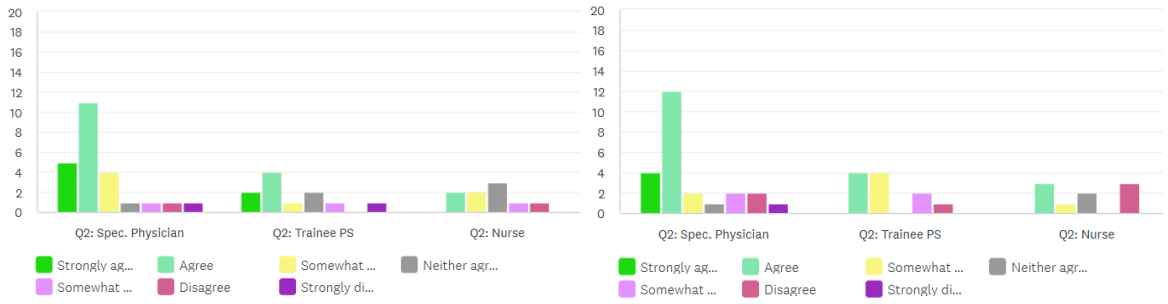

Figure 17. Psychological Safety in Learning (Q15), (Q18)

The last 6 questions measure the learning culture of EDs and more than the 3/4 of the staff believe that is quite well. Psychological safety enhances learning culture in medical occupations.

6.3. Job satisfaction

Q19 “Compering with other departments, I prefer to work in ER.”, 2SP and 3TPS strongly disagree, and 33 people AGREE, which means that 11% would like to work in a clinic and not in the ED, Fig.18. This is the “trapped” personnel that either the legislation, or the director of the department do not let them to be transferred. Q20

"Compering with other hospitals, I prefer to work in this one. (Location is irrelevant)", 2SP, 2TPS,1N, total 5 people, 11% of the staff would like to work in another hospital.

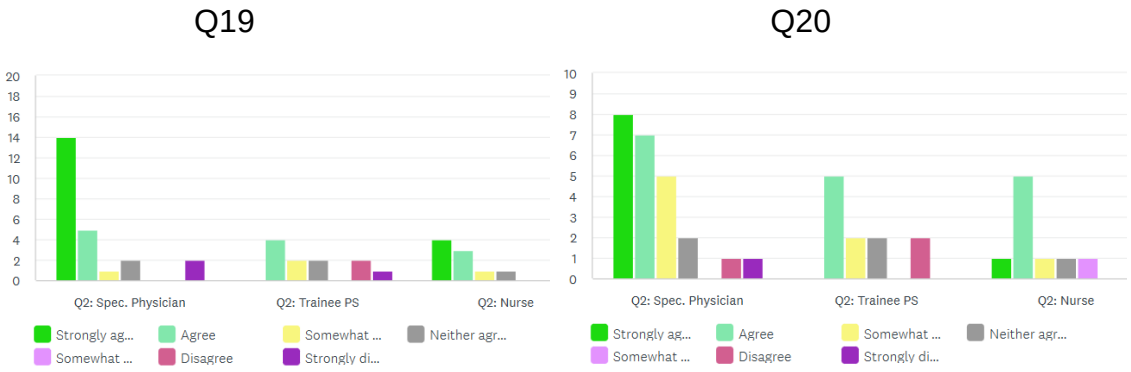

Figure 18. Job preference (Q19), (Q20)

Q21 "I am proud to work at this ER.", 2SP, 3TPS, 1N, total 6 people DISAGREE, over 32 people that AGREE, Fig.19.

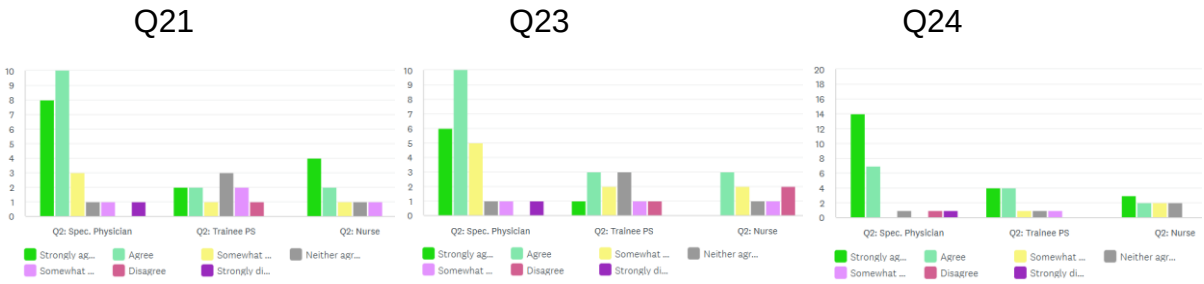

Figure 19. Job satisfaction (Q21), (Q23), (Q24)

Q23 "Moral in this ER area is high.", 2SP, 2TPS, 3N, total 7 people DISAGREE, and 31 AGREE. Q24 "I like my job.", only 2SP DISAGREE, which is 5% of the staff, and 36 AGREE with the question.

From the above questions, the interviews, the stress factor screening, and the author's personal experience as a patient in an ED, it can be concluded that medical staff in EDs is dedicated, and their work relates directly to their identity. They cannot be something else, they are physicians and nurses, they love to give their service to the patients, and they want to carry on doing it. As a patient, I am glad for their existence.

6.4. Stress recognition / Awareness / Anticipation

At this section is measured the stress recognition and awareness that could affect patients' safety. At Q25 "When my workload becomes excessive, my performance is impaired.", only 13SP AGREED, 8SP DISAGREE and 3SP neither agree nor disagree. 54% of the SP believe that excessive workload could affect that performance, Fig.20. This low percentage could be explained by the fact that a lot of

them push themselves that much that finally have health problems due to exhaustion. On the same aspect is Q27 “I am less effective at work when I am fatigued.”, 5SP, 1TPS, and 1N DISAGREE. 14% of the personnel in EDs believe that fatigue is not affecting them. Q28 “I ask for help, or double check, when I am fatigued.”, only 2SP and 1TPS somewhat disagree. This shows high risk awareness for almost all the staff in EDs.

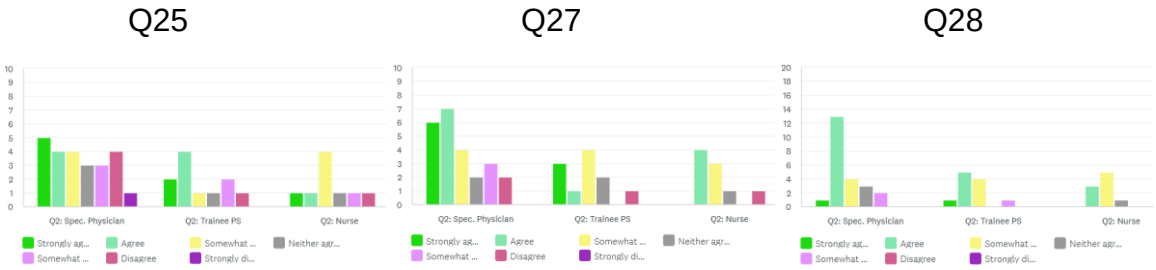

Figure 20. Workload and fatigue perception (Q25), (Q27), (Q28)

At Q26 “I am more likely to make errors in tense or hostile situations.”, 2SP, 2TPS and 1N DISAGREE, which means that 88% that good working relations and in a calm atmosphere are mandatory for their best performance, Fig. 21. Q29 “I notice of objects/events in ED even if they are not immediately related to my work.”, only 1SP and 1TPS do not notice objects/events in ED, that are not related to their job, which means that the staff’s attention is alert.

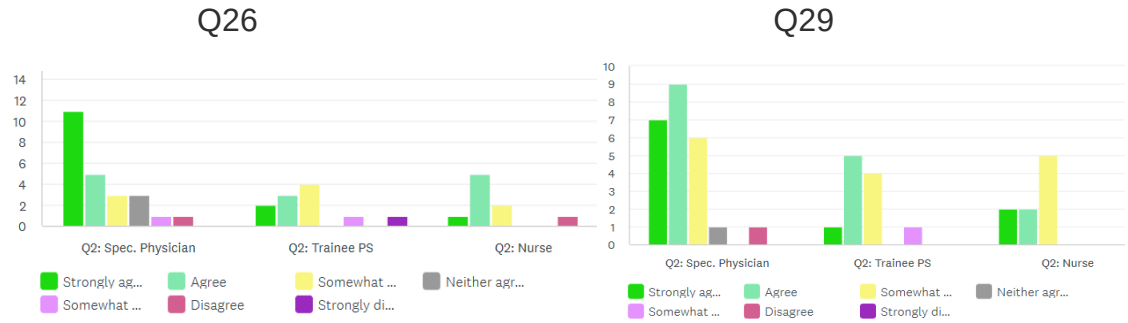

Figure 21. Awareness (Q26), (Q29)

Q30 “I am disturbed / annoyed / sad when patients, or their relatives complain or have an argument about delays.”, only 2N DISAGREE, all the rest AGREE, in particular, 50% of SPs and 30% of TPS strongly agree, Fig.22. According to the interviews this is the most irritating and disruptive issue that physicians facing every day and consumes valuable time. Q31 asks to rate (1-10) the frequency of quarrels in their working environment, Fig.23. The Q32 asks how often a violent event occurs in their working environment (never, seldom, every 10 duties, every 5 duties, every 2 duties, every day), it is shocking that 6% of the staff faces violence every day and only another 6% have never faced violence in his/her working environment.

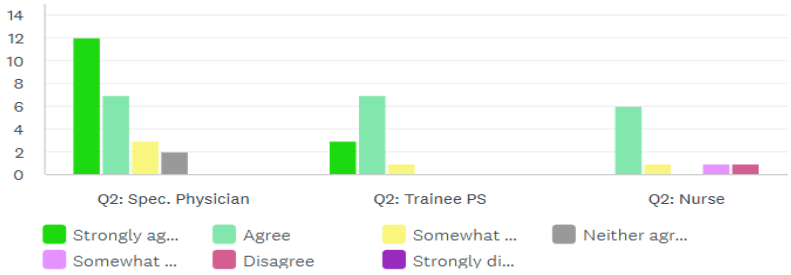

Figure 22. Disturbance (Q30)

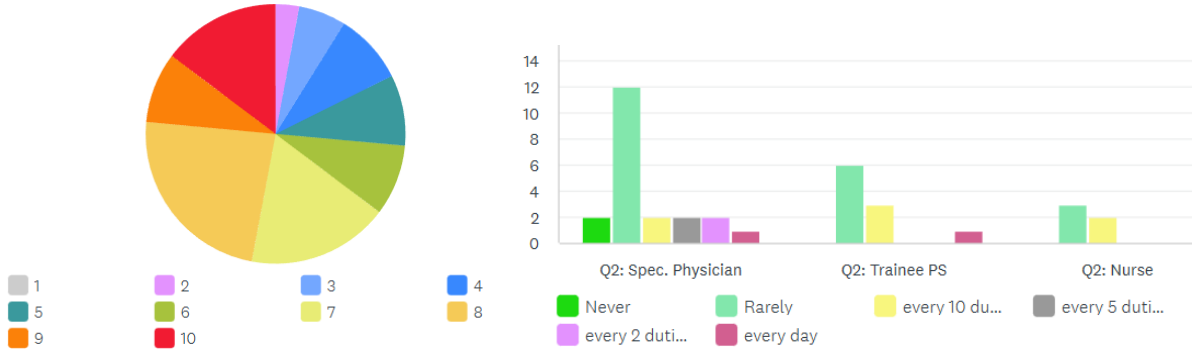

Figure 23. Frequency of quarrels (Q31) & violent event (Q32)

6.5. Perception of management

This section measures the staff's perception of top management and its commitment in providing quality service and preventing posing patients' safety at risk. At Q33 "Hospital management does not knowingly compromise the safety of patients." 37,2% DISAGREE, and 37,5 AGREE. It can be seen at Fig. 24, that 42% of SP wanted to keep a neutral position, and the other two groups expressed clearly their positive or negative opinion. At Q37 "The management of the hospital listen carefully and takes seriously staff complains." 51% DISAGREE and 21% AGREE, Fig. 24. This means that the EDs' staff feels that the top management does not consider their problems and it is not convinced about the top management competence and commitment in patients' safety. The most dissatisfied personnel with the top management, are the nurses were 55,5% DESAGREE and the rest neither agree nor disagree. In total 50% of the staff DESAGREE

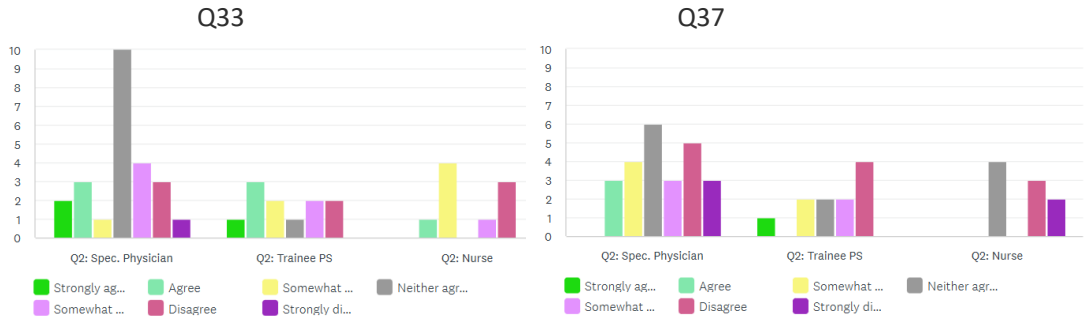

Figure 24. Top Management (Q33), (Q37)

At Q34 “Ministry of Health does not knowingly compromise the safety of patients.” 46,5% DISAGREE and 39.5% AGREE, Fig.25. This means that the EDs’ staff believe that the HMH decisions pose patients’ safety on risk. This relates to Q36 about understaffing. At Q36 “Staffing in ER is sufficient to handle the number of patients.”, 74,5% of the staff believe that ED is understaffed.

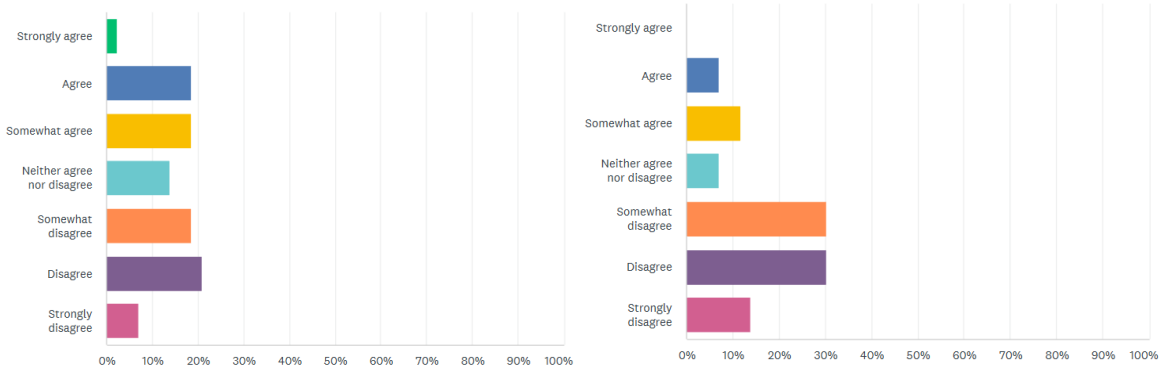

Figure 25. HMH (Q34), Understaffed (Q36)

6.6 Safety Management Systems & Effectiveness of M&M meeting

This section measures the compliance on Safety Management Systems in the HEDs. At Q38 “All the appropriated protocols are established and in use for my job.”, 39.5% AGREE, 51,2% DISAGREE, and 9,3% neither agree nor disagree, Fig. 26. This can be explained by the interviews that some hospitals have already developed all the appropriate protocols and some others are in progress of development. The fact that nobody has answer that he/she strongly agree means that probably there are some additional protocols should be developed, even for the hospitals that have concluded their development. This relates to Q39 “All the protocols in use have major impact in patients’ health.”, where 9.3% DISAGREE, Fig. 26.

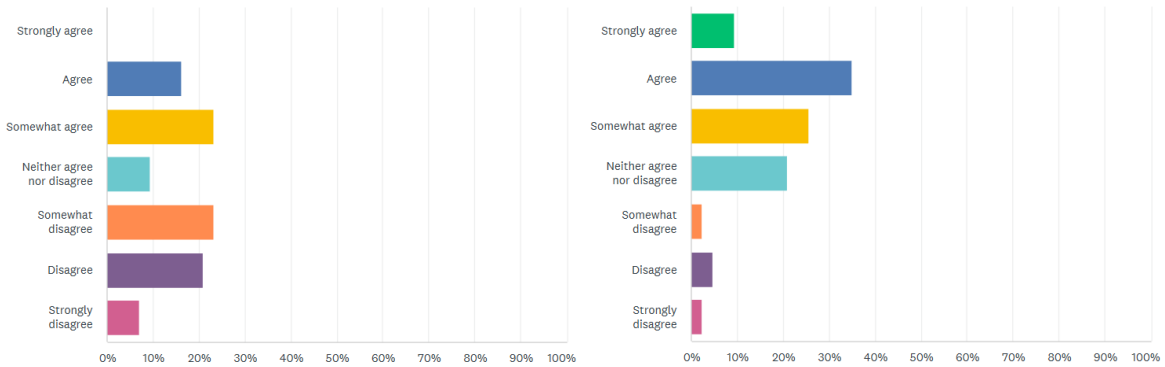

Figure 26. Use of protocol (Q38), Protocols' effectiveness (Q39)

At Q40 “The hospital I am working at, has emergency plans (heart attack, fire, missing child, etc.), has trained the appropriate involved personnel, and has communicated the plans to the staff.”, 38% DISAGREE, Fig. 27, and that relates to

some directors' interviews that their hospital does not have established and/or communicated emergency plans, or even the ED of one hospital, is in the basement and does not have a second emergency door.

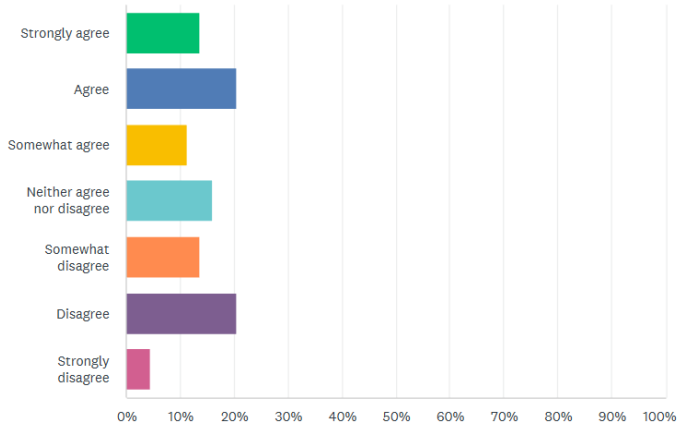

Figure 27. Hospitals' Emergency Plans (Q40)

At Q42 "Do you have a Morbidity &Mortality meeting?" 63,6% of the staff answered that they do not have a morbidity and mortality meeting, Fig. 28. The rest 36,4% replied to the Q43 "How often do you have M&M meeting?" 39% has it every 6 months, 14% has it every 3 months, 35% has it every month, and 10% of the staff has it every week. At Q45 "I freely report any events.", replied 13% DISAGREE, and 53% AGREE. This relates to psychological safety and the learning culture, Fig.28.

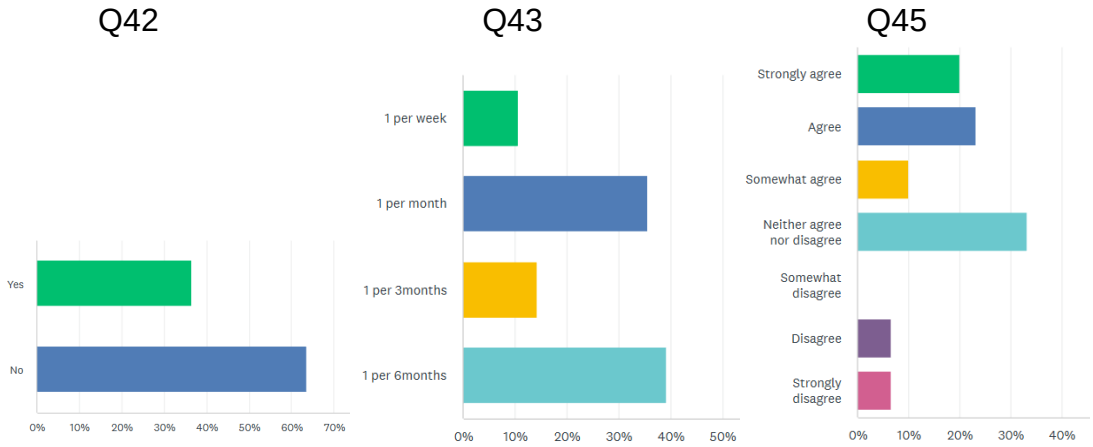

Figure 28. M&M meeting (42), Participation (43), Freely reporting (Q45)

At Q46 "It is useful.", only one person out of 35 disagree, and at Q47 "All the ERs should have such a meeting", replied 42 people and no one disagree, Fig. 29.

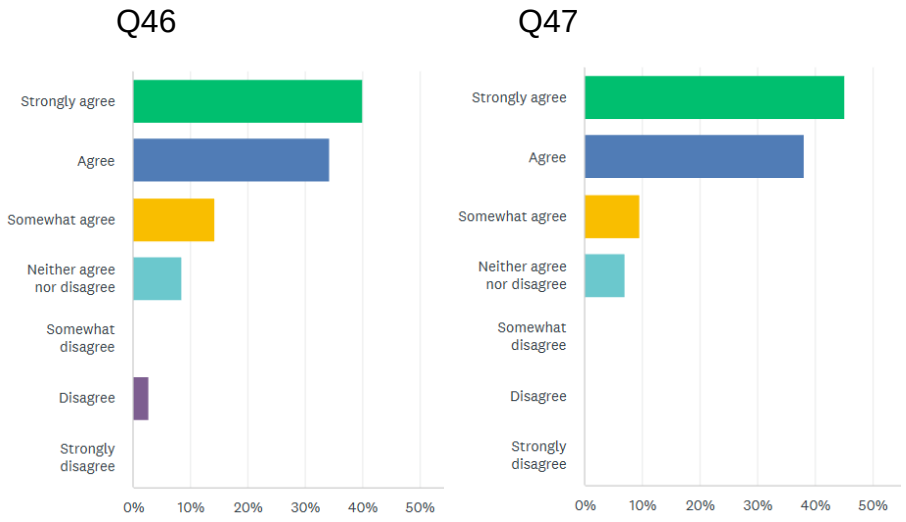

Figure 29. Effectiveness of M&M in ED (Q46) and generally (Q47)

6.7. Working conditions

At Q48 “All the necessary information for diagnostic and therapeutic decisions is routinely available to me.” 18,5% DISAGREE, Fig. 30. At Q49 “All the necessary material and equipment for diagnostic and therapeutic decisions is routinely available to me.”, 21% of the staff DISAGREE. This correlates with some directors’ input, that they do not have a steady provision of disposal material.

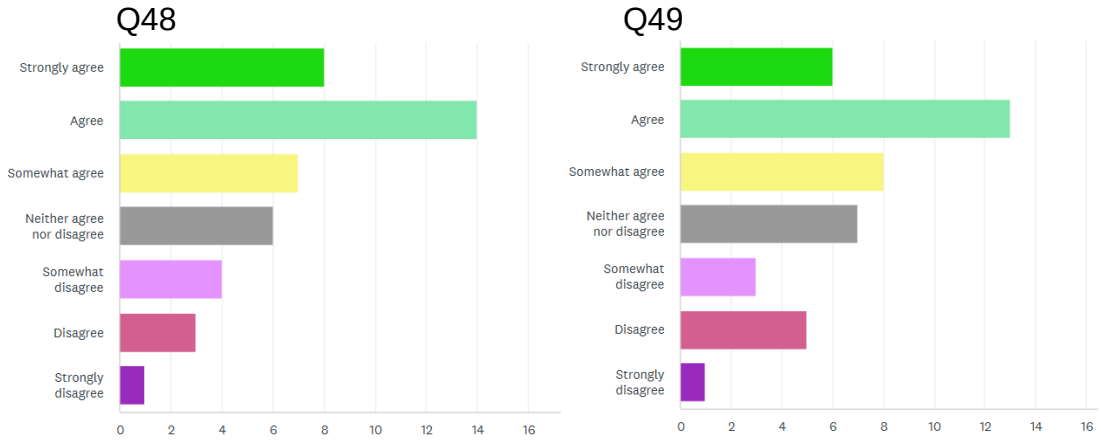

Figure 30. Dispositioned information (Q48) & materials (Q49)

6.8. Factors of Leadership

6.8.1. Type of Leadership’s Relationship / Psychological safety

This section investigates the intimacy between the director and the employees of the ED, and the psychological safety he/she creates. At Q51 “I prefer to have intimacy with the head ED and not formality.”, only 1 employee disagrees. At Q52 “I

have intimacy with the head of ED.", only 2 employees DISAGREE out of the 44 replies.

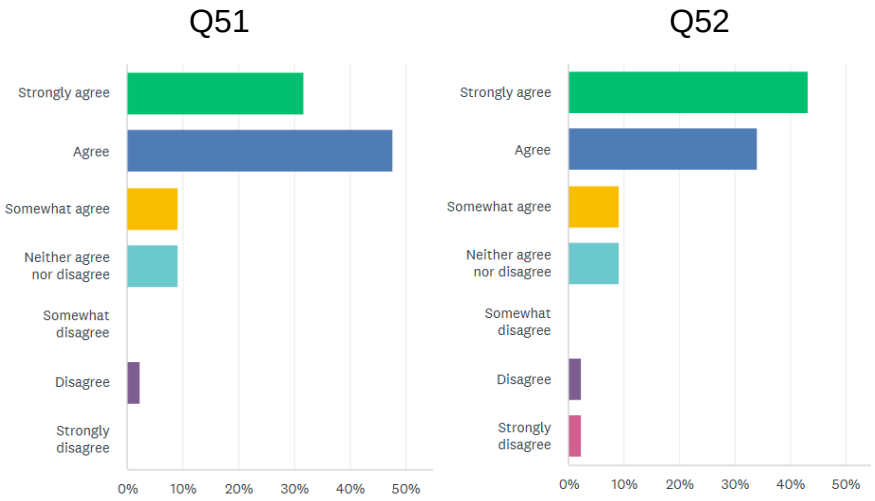

Figure 31. Intimacy (Q51), (Q52)

The psychological safety is measured in Q53 "I trust the head of ED.", where only 2 people DISAGREE, Fig.32. At Q54 "The head of ED listens and takes seriously employees' complains.", 3 people DISAGREE, and at Q55 "I feel safe to report my mistake to the head of ED.", 4 people DISAGREE.

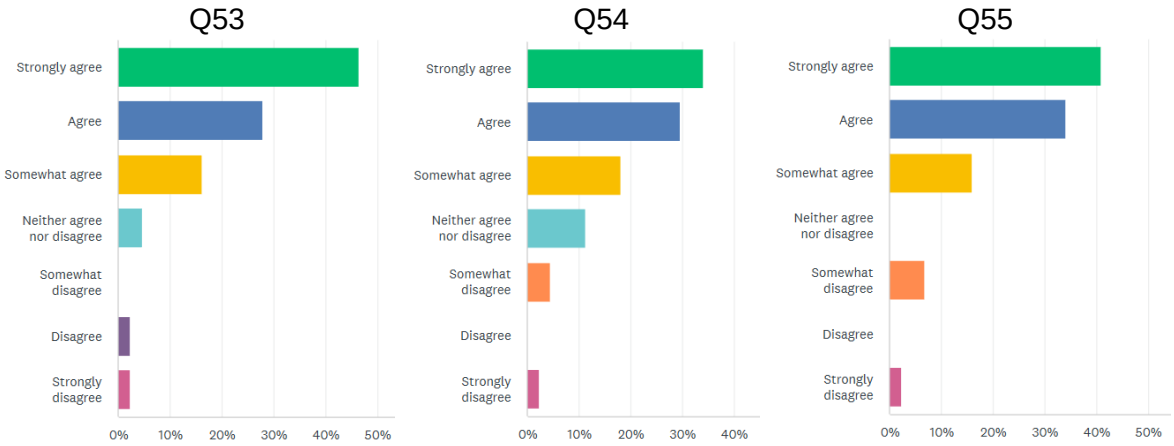

Figure 32. Trust (Q53), (Q54), (Q55)

As a result, intimacy relates with psychological safety which relates to trust and these three conditions occur in HEDs.

6.8.2. Factors for success in ED

Q56 estimates the important factors for success in EDs.

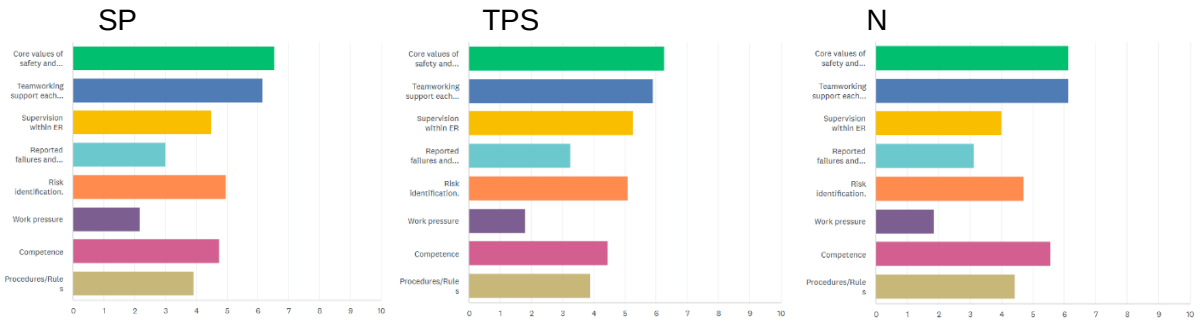

Figure 33. Rating factors for a successful ED for the 3 groups (Q56)

	Specialized Physicians	Trainees in Specialism	Nurses
1	Core value safety	Core value safety	Core value safety
2	Teamworking	Teamworking	Teamworking
3	Risk identification	Supervision	Competence
4	Competence	Risk identification	Risk identification
5	Supervision	Competence	Procedures
6	Procedures	Procedures	Supervision
7	Reported failures	Reported failures	Reported failures
8	Workload	Workload	Workload

Table 2. . Rating factors for a successful ED for the 3 groups

As it is shown in Fig.56 & Table 2, all of them have chosen first the core value of safety and second the teamworking. The third factor shows the strengths and weaknesses of each group. For the SP who have the longest experience and deepest knowledge, and they are responsible for triage system, the risk identification is important. For the TPS, who need supervision and they are not confident about their decisions, supervision is the most important. For the N, who the most experienced ones are permitted to work in the ED, competence is the most important factor.

The 2 least important factors are the reported failures and the workload, because even only one patient will be in the ED during the entire shift, if the previous factors will not eventuate, failure will be occurred. The procedures are rated sixth over the eight factors and this complies with Professor Hollnagel about improving resilience, in Safety-II, through flexible procedures, providing different options and adaptation (Hollnagel E. , 2017). Learning from previous failures is a Safety-I approach and even though a lot of research has been done in Safety-I in healthcare, the medical staff is learning every day through the good practices, otherwise it would have yielded many deaths for each one's education and training.

6.8.3 Values

Q57 shows that the most important personal quality for a director in ED is integrity. SP and N, that they are the most experienced groups, have chosen first integrity and second ability Fig.34. TPS which is the group with the least experience

has chosen first ability and second integrity. All groups have chosen benevolence as the last one.

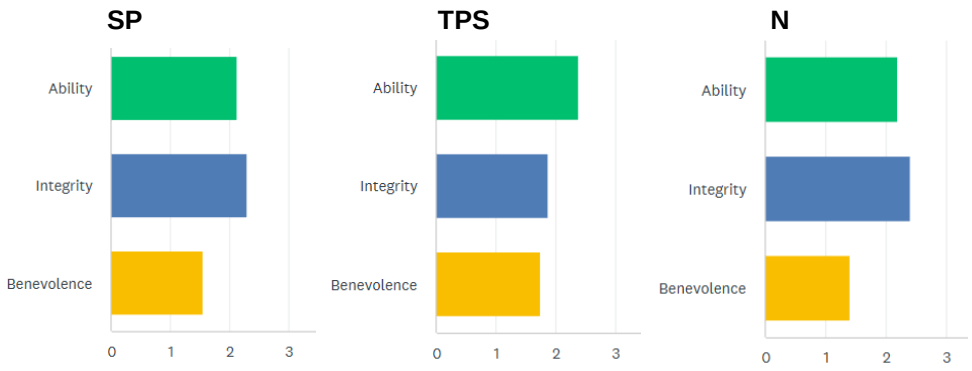

Figure 34. Rating values for a director in ED (57)

It is undoubtable that the ED's director would have the required knowledge and ability for this position, so Q58 includes only personality's qualities that do not relate to knowledge. Again, the experienced groups SP & N, have the same value, which is consistency, Fig.35, Table 3.

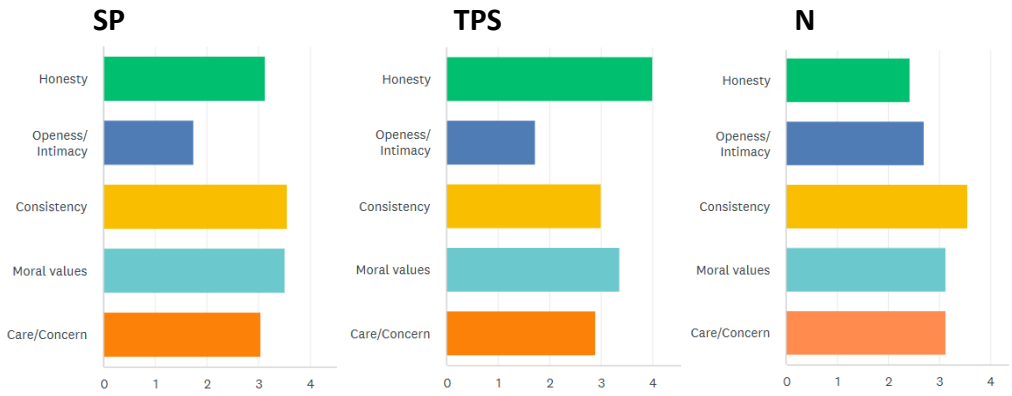

Figure 35. Values in Leadership (Q58)

	Specialized physician	Trainee PS	Nurse
1	Consistency	Honesty	Consistency
2	Moral values	Moral values	Moral values, Care/Concern
3	Honesty	Consistency	
4	Care/Concern	Care/Concern	Openness
5	Openness	Openness	Honesty

Table 3. Values in Leadership

For TPS, the most important value is honesty. Second important value is the moral values for all the participants. The least important for all physicians is openness and for nurses is honesty.

6.9. Quality of Service

At Q17 “I would feel safe being treated here as a patient.” 2SP, 5TPS, 5N, total 12 people DISAGREE, and 32 AGREE, which means that more than ¾ of the staff believe that the service they are offering is quite good. Q59 “Rate the quality of service this ED offers.” In both questions it can be seen that the most confident group is the specialized physicians Fig. 36. The average rate for the quality of the service is 7,11 out of 10.

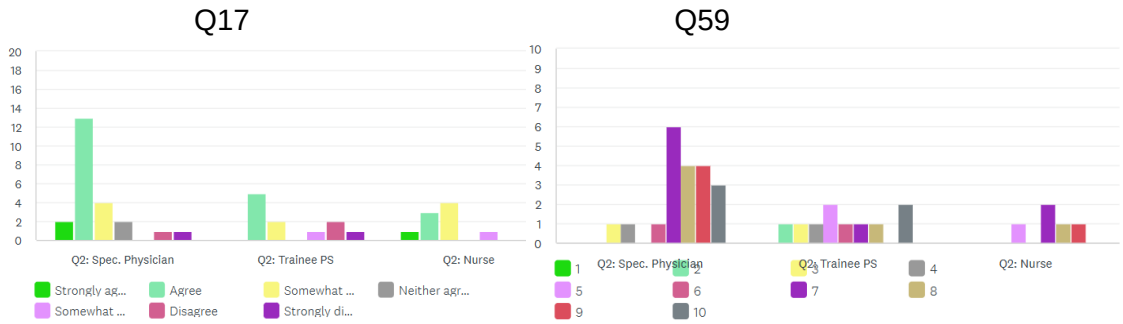

Figure 36. Quality of Service (Q17), (Q59)

7. DISCUSSION

A recent study in leadership morality and occupational safety in high-risk occupations, showed that leaders' morality can affect employees' safety compliance and outcome, and their social behavior (Cavazotte, 2021). Committed, responsible leaders whose actions are based on selflessness, honesty, transparency and justice, proxy authentic leadership (Avolio, 2005). The survey of this study shows that the EDs' staff believe that the most important value for an ED director is integrity, rating ability as the second one and last one benevolence. Taking for granted the ability of a director, another question was given for rating, with five values: honesty, openness/intimacy, consistency, moral values, care/concern. The results shows that consistency and moral values are the first two. Especially the moral values were rated as the second important by all the participant groups.

7.1. Training & Communication

According to Frese, active learning is more efficient than passive learning (Frese, 1994). Passive learning is when the student has the least participation in the process and this could be achieved by watching presentations of lectures, videos and reading pamphlets. Moderated engaging learning is when the student gets feedback of his/her mistakes (on a test), or through computer based programmed, where the correct answer is given as a result. According to Holman a dialogical approach in skill learning and skilled learning it is an active learning approach and improves thinking and comprehension (Holman, 2000). In health and safety learning it develops strategies of actions for different scenarios so the trainees could develop a correct strategy during unforeseen events (Burke, 2006). The active learning, developing knowledge in stages is based on behavioral modeling (Anderson, 1985). In healthcare the medical staff learns actively through the everyday good practices (Safety-II approach), and also through their mistakes (Safety-I approach).

The Morbidity and Mortality meeting in ED is active learning analyzing a personal experience through an open discussion, trying to find what went wrong. Using a backward approach, knowing that the result was not the desirable, the physicians through brainstorming, try to identify the risks, what went wrong through the applied process, and how could be prevented the result. A constructive dialogue in an actual, or virtual context strengthen quality of reflection for decision making (Holman, 2000). Applying causality on a condition for a specific event and deriving a specific action by a trainee, is the proof that the supplied training has been comprehended and that the trainee could build strategies. This will give the opportunity to the trainee to develop self-monitoring and self-efficacy processes, improving behavioral safety performance and handle safely unforeseen situations (Burke, 2006). The medical staff has a long and demanding training, which requires dedication and commitment, which leads to constant personal development, with no tolerance to unsafe acts. This is proved by Q10 in the survey, where the trainees expect better supervision and better training

from the hospitals (Q50). Buke had reviewed 19 journals of occupational safety training, which yield to 709 studies, comparing them in relation to safety knowledge (self-rating, or test), safety performance (self-rating, or by a supervisor, or a colleague) and health and safety outcome (no of accidents, injuries, illnesses). As the training was more engaging, then knowledge acquisition was increased, and the negative safety outcomes were reduced.

The physician who steps out and admittees his/her mistake, despite the danger of legal consequences, has a secure attachment profile, seeking for constructive feedback in a psychological safe environment (London, 2023). This means that he/she feels psychological safe within the team and offers the learning benefits of the discussion to the team. Some directors of ED mentioned that the physicians approach him privately to confess such a confidential information, which means that they trust their director or their supervisor, but not the team yet, and for the time being they have an anxious attachment style to the team (London, 2023). The leader who encourages people to speak out their mistakes has a secure attachment style and has a positive connection with the team member, based on mutual caring and respect (London, 2023). As the time passes by, the ED's directors with a secure style could enhance and assure the spirit of confidentiality and make the anxious members, less anxious or secure to report their mistakes within the team (London, 2023). Regulation could probably help, but it is also difficult due to ethical issues, defining the limits of keeping the confidentiality for the sake of knowledge.

The ED's director who has managed to convince his team about the confidentiality and has built trust within the team, he has established a monthly M&M meeting where the topics and the results are submitted on a written report to the hospital's committee. This means that he has created a secure – secure attachment style within his team, a psychological safe environment. From the survey can be concluded that despite the profound psychological safety (Q6) and the directors' encouragement to the staff for pointing out any issues of patient safety (Q15), there are some barriers of discussing the errors (Q18), especially for the TPS. Compering (Q18) and (Q55), 11 people out of 44 have difficulty to discuss errors in the department, but only 3 people do not feel safe to discuss their errors with their director. This means that the communication channels between the directors and their staff are open both ways, trusting each other. The (Q54) proves that the directors are good and active listeners, because only 3 people disagree. The (Q53) proves that the ED staff trust their directors, because only 2 people disagree. As a result of the above comparisons psychological safety relates to communication and learning.

The safety management in an organization has to provide not only the technical education which relates to safety, but psychological education as well. The psychological education affects to the employees' conscientious, awareness, responsibility, innovation, self-knowledge, self-control, recognition of stress factors, and reaction to unsafe acts. Customized training according to the employee's

psychology is even more efficient, but it should be conjunct with low criticism, because training behavior is a slow process (Liu, 2012). The psychological quality can be improved through improving the personality, by physical exercise, cultural entertainment, style cultivation. Transforming the employees' psychological state, they can be adaptable to new ideas, values and attitudes. The survey shows the oxymoron that the employees have safety and moral values as their core values, but the management of the hospitals does not do much about to reduce employees' stress and reduce patient safety risk. Additionally, some trainees believe that the hospital's do not do much about their training, in the daily basis (Q50), in the contrast to ED directors how had a better rating (Q11). This means that although the directors want fast operations and productivity due to the vast workload, their goal is accuracy, and this can only be achieved by training and teamworking.

The duration of training is an issue and could affect the implementation of training. Research on coaches implementing the training they had on anterior cruciate ligament injury prevention (ACLIP), on their athletes, showed that it depends on the duration of the training. The coaches believed that if the athletes practice ACLIP program for less than five minutes at every practice, the training is not effective, and if they are have to practice it for more than thirty minutes, the coaches are not willing to implement it (Frank, 2015). In other words, if ACLIP program takes more than one fourth of the training session is not worth it, because it will take time from training other muscles in order to improve their performance. Admitting and wisely taking risk is the reasonable solution. Eliminating the risk of having an ACL injury can be only if the athlete is not playing at all. In the Hellenic Health System this is not an issue. The health training in medical staff is the longest in Europe, as it is 6 years in medical school, 2 years practicing in a clinic in order to get the approval for practicing, 4-6 years specialism and 2 years the emergency medicine training.

7.2. Compering Construction and Health Care

Construction is a complex system like the healthcare, due to many interactions and variety of demand (Hollnagel E. , 2017). Accidents or injuries usually occurred in a construction site when two conditions occur simultaneously, unsafe working environment and unsafe behaviors. (Lee, 2021). Heninrich's research over 75000 industrial accidents, back in '50s, showed that the 88% were caused by human error (Heinrich H. P., 1950). Even in these days, the 80% of the accidents in construction sites are due to workers' unsafe behavior (Li, 2015). Most of the research focused on the safety compliance. Leadership in health and safety often uses penalties, and through punishment, expect workers behavioral change (Choi, 2017). In healthcare the worst case of a penalty could be a court prosecution.

Ye had demonstrated an agent-based model in order to understand the sociocognitive process of construction workers' unsafe behaviors (Ye, 2020). In modeling had been considered individual cognitive factors and organizational factors which influence unsafe behaviors. The individual cognitive factors are the safety

awareness, experience, safety knowledge, safety attitude and the perceived safety norms. All these factors have been measured in this study's survey and all of them have high scores. Physiological and psychological stress factors like fatigue for example, have not be considered at all, and they are mentioned as the limitations of Ye's study. This research includes a stress factor screening due to the vast variety of stress factors, their severity, and their frequency.

Ye's organizational factors are the safety communication within the organization, the safety training and the social groups. The results of this research showed that the interaction between the managers, and especially the foremen, who have a demonstrative role, with the workers, reduced unsafe behaviors. A proposed practice for the practitioners is when there is a deviation in risk understanding, safety training and safety communication are the treatments which reduce the deviation and as a result will reduce the unsafe behaviors. There are also promoted the reward and penalties in wages, because of the behavior feedback. This type of management is widely accepted in Asian countries, but in Western countries is characterized as "old-fashioned", because it could cause a blame culture in the organization (Dekker S. , 2016).

The organizational factors in this study relate to the political decisions which influence top management decisions and lead the medical staff to work in a stressful environment, and the personnel perceives it and is alert, because of their personal values. The organizational factors that relate to the middle management level, which is the directors' safety leadership, have been measured and the scores illustrate a profound safety culture and awareness. Their evenhanded coaching leadership, provides the daily organizational facilitation and psychological support, creates a psychological safe team. Because of their leadership and the medical training, the EDs operate under a strong teamworking spirit, and team bonding, which enhance resilience in crisis. These are the major differences with the construction industry, which employs personnel for a certain period, till the completion of the project, which is not a sufficient time for creating team bonding. Additionally, the personnel's screening for the selection is not as strict as for the medical staff.

7.3. Monitoring and Coaching

Monitoring is part of the transactional leadership (Bass B. A., 1994). It is the precondition for improving safety performance, as in order to improve any variable like quality, delivery time, wasted material, or accidents, the variable should be recorded for a sufficient time in order to determine its distribution, which describes the current situation of the variable. The recording should thoroughly continue ever after starting, for monitoring any sudden change of values, or the change after the managerial treatments for improvement. If the data is enriched with details about the conditions (who was operating that job, the used material and tools, the suppliers, the

environmental conditions, etc.), it could provide valuable information during a Route-Cause Analysis. In coaching sports, monitoring is also the precondition for improving the athletes' performance, but it also helps the athletes to monitor their own performance, set their goals and improve themselves. This means that monitoring improves awareness, self-knowledge, self-control, and responsibility of athletes and employees. The most important role of a coach in sports or in safety performance is to set realistic short-term and long-term goals in discussion and collaboration with the athlete or the employee, in order to be achievable, and facilitate him/her to achieve them. Achieving a goal improves positive psychology and commitment, which stimulates dedication on the goal, and as a result it enhances the rate of improvement in awareness, self-knowledge, self-control and responsibility.

According to cognition behavioral theory people act according to their values, goals, knowledge and focus of attention (Cooper D. , 2000). The core values for the medical staff are safety, consistency, and morality. Their knowledge is under continues development, with passive and active learning, formal and informal training and supervision. Loosing their focus of attention could occur due to stress that is analyzed in Chapter 5, and this could cause a mistake.

Obviously, the mistake is stigmatized and unacceptable, due to the psychological symmetry of effect is the accident, which is a bad thing, with the cause which is the mistake, and it is a bad thing as well, as due to causality, if there is an effect, there is a cause and vice versa. Especially the medical staff, because they have trained skills and values to help and care patients and according to Hippocrates' oath, they should not harm the patients, they feel guilty if they made a mistake, and they have to live with it.

The psychological pressure for perfectionism, could collapse them so they need a mentor who will remind them that they are humans, although they hold patients' lives in their hands, and point that mistake as a lesson of how the team will strengthen its skills managing the stress factors. Working as a team mitigates the possibility of a mistake because of the dynamic adjustments. We don't bump into each other because we make dynamic adjustments according to the others motion. This also occurs when a team is playing, every player adjusts his/her motions in order to collaborate and his/her team perform a score, according to the coach's directions. An interruption or losing attention could have hazardous consequences. Working in a team mitigates the risk of losing attention for long time. This is well-known in EDs' staff, because they rated teamworking as the second factor for ED's success, after the core value of safety.

In coaching leadership, the coach designs the required skills and knowledge for the team and the individuals including the monitoring, evaluation, and feedback process, in a psychological safe environment. The survey shows that EDs' directors have built a psychological safe environment, and the staff feel safe to discuss mistakes with them, seeking and receiving constructive feedback. In order the coach to be able

to communicate effectively his/her plan should enhance his emotional intelligence (Grant, 2013). Medical staff are trained to understand human feelings and they care about them. During interviews all the directors mentioned that they are discussing with their staff their psychological pressure and try to find solutions, which sometimes put additional workload on their solders. Having a caring leader, supervisor, director in any job, is a positive role, which influences behaviors (Heslin P. A., 2006). Openness and conflict management ensure psychological safety and coach-athlete relationship quality, as well as foster athletes' commitment and cooperation with their coach (Jowett, 2023). Due to that attachment style between the directors and their teams, as well as, within the teams, the staff prefers to work in the particular ED than anywhere else (other clinic, or other hospital), despite the vast workload. This means that the EDs' staff is dedicated and committed to their job.

8. PROPOSALS – FUNCTIONALIST and INTERPRETATIVE APPROACH

A combination of a functionalist approach, from top to down from the author, and an interpretative approach, from middle to the top, from the directors, for inventions in the EDs is described below. These inventions should had been proposed and applied by the top management of hospitals, under the commitment, facilitation, and auspices of the Hellenic Ministry of Health (HMH). The director's proposals are characterized as interpretative approach, but they have been ignored by the top management and the HMH, posing additional risk in patients' safety.

8.1. Directors' Proposal

During interviews all directors had mentioned the political decisions should be taken in order to improve the health service in EDs in Greece and assure patient's safety. First of all, enhancing the primary health system is mandatory, in order to avoid visits in ED of patients who do not need an emergency treatment. This will decrease the number of patients in the EDs, and the personnel might be sufficient. A statistical analysis is mandatory for estimating the appropriate number of medical staff in EDs, which will consider the population of the region, the additional number of tourists, the number of hospitals in the region and the emergencies in the last decade. Increasing the frequency of hospitals' emergency duty in large-populated areas like Athens, will reduce the number of emergencies per hospital. Increasing the quality of service, it would be better if all the hospitals offer emergency duty every day, so the crucial transfer time of the patient would significantly decrease. This would decrease the total mortality rate in Greece, as most patients' deaths occur during their long transfer.

Another mandatory invention is a generous increase of medical staff's salary. Especially the physicians, whose education is more than ten up to fourteen years, free of charge in the Greek universities, should receive a competitive salary, in comparison to other EU countries, in order to continue be engaged in the Greek National Health System and do not work for private hospitals, or even worst, migrate to another country. The brain-drain rate in the last decade, due to economic crisis, is the biggest threat for Greek economy and the Greek population. Three percent of the population migrated between 2010 and 2013. Ninety percent of the migrants were higher educated, and sixty-four percent were post-graduated. This human capital generates €12.9 billion in GDP, and €9.1 billion in taxes for the hostess countries, while Greece had spent €8 billion to educate them (Stamouli, 2020). From 2008 to 2017 four hundred seventy thousand educated people have migrated (HFE, 2018). In the last decade twenty thousand physicians have left Greece. According to ED directors' input, the migrant's net salary is more than the quadruple Greek net salary for physicians.

Another essential invention, mentioned by most of directors, is the

establishment of a unified digitalized health recording system. The use of such a system will save a lot of interviewing time when the patient enters the ED, and it is crucial when the patient is unconscious, or cannot answer the medical staff's questions, as his/her digitalized life health record could be accessed immediately by the medical staff. Additionally, it would assure non missing information at a patient's transfer to another hospital.

8.2. Patient's Health Record

Missing information within the hospital or during a transfer to another hospital, as well as not well reported creates tension within the working teams, especially at the shift change, and increase risk in patient's safety (Redley, 2017), (Turner, 2021). A digital bracelet on the patient's hand, could be useful, as it could be scanned by the medical staff and upload on it all the medical records and voice recordings with descriptions, which is faster than typing the description. Additionally, sound descriptions would give the opportunity to the medical staff to operate while getting the information, instead of stopping their action while reading. All the digital health record could be accessible by any consultant in the hospital simultaneously, in order to reduce time of decision making.

8.3. Patients' Awareness

As we see on Fig.&&& awareness relates to the initial information and the patients does not know anything about the medical procedures and their time consumption. Speaking on personal experience, most of patients we do not know about medical procedures and the required protocols. Additionally, patients' perception about the severity of an emergency relates to a stressful, running reaction of the medical staff. If they see that everything run smoothly, they perceive it as that the medical staff is not facing any emergency and neglects them, so they complain. A stressful reaction by the medical staff, always creates stress and fair to the run patient about the severity of his situation, as well as to the waiting patients and they think that only these cases can be selected before them during the triage. People who do not have any previous experience in an emergency room do not know what to expect. Additionally, many patients, because they do not know the other patients' situation, they think that their situation is the most sever one and if they are waiting because they are neglected. So, they are waiting to be treated in fear and stress. Due to the fact that the majority of the patients visiting a Greek ED, should not need it, and could have been treated by the primary health system, have the strength to have a serious argument with the medical staff for their delayed treatment. A study in the Netherlands showed that informed patients that student nurses would be present during their treatment, because it is required for their studies, they felt safer about their treatment (Van der Schaaf, 2023). This study showed that although the information was irrelevant with the patients' disease, it helped building up an attachment which requires time to communicate and empathy, and that increased the patients' perception about

nurses' accountability. Another research in older adults' perceptions of feeling safe in an intensive care unit showed that nurses' proximity, monitoring and oversight, influenced their feeling of safety (Lasiter, 2011). Projecting these results to the Greek ED, if patients were informed about the triage system, the required time for their medical test, and the importance of following the protocols, they would trust it and feel safer. A video spot and posters in the waiting area and in the wards of the ED, would give the required information to understand that they are not neglected by the medical staff, but in the contrary, the medical staff complies with the international standards for patients' safety. The language of these spots should be informal and simple, without any medical terminology. The message should make clear that every second counts in ED and interrupting ED's staff, decreases their actual working time in treatment Additionally, destructing their concentration in multitasking operations, poses additional risk on patients' safety. The patients' awareness might decrease the number of patients visiting the ED without an urgent need, deciding to visit first a general practitioner in primary health system.

8.4. EDs' Staff Awareness

In conjunction with the patients' awareness program, staff's awareness program should be established, because the possibility of patients' misbehavior could be mitigated but not eliminated. Additionally, there is a variety of misbehaviors that could be escalated to violence, especially when the person is under drugs, or alcohol influence. A behavioral training for risk identification and handling should be established for the employees in EDs. All the employees should be able to spot behavioral signs, such as anxiety, mumbling, etc, before the situation is escalated. Then, a team which would be responsible for handling these situations, should be established, including security staff, a nurse and a trainee physician, who would be involved only in escalated cases. The team could spot the people with anxiety and approach them before they lose their temper. Staff's behavior should be very calm, caring, and explicatory, referring to the posters and videos for the triage system and the use of protocols.

9. CONCLUSION

This study's aim was to improve the patients' safety and the quality service in HEDs and project the good practices on other industries. It has answered all the research questions, and achieved the objectives, by following a hybrid approach of the Safety-II, focusing on *what goes* well, and the Safety Differently: examining and understanding a) the everyday work, b) the supervision, c) top management & commitment, d) measurement, e) blame culture, f) psychological safety. Beyond that, it has been investigated the core values and best practices for a successful leadership in healthcare and projecting this in construction industry.

The results from ten interviews with ED's directors and a survey, which was released to EDs' staff, and measured the safety culture can picture EDs facing a crisis every day, due to excessive workload and understaffing. Despite the passive governance of the Hellenic Ministry of Health, and the passive leadership of hospitals' top management, the safety culture and awareness are characterized really good. The main reason for this success, under difficult circumstances, is because the medical and nursing staff have safety as a core value, and patients' safety is an ethical responsibility. The second important factor for ED's success is teamworking, which has created resilient team, with good bonding, which operates in a psychological safe environment. All teams within each ED, are supervised by senior specialized physicians which reinforces psychological safety and resilience, within the team. These, in conjunction with intimacy and good manners could explain why the staff prefers to work in the ED than anywhere else (other clinic, or other hospital), despite the vast workload.

Psychological safety has been created by the directors, practicing consistently coaching leadership, with open communication channels and intimacy, which built trust. Ninety-three present of the EDs' medical and nursing staff trust their directors and they could discuss freely their mistakes with their directors, seeking constructive feedback. This means that there is no blame culture, in the contrary, there is a strong learning culture for continuous development, enhancing patients' safety. The human-relation type of attachment between directors and employees reinforces commitment and dedication of the team, in order to withstand the excessive workload. During interviews all the directors mentioned that they are discussing with their staff their psychological pressure and try to find solutions, which sometimes put additional workload on their solders. These leaded two directors to physical collapse, and finally they resigned. These incidents were the motive of finding solutions that could mitigate medical staff's stress and consequently mitigate the risk of patients' safety.

Apart the obvious solutions that relates to political decisions, which includes a) reinforcing the primary healthcare, b) hiring medical, nursing and supportive staff and c) reorganizing the rotation of the emergency duties, there are proposed two applications for awareness. One is about the patients' / relatives' awareness, via risk communication about the triage system and the time-consuming medical procedures, in order to reduce complains and violent events. Another application is the training for the staff's awareness, predicting, preventing, and dealing with violent attitudes. It is

unacceptable the fact that someone goes to work to help and save people, and somebody attacks him/her inside his/her working environment.

All the above-mentioned good practices could be applied in construction industry, in three conditions. Firstly, the selection screening in hiring should have the filter of the safety value for all the employees and all the managerial levels. Secondly, the hired staff should be hired for a longer period than the duration of a project, in order to have the time to create human-relation attachment, which enhance commitment. And the third condition is coaching leadership to be performed by a caring, charismatic leader. The main characteristics that a safety leader should have, according to ED's staff, are integrity and ability. Having for granted the ability, due to the excessive education, training and working experience, the best rated personal qualities for an ED director, according to the ED's staff, are consistency and moral values. Having a caring leader, supervisor, director in any job, is a positive role, which influences behaviors.

References

Anderson, J. (1985). *Cognitive Psychology and Its Implications .* New York : Freeman.

Avolio, B. J. (2005). Authentic leadership develpment: Getting to the root of positive forms of leadrship. *The Leadership Quarterly*, (16), 315-338.

Barling, J. L. (2002). Development and test of a model linking safety specific transformational leadership and occupational safety. *Journal of Applied Psychology.*

Bass, B. (1985). *Leadership and performance beyond expectations.* New York: Free Press.

Bass, B. A. (1994). Improving Organizational Effectiveness Through Transformational Leadership.

Burke, M. S.-C. (2006, Feb). Relative Effectiveness of Worker Safety and Health Training Methods. *American Journal of Public Health*.

Cavazotte, F. M. (2021). Authentic leadership and sustainable operations: How leader morality and selflessness can foster frontline safety performance. *Journal of Clear Production*.

Choi, B. L. (2017). An empirical based agent-based model of the sociocognitive process of construction worker's safety behavior. *Journal of Construction Engineering and Management*.

Colley, S. L. (2013). An examination of the relationship amongst profiles of percaived organizational values, safety climate and safety outcomes. *Safety Science*, 69-76.

Commission, E. (2023). *Research and innovation*. Retrieved from EC: https://research-and-innovation.ec.europa.eu/research-area/industrial-research-and-innovation/industry-50_en

Conchie, S. T. (2011). Trust and distrust in safety leadership: Mirror reflections? . *Safety Science*, (49) 1208-1214.

Cooper, D. (2000). Towards a Model of Safety Culture. *Safety Science*, (36) 111-136.

Cooper, D. (2000). Towards a Model of Safety Culture. *Safety Science*, (36), 111-136.

Cooper, D. (2002). Human Factors in Accidents. Revitalizing Health and Safety – Achieving the Hard Target. *Institute of Quarrying*.

Cooper, D. (2016). *Navigating the safety culture construct: a review of the evidence.* Retrieved from BSMS: http://behavioural-safety.com/articles/safety_culture_review.pdf

Cooper, M. D. (2004). Exploratory analysis of the safety climate and safety behavior relationship. *Journal of Safety Research*, 497-512.

Cooper, M. D. (2019). The efficacy of industrial safety science constructs for addressing serious injuries & fatalities . *Safety Science*, 164-178.

Cooper, M. R. (2016). Implementing High Reliability for Patient Safety. *Journal of Nursing Regulation*, 46-52.

Cruz M., P. M. (2008). Total Quality Management and Operational Risk in the Service Industries. *INFORMS Tutorials in Operations Research*.

DeCamp, W. , Herskovitz, K. (2015). *The Theories of Accident Causation.* Western Michigan University.

DeCamp, W. H. (2015). The Theories of Accident Causation. Western Michigan University.

Dekker, S. (2006). *The Field Guide to Understanding 'Human Error'.* Ashigate.

Dekker, S. (2016). *Just Culture Restoring Trust and Accountability in your Organization.* CRC Press.

Ede, J. W. (2019). How human factors affect escalation of care: a protocol for a qualitative evidence synthesis of studies. *B<J Open*.

Endsley M. (1995). Toward a Theory of Situation Awareness in Dynamic Systems. *Human Factors: The Journal of the Human Factors and Ergonomics Society*.

Endsley, M. (1995). Towards a Theory of Situation Awareness in Dynamic Systems. *Human Factors*.

Frank, B. S.-M. (2015). High levels of coach intent to integrate a ACL injury prevention program into training does not translate to effective implementation. *Journal of Science and Medicine in Sport*, (18) 400-406.

Frese, M. Z. (1994). Action as the core of work psychology: a German approach. In H. Triandis, *Handbook of Industrial and Organizational Psychology* (pp. 271-340). California: Palo Alto.

Fugas, C. S. (2011). The "is" and the "ought": How do perceived social norms influence safety behaviors at work? . *Journal of Occupational Health Psychology* .

Gallagher, C. U. (2003). Occupational safety and health management systems in Australia: Barriers to successOccupational safety and health management systems in Australia: Barriers to success. *Policy and Practice in Health and Safety*.

Glendon, I. (2006). *Human Safety and Risk Management.*

Glendon, I. C. (2006). Human Safety and Risk Management.

Grant, A. H. (2013). Developing the leader as coach: insights, strategies and tips for embedding coaching skills inthe workplace. *Coaching: An International Journal of Theory, Research and Practice.*, (6) 102-115.

Green C., H. A. (2011). *The Trusted Advisor Fieldbook : A Comprehensive Toolkit fot Leading with Trust.*

Guldenmund, F. W. (2000). The nature of safety culture: a review of theory and research. *Safety Science* , 215-257.

Heinrich, H. P. (1950). *Industial Accident Prevention.* New York: McGraw-Hill.

Heinrich, H. W. (1931). *Industrial accident prevention: A scientific approach.* New York: McGraw-Hill.

Heslin, P. A. (2004). The effect of upward feedback on managerial behavior. *Applied Psychology* , (53) 23-37.

Heslin, P. A. (2006). Keen to help? Managers' implicit person theories and their subsequent employee coaching. . *Personal Psychology* , (59) 871-902.

HFE. (2018). *Brain Drain* . Retrieved from Hellenic Federation of Enterprises: https://www.sev.org.gr/Uploads/Documents/Brain_Drain_executive_summary.pdf

Holman, D. A. (2000). A dialogical approach to skill and skilled activity. *Human Relations*.

Jones, R. A. (2005). The impact of organizational culture and reshaping capabilities on change implementation success: the mediating role of readiness for change. *Journal of Management Studies*, 361-386.

Jowett, S. A.-J. (2023). Creating the conditions for psychological safety and its impact on quality coach-athlete relationships. *Psychology of Sport & Exercise* , (65)102363.

Kalisch, B. A. (2010). Interruptions and Multitasking in Nursing Care. *The Joint Commission Journal on Quality and Patient Safety*, Vol(36) 126-132.

Kines, P. L. (2011). Nordic Safety Climate Questionnaire (NOSACQ-50): A new tool for diagnosing occupational safety climate. *International Journal of Industrial Ergonomics*.

Lasiter, S. (2011). Older adults' perceptions of feeling safe in an intensive care unit. *Journal of Advanced Nursing*, (67) 2649-2657.

Lee, G. C. (2021). Assessment of construction workers' perceived risk using physiological data from wearable sensors: A mashine learning approach. *Journal of Building Engineering* .

Li, H. L. (2015). Proactive behavior-based safety management for construction safety improvement. *Safety Science*.

Liu, G. L. (2012). Analysis of the safety psychological factors in the coal mine safety management. *Procedia Engineering*, (45) 253-258.

London, M. V. (2023). Gaining feedback acceptance: Leader-member attachment style and psychological safety. *Human Resource Management Review*.

Manning, M. (2009). The effect of subjective norms on behaviour in the theory of planned behaviour: A meta-analysis. *British Journal of Social Psychology*, 649-705.

Manson, M. (2017). The NCEPOD Method - How the National Confidential Enquiry into Patient Outcome and Death designs and delivers national clinical outcome review programmes. *Journal of Patient Safety and Risk Management* , Vol(23).

Michigan, U. (n.d.). *Transactional vs. Transformational Leadership: What's the Difference?* Retrieved from michiganstateuniversityonline.com.

Neal, A. G. (2000). The impact of organizational climate on safety cli-mate and individual behavior. *Safety Science*.

Parker, R. B. (2000). Organizational culture in the public sector: Evidence from six organizations. . *The International Journal of Public Sector Management* , 125-141.

Peguero-Rodriguez, G. P. (2023). The Experience of Families Accompanying a Senior to the Emergency Department: A Scoping Review. *Journal of Emergency Nursing*.

Probst, T. a. (2010). Accident under-reporting among employees: Testing the. *Accident Analysis and Prevention*.

Reason, J. T. (1993). *Managing the management risk: New approaches to organizational safety. I.* Reliability and Safety in Hazardous Work Systems.

Reber, A. S. (1985). *The Penguin Dictionary of Psychology.* London: Penguin Group.

Redley, B. B. (2017). Interprofessional communication supporting clinical handover in emergency departments: An observation study. *Australasian Emergency Nursing Journal* , Vol (20), 122-130.

Report, H. E. (2005). *A review of safety culture and safety climate literature for the development of the safety culture inspection toolkit.* Health & Safety Executive.

Salmon, P. S. (2008). What really is going on? Review of situation awareness models for individuals and teams. *Theoretical Issues in Ergonomics Science* , Volume 9, 297-323.

Schein, E. H. (1992). *Organizational Culture and Leadership .* San Francisco: Jossey-Bass.

Schindler, P. T. (1993). *The Structure of Interpersonal Trust in the Workplace.* Psychology Reports.

Schwartz, S. (2012). An Overview of the Schwartz Theory of Basic Values. *Online Readings in Psychology and Culture*.

Sneddon, A. M. (2013). Stress, fatigue, situation awareness and safety in offshore drilling crews. *Safety Science*, (56) 80-88.

Spencer, R. C. (2004). Variation in communication loads on clinical staff in the emergency department. *Annals of Emergency Medicine*, Vol(44) 268-273.

Stamouli, N. (2020, Jan 21). *Greece's reverse brain drain.* Retrieved from Politico: https://www.politico.eu/article/greece-reverse-brain-drain-skills-young-people-financial-crisis/

Stanton N., C. P. (2001). Situational awareness and safety. *Safety Science*.

Stanton, N. (2009). Situation awareness: where have we been, wher are we now and where are we going? *Theoretical Issues in Ergonomics Science*, 1-6.

Stanton, N. C. (2001). Situational awareness and safety. *Safety Science*, 189-204.

Turner, J. C. (2021). Frequency of safety net errors in the emergency department: Effect of patient handoffs. *The American Journal of Emergency Medicine*, (42), 188-191.

Van der Schaaf, J. W. (2023). Patients' experiences of safety in a hospital learning department: Aqualitative study. *Journal of Taibah University Medical Sciences* , Vol(18), Pages 436-443.

Vredenburgh, A. (2002). Organizational safety: Which management practices are most ef-fective in reducing employee injury rates? . *Journal of Safety Research*.

Way, S. A. (2002). High performance work systems and intermediate indicators of firm performance within the U.S. small business sector. *Journal of Management*.

Whittingham, R. (2004). *The Blame Machine: Why Human Error Causes Accidents.* London: Routledge.

Wiegmann, D. A. (2002). A Synthesis of Safety Culture and Safety Climate Research. *Aviation Research Lab Institute of Aviation*.

Ye, G. Y. (2020). Understanding the sociocognitive Process of Construction Workers' Unsafe Behaviors: An Agent-Based Modeling Approach. *Environmental Research and Public Health*.

Yule, S. (2002). Do transformational leaders lead safer businesses? *25th International Congress of Applied Psychology.*

Zammuto, R. G. (2000). Managerial ideologies: organizational culture, and the outcomes of innovation: a competing values perspective. In N. W. Ashkanasy, *Organizational Culture and Climate.* (pp. 261-278). CA: Thousand Oaks.

ANNEX A "ED Statistics through interview"

Region Population Area	Hospital	No. Specialized Physicians	No, Trainees + Physicians from Clinics	No. Understaffed Physicians	Understaff %	No. Additional Physicians During Emergency Duty	No. Nurses / required nurses	No. Hours / shift	Hospital on Duty	No patients /shift	No patients /shift / specialized physician	No. patients /shift / physician
Athens 5.280.588 Citizens 3.380Km^2	Attiko Training Center of EM	12	15	5	30%	10	35 / 35	8 or 12	Every 4 days	1000 av	45	27
	Ippokratio	9	0+15	3	25%	5	32 / 32	8 or 12	Every 4 days	400 av	29	14
	Tzanio	8	15+17	7		10			Every 4 days	680 av		
	Kratiko	16	17				8 / 35	8 or 12	Every 4 days	1100av		
	Gennimata	Excluded from the survey due to bureaucracy										
Heraklion 305.017 citizens 2.643 Km^2	University Hospital	8	4+				40 / 42		Every 2 days	600		
	Venizelio	8	0	2	20%	5	30 / 32	8 or 10 or 17	Every 2 days	530 av	41	41
Chania 156.580 Citizens 2.376 Km^2	Chanion	3	0	6	66%		8 / 32		Every day	400 av		
Patra 193.290 Citizens 2.619 Km^2	University Hospital Rio	7	0+12				15 /35		Every 2 days	400 av		
Larissa	University Hospital	6	0+6						Every 2 days	360 av		
	General Hospital	8	0+8	7	46%	2	29 / 32	7 or 12	Every 2 days	300 av		

ANNEX B "INTERVIEW"

Demographics

1. How many physicians are working in your Emergency Department?
2. How many trainee physicians?
3. How many nurses?
4. How many are senior physicians (more than 5 years of experience in ER)?
5. How many are senior nurses (more than 5 years of experience in ER)?
6. Is ED working only with permanent staff, or you have support from other departments during hospital's emergency service?
7. The days that the hospital doesn't offer emergency service, what does the ED do?
8.
9. By how many physicians the ED is understaffed?
10. By how many nurses the ED is understaffed?

Teamworking

1. How do you set up the teams daily and how do you distribute the work to the personnel? (Πως οργανώνετε τις ομάδες και πως κατανέμετε τη δουλειά;
2. How often do you have meetings and how many participates? (Πόσο συχνά έχετε σύσκεψη στο ΤΕΠ; Πόσοι και ποιοι συμμετέχουν;)
3. Is it an agenda?
4. Who is speaking mainly?
5. How is the communication during the meeting?
6. Which are the main advices in a daily meeting?
7. How is the communication within the team (personal, or formal), between nurses and practitioners, between seniors and beginners, between ED and other departments, between ED and the hospital's management?
8. How would you characterize the relationship among the members of the team and with you?
9. How often do you see each other outside working hours?

Safety Management Systems

1. Do you record NearMISS and failures (cases that the result could be prevented)?
2. Do you have Morbidity and Mortality meeting?
3. Is there any other system you are using in order to improve or secure patients' safety?
4. Has your hospital adopted the emergency system "Safe hospital"?
5. Have you been trained for that?
6. Is it in use? If yes, could you please describe?
7. Do you have protocol for triage system?
8. Do you use protocols? If yes how and if no, why not?
9. Do you find them useful and why? Could you please explain your answer?

Work Pressure

1. How many patients do you serve in 1 shift?
2. How many hours do you work in 1 shift?
3. Which is the mortal rate per year in ED?

Competence

1. If you apply for personnel's training to the Hospital's Director, is it approved?
2. How do you practice continuous learning?

Problems

1. Which are the main problems you face as the Head of ED?
2. Which are the main problems that ED is facing?
3. How do you manage the employees' complains?
4. How many times have you requested in writing to the hospital's director?
5. What do you do, as the head of the department in order to enhance patient's safety?

Management training

1. Did you have any course on managing personnel?
2. If no, could you explain how could you manage the personnel?

What is your perception

ANNEX C "QUESTIONNAIRE"

ANNEX C "QUESTIONNAIRE"

Demographics	
Region	
Occupation	
Years	

Teamwork	
I have the support I need from other personnel to care for patients. Έχω την υποστήριξη που χρειάζομαι από το υπόλοιπο προσωπικό για να φροντίζω τους ασθενείς	4
Nurse input or feedback is well received in this ER. Οι εισηγήσεις των νοσηλευτών λαμβάνονται υπόψη σε αυτή το ΤΕΠ.	5
In this ED, it is easy to speak up if I perceive a problem with patient care. Σε αυτό το ΤΕΠ μπορώ να μιλήσω άνετα εάν αντιληφθώ κάποιο πρόβλημα που αφορά στη φροντίδα των ασθενών.	6
Disagreements in this ER are resolved appropriately (ie, not who is right, but what is best for the patient). Οι διαφωνίες σε αυτή το ΤΕΠ επιλύονται κατάλληλα (π.χ. όχι ποιος έχει δίκαιο αλλά τι είναι προς το συμφέρον του ασθενούς).	7
The physicians and nurses here work together as a well-coordinated team in this ER. Οι ιατροί και οι νοσηλευτές σε αυτή το ΤΕΠ εργάζονται μαζί σαν μια καλά συντονισμένη ομάδα.	8
I feel safe, in case I make a mistake, somebody will correct me on time. Αισθάνομαι ασφαλής σε περίπτωση λάθους μου, κάποιος θα με διορθώσει εγκαίρως.	9
Trainees are adequately supervised. Οι εκπαιδευόμενοι επιτηρούνται επαρκώς	10
This team in ER does a good job of training new personnel. Αυτή η ομάδα του ΤΕΠ κάνει καλή δουλειά στην κατάρτιση του νέου προσωπικού	11

Learning Culture	
The culture in this ER makes it easy to learn from the errors of other. Η εργασιακή κουλτούρα σε αυτή το ΤΕΠ διευκολύνει τη μάθηση από τα λάθη των άλλων	12
Medical errors are handled appropriately in this ER. Τα λάθη αντιμετωπίζονται κατάλληλα σε αυτό το ΤΕΠ.	13
I know the proper channels to direct questions regarding patient safety in this ER. Γνωρίζω τις κατάλληλες διαδικασίες για να υποβάλω ερωτήματα σχετικά με την ασφάλεια των ασθενών στο ΤΕΠ	14
I am encouraged by my colleagues to report any patient safety concerns I may have. Ενθαρρύνομαι από τους συναδέλφους μου να αναφέρω οποιεσδήποτε ανησυχίες μπορεί να έχω σχετικά με την ασφάλεια των ασθενών	15
I receive appropriate feedback about my performance. Λαμβάνω την κατάλληλη ανατροφοδότηση για την απόδοση μου στην εργασία	16
I would feel safe being treated here as a patient. Θα ένιωθα ασφαλής ως ασθενής αν νοσηλευόμουν σε αυτό το ΤΕΠ.	17
In this ER, it is not difficult to discuss errors. Σε αυτό το ΤΕΠ δεν είναι δύσκολο να συζητάς τα λάθη.	18

Job satisfaction	

Compering with other departments, I prefer to work in ER. Συγκρίνοντας με άλλα τμήματα, προτιμώ να εργάζομαι στο ΤΕΠ.	19
Compering with other hospitals, I prefer to work in this one. (Location is irrelevant.) Συγκρίνοντας με άλλα νοσοκομεία, προτιμώ να εργάζομαι σε αυτό. (Η τοποθεσία δεν αποτελεί κριτήριο)	20
I am proud to work at this ER. Είμαι περήφανος/η που εργάζομαι σε αυτό το ΤΕΠ.	21
Working in this ER is like being part of a large family. Όταν εργάζεσαι σε αυτό το ΤΕΠ είναι σαν αν είσαι μέλος σε μια μεγάλη οικογένεια.	22
Moral in this ER area is high. Το ηθικό σε αυτή το ΤΕΠ είναι υψηλό.	23
I like my job. Μου αρέσει η δουλειά μου.	24

Stress recognition / Awareness / Anticipation	
When my workload becomes excessive, my performance is impaired. Όταν ο φόρτος εργασίας μου αυξάνεται επηρεάζεται αρνητικά η απόδοσή μου	25
I am more likely to make errors in tense or hostile situations. Είναι πιθανότερο να κάνω λάθη όταν επικρατούν τεταμένες ή εχθρικές συνθήκες στην εργασία μου.	26
I am less effective at work when I am fatigued. Είμαι λιγότερο αποτελεσματικός/ή στη δουλειά όταν είμαι κουρασμένος/η.	27
I ask for help, or double check, when I am fatigued. Ζητώ βοήθεια, ή επανέλεγχο, όταν είμαι κουρασμένος/η.	28
I notice of objects/events in ER even if they are not immediately related to my work. Προσέχω/ αντιλαμβάνομαι αντικείμενα/γεγονότα μέσα στο ΤΕΠ τα οποία δεν σχετίζονται άμεσα με τη δουλειά μου.	29
I am disturbed / annoyed / sad when patients, or their relatives complain or have an argument about delays. Ενοχλούμαι / στενοχωριέμαι όταν οι ασθενείς, ή οι συγγενείς τους παραπονιούνται, ή διαπληκτίζονται για τις καθυστερήσεις.	30
How often there are quarrels in your working environment? (1 never, 10 frequently)	31
How often does violent event occurs in your working environment? (never, seldom, every 10 duties, every 5 duties, every 2 duties, every day	32

Perception of management	
Hospital management does not knowingly compromise the safety of patients. Η Διοίκηση του Νοσοκομείου δε διακυβεύει εν γνώση της την ασφάλεια των ασθενών.	33
Ministry of Health does not knowingly compromise the safety of patients. Το Υπουργείο Υγείας δε διακυβεύει εν γνώση της την ασφάλεια των ασθενών.	34
I am provided with adequate, and on time information about events in the hospital that might affect my work. Ενημερώνομαι επαρκώς και εγκαίρως για διάφορα πράγματα που συμβαίνουν στο Νοσοκομείο και μπορούν να επηρεάσουν την εργασία μου.	35
Staffing in ER is sufficient to handle the number of patients. Η στελέχωσης σε προσωπικό σε αυτό το ΤΕΠ είναι επαρκής για τη φροντίδα του αριθμού των ασθενών.	36
The management of the hospital listen carefully and takes seriously staff complains. Η διοίκηση του νοσοκομείου ακούει και λαμβάνει σοβαρά υπόψη της τα παράπονα των εργαζομένων.	37

Safety Management Systems	
All the appropriated protocols are established and in use for my job. Όλα τα απαιτούμενα πρωτόκολλα για την εργασία μου έχουν δημιουργηθεί και εφαρμόζονται.	38
All the protocols in use have major impact in patients' health. Τα πρωτόκολλα που εφαρμόζουμε έχουν κρίσιμη επίδραση στην υγεία των ασθενών.	39
The hospital I am working at, has emergency plans (heart attack, fire, missing child, etc.), has trained the appropriate involved personnel, and has communicated the plans to the staff. Το νοσοκομείο που εργάζομαι, έχει σχέδια διαχείρισης επείγουσας ανάγκης (καρδιακή προσβολή, φωτιά, αναζήτηση παιδιού, κλπ), έχει εκπαιδεύσει το απαιτούμενο εμπλεκόμενο προσωπικό και έχει κοινοποιήσει τα εν λόγω σχέδια σε όλο το προσωπικό.	40
In ED we have a morbidity & mortality meeting where I can report and discuss cases which their result could have been prevented. Στο ΤΕΠ έχουμε συνάντηση νοσηρότητας και θνησιμότητας όπου μπορώ αναφέρω και τίθενται σε συζήτηση περιστατικά που θα μπορούσε να αποτραπεί το αποτέλεσμά τους.	41

Effectiveness of Morbidity and Mortality meeting	
Do you have a M&M meeting?	42
How often is the M&M?	43
I participate.	44
I freely report any events.	45
It is useful	46
All the ERs should have such a meeting	47

Working conditions	
All the necessary information for diagnostic and therapeutic decisions is routinely available to me. Όλες οι απαραίτητες πληροφορίες για τις διαγνωστικές και θεραπευτικές αποφάσεις είναι διαθέσιμες σε εμένα σε καθημερινή βάση.	48
All the necessary material and equipment for diagnostic and therapeutic decisions is routinely available to me. Όλα τα απαραίτητα υλικά και εργαλεία για τις διαγνωστικές και θεραπευτικές αποφάσεις και ενέργειες είναι διαθέσιμες σε εμένα σε καθημερινή βάση.	49
This hospital does a good job of training new personnel. Αυτό το νοσοκομείο κάνει καλή δουλειά στην κατάρτιση του νέου προσωπικού	50

Type of Leadership's Relationship / Psychological safety	
I prefer to have intimacy with the head ED and not formality. Προτιμώ να έχω οικειότητα με τον διευθυντή του ΤΕΠ.	51
I have intimacy with the head of ED. Έχω οικειότητα με το διευθυντή του ΤΕΠ.	52
I trust the head of ED. Εμπιστεύομαι τον διευθυντή του ΤΕΠ.	53
The head of ED listens and takes seriously employees' complains. Ο διευθυντής του ΤΕΠ ακούει και λαμβάνει σοβαρά υπόψη του τα παράπονα του προσωπικού.	54
I feel safe to report my mistake to the head of ED. Αισθάνομαι ασφαλής να αναφέρω τυχόν λάθος μου στο διευθυντή μου.	55

Rate the most important factor of the ER's success with 6, up to the least important with 1.	56

Βαθμολογήστε τον πιο σημαντικό παράγοντα επιτυχίας του ΤΕΠ με 6, μέχρι τον ασήμαντο με 1.	
Core values of safety and caring. Έχοντας την ασφάλεια και τη φροντίδα ως βασικές αξίες.	
Teamworking support each other's gups. Η ομαδική εργασία αλληλοκαλύπτει τα τυχών κενά.	
Supervision within ER Εποπτεία-καθοδήγηση μέσα στο ΤΕΠ.	
Reported failures and lessons to learn. Καταγεγραμμένα σφάλματα τα οποία αναλύθηκαν και αποτέλεσαν μάθημα.	
Risk identification. Αναγνώριση κίνδυνου	
Work pressure Χαμηλός φόρτος εργασίας	
Competence Επάρκεια γνώσεων	
Procedures/Rules Διαδικασίες/Κανόνες	

Rate the characteristic that your supervisor should have in order to trust him/her (rated 1st is the most important up to 3 the least important)	Ability (Ικανότητα) Integrity (Ακεραιότητα) Benevolence (Καλοσύνη/Ανθρωπισμός)	57
Rate the most important quality a supervisor/head of ER should have for assuring patients' safety. (1st the most important up to 5 the least important)	Honesty (Ειλικρίνεια) Openness (Ευθύτητα / Οικειότητα) Consistency (Συνέπεια) Moral values (Ηθικές αρχές) Care/Concern (Φροντίδα/έγνοια)	58

Quality of service	
Rate the quality of service this ED offers	59