



**POSTGRADUATE PROGRAM IN HEALTH SERVICES  
ADMINISTRATION**

**POSTGRADUATE WORK**

**THE IMPORTANCE OF TEAMWORKING IN HEALTHCARE:  
CASE FROM A GREEK HOSPITAL**

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Αφιερώνεται σε όσους από τους συναδέλφους μου

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## **Abstract**

There has been a growing support for the use of interprofessional teamwork across health and social care organizations. The best and most cost-effective outcomes for patients are achieved when professionals work together, learn together, engage in clinical audit of outcomes together, and generate innovation to ensure progress in practice and service.

Medical and nursing / obstetric staff of a general hospital in Northern Greece participated in a teamwork survey. The aim of the study is to identify the differences of the health professionals toward the components of teamwork, as well as if age affects the attitude of the employees concerning these components.

The analysis of the survey data revealed, that between the two working groups (medical & nursing / obstetric) there are not serious deviations in their attitude towards the examined components of the teamwork. Differences were mainly observed between age groups, showing that experienced employees are more positive towards teamwork, while new employees with less experience are not so.

Organizations should promote teamwork, encouraging and supporting employees. Moreover, it is essential the educational institutes to include teamwork competences in their curriculum, providing the required skills to their students, before they will be members of a team in a health care organization.

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## **1. Introduction**

The importance of teamwork is being studied over the past 25 years and attention has been placed increasingly on how inter-professional teams can improve professional relationships, collaboration and quality of care. It is often considered that teamwork is the way in which professional relations should be managed and care should be delivered.

The aim of this study is to examine, in depth, the complexity degree of elements, factors and issues that affect the ways in which professionals work together. A range of concepts and theories help to understand inter-professional teamwork. Moreover, the evidence on the effects of interventions to promote teamwork and approaches to its evaluation, are also examined.

There is an increased interest for effective collaboration in healthcare policy internationally. This is because a large body of research evidence suggests that effective teamwork in healthcare is associated with reduced medical errors (Manser, 2009), increased patient safety (Firth-Cozens, 2001) and improved worker outcomes such as reduced stress (Carter & West, 1999), as well as the intent to stay at work (Abualrub et al., 2012), and job satisfaction (Buttigieg et al., 2011).

In addition, other studies have also found that the quality of teamwork in healthcare is related to patient mortality in hospitals (West et al., 2001), cost effective patient care (Ross et al., 2000), reduced physician visits and hospitalization rates (Sommers et al., 2000), lower staff absenteeism and turnover, more effective use of resources and last but not least greater patient satisfaction (West et al., 2011).

Most healthcare organizations operate in a complex context of conflicting demands and objectives, multi-faceted and often highly challenging daily tasks, in parallel with a demanding external environment, and a highly diverse body of professional clinical staff (Ramanujam & Rousseau, 2006). Therefore, as patients' progress along the care pathway and the delivery of effective healthcare very much depend on the careful collaboration and interchange of information between various individuals, organizations, occupational groups, multidisciplinary teams, and allied health services. Furthermore, it is important the changes that occur in healthcare systems to reflect on why effective healthcare teams are so important in health service delivery and how team processes can be improved to ensure that high quality and safe patient care is

delivering. The fact is that healthcare teams are very often ineffective with research showing that 70% of medical errors can be attributed to poor teamwork (Studdert et al., 2002).

In Greece, research and studies concerning the implementation of teamwork in healthcare are very poor till now. Limited number of studies indicated that, inefficient communication caused by the workload, lack of staff and unclear responsibilities create constant tensions between health staff which affects their inter-professional collaboration. Nevertheless it hasn't investigated enough the components that influence the effective teamwork in Greek hospitals.

The aim of this study is also to identify the importance of teamwork in healthcare and the attitude of health professionals concerning Team Structure, Leadership, Situation Monitoring, Mutual Support and Communication. For this reason a survey has been executed within the organization of a hospital in Northern Greece. This survey was based on a specific questionnaire (Team STEPPS), which had been prepared for the U.S. Department of Defense, Tricare Management Activity, by David P. Baker, Ph.D. Kelley J. Krokos, Ph.D. Andrea M. Amodeo, M.S. in 24 September 2008 and revised in 7 October 2008 (David et al., 2008). This questionnaire covers all the above mentioned 5 dimensions of teamwork. The methodology and the results of the statistical process of the questionnaires, as well as the conclusion and the proposal are presented in the relative chapters of this study respectively.

Considering the literature and the finding of the study, it is highlighted that health organizations in Greece need advice on how to develop authentic and effective teamwork which facilitates a culture for safety and quality, rather than relying on the dangerous illusion that simply a group of healthcare professionals, so called 'team', will produce the coordination, clear role allocation and powerful shared responsibility, which are the notion of 'teamwork'.

## 2. Literature review

### 2.1. The concept of the team at the working environment

#### 2.1.1. Team Definition

There is a variance in definitions about team that is due in part to the diversity of team types. Teams carry a variety of purposes (e.g., learning, producing a product, solving problems, gaining acceptance), forms (e.g., virtual, co-located), size and longevity (e.g., ad hoc, long term) (Cohen & Bailey, 1997).

After reviewing several often-cited definitions the following definition is the most representative. **“A team is two or more individuals with specified roles interacting adaptively, interdependently, and dynamically toward a common and valued goal”** (Salas et al., 1992). However, it is believed that effective teams require more than just task work (e.g. interaction with tasks, tools, machines, and systems) (Bowers, et al., 1997).

Katzenbach and Smith (1993) stated that **“.... team is a small number of people with complementary skills who are committed to a common purpose, performance, goals, and approach, for which they hold themselves mutually accountable”**.

In addition, regular communication, coordination, distinctive roles, interdependent tasks and shared norms are important features (Brannick & Prince 1997).

Fundamental elements for successful and effective teams are, the ability to coordinate and cooperatively interact with each other to facilitate task objectives through a shared understanding of the team's resources (e.g. members' knowledge, skills, and experiences), the team's goals and objectives, and the constraints under which the team works (Salas et al., 2005). Moreover, teams have the potential to offer greater adaptability, productivity, and creativity than any one individual can offer and provide more complex, innovative, and comprehensive solutions to organizational problems (Sundstrom, et al., 1990).

Although teams have great potential, their failure can have far reaching effects on their respective organization (e.g., missed deadlines, low productivity, lost revenue, faulty products (Alderfer, 1977). It has become clear that teams are not easily implemented. The creation of a team of skilled members does not ensure success. In fact, many teams never reach their full potential, and many fail together (Hackman, 1998).

### **2.1.2. Teams Classification**

The teams' classification has been proposed by a number of researchers in order to provide more clarity, delineating the tasks of a team and the needed competencies, the stability of team memberships, the interaction and communication of team members, and the life span of the team (Devine, 2002). More specifically, Mc Grath (1984) developed three types of teams such as, natural, concocted and quasi-groups, while Sundstrom (1999) explicated another commonly accepted taxonomy and specifies six types of team with diverse requirements and tasks such as, management, service, production, project, action and parallel.

Many typologies focus on the order in which portions of the team task are completed and the amount of interdependence among the team members that is required (Steiner, 1972).

For instance, Steiner (1972) distinguished among types of tasks as disjunctive, conjunctive, additive, discretionary, compensatory, complementary, and divisible.

Some researchers have put forth very complex models to describe team tasks. Shaw (1976) differentiated among team tasks based on difficulty, solution multiplicity, intrinsic interest, cooperation requirements, familiarity, and problem-solving requirements.

Other researchers (Boguslaw & Porter, 1962) make a distinction as to whether the team's tasks are established or emerge over the course of team performance.

In conclusion, as one begins to examine the team literature, it become clear that the types of teams are as varied as the number of authors who have discussed them. Therefore, it becomes necessary to focus on the actual tasks that teams perform and the required competencies of the team members, in order to understand the processes that will lead to team effectiveness, achieving the goals.

### **2.1.3. Teams Typologies**

Authors have also provided a range of different typologies in order to differentiate the types of teams. In general, this suggests that teams can be placed on a spectrum from poor teams' (e.g. those who do not work in an integrated fashion and interact infrequently) to good teams' (those who share an integrated approach and interact on a regular basis). Below is summarized a number of the more well-known typologies

Bruce (1980) devised a model that includes three types of teams.

The first type is a nominal team in which members do not share a common goal; may have little idea of each other's roles; where communication is poor; and where there is generally little interaction between members. The second is a convenient team in which a few members share a common goal; there is some understanding of members' roles and responsibilities, but where there is only limited interaction and communication between members. The third is a committed team in which all members share a common goal, in which roles and responsibilities between team members are well understood and where there is good communication and regular interaction between members.

Similar approach has also been introduced by Jelphe and Dickenson (2008) who have focused on the extent to which individuals from different disciplinary backgrounds collaborate within teams. In their work teams have distinguished between multidisciplinary, interdisciplinary, and transdisciplinary teams. The first type of team is one in which team members work in parallel, or side-by-side with each other but with little interaction; the second type of team in which members work together in an interactive fashion; and the final type as one in which members work is integrated and transcend their separate, conceptual and methodological orientations (p13). The authors note that this final type of team can be considered as the highest form of team.

Katzenback and Smith (1993) developed a model that contains five different types of team:

- Working groups in which members hold some shared information and undertake some team activities, but where there is no joint responsibility or clear definition of team roles
- Pseudo teams in which members are labeled as a "team" but, in reality, have little shared responsibility or co-ordination of their teamwork
- Potential teams in which members are beginning to work in a collaborative manner but have few of the factors needed for effective teamwork, such as the sharing of common team goals
- Real teams in which members share common goals and share some accountability

- High performance teams in which members all hold a clear understanding of their roles, all share common team goals and, in addition, encourage members' personal development.

According to the above mentioned references it becomes clear that the teams typologies are mainly related to the team performance classifying teams in a measurable scale based on qualitative criteria.

#### **2.1.4. Team roles**

The formation and preservation of clear professional roles is seen as an essential element for an effective interprofessional team relations and team performance (West & Markiewicz, 2004). Clear roles help define the nature of each team members' tasks, responsibilities and scope of practice. Clear roles within a team help to ensure that problems around professional boundary infringement are avoided. Nevertheless, on occasions teams work in a generic manner where different team members share roles. However, general work can generate friction between team members as they are unclear about their respective professional roles (Booth J & Hewison, 2002).

#### **2.1.5. Team processes**

Team processes are multidimensional and they are mainly consisted of the following elements:

- Communication
- Team emotions
- Trust and respect
- Humor and Conflict.
- Team stability
- Individual willingness
- Team building activities

A more detailed presentation of these elements is presented in the following paragraphs.

### ***Communication***

To have effective communication in the work place, team members must keep an open mind, engaging in active listening and have a clear understanding of project goals and requirements. Active listening is perhaps the most important of these. Active listening involves note taking, asking relevant questions and repeating what the other person says to verify clarity.

Effective communication determines the success or failure of projects requiring teamwork, and ultimately, the business itself. When team members communicate with open minds, and by asking questions rather than making assumptions, they build trust and harmony in the working environment. These elements work together to create a business culture of camaraderie and success.

### ***Team emotions***

Emotions are inherent to team life. Observers use team members' analytical emotional observations, as a source of information to predict the team's trajectory. It is truth that the sense of sadness elicits more pessimistic inferences regarding team dynamics (e.g., trust, satisfaction, team effectiveness, conflict) compared to the sense of happiness. Team members' emotional observations are used as indicators of team functioning (Astrid et al., 2015).

### ***Trust and respect***

The development of trust and respect within an interprofessional team is another important relational element. In many ways, trust and respect is built through shared experience, particularly during instances, in which team members can demonstrate their technical skill and professional competence. Often a new member is not trusted until their abilities are proven (Simpson et al., 2006). High levels of trust and respect, which are usually based on the stable team membership, can allow team members to work together in a close, integrated fashion (Institute of Medicine 2004b). Absence of these qualities can, however, be problematic. A lack of respect is a key source of interprofessional conflicts between members that working together.

### ***Humour - Conflict***

The use of humour in teams can play a number of important functions. It can be used to emphasize existing rules and boundaries, reinforcing however the power imbalances or causing interprofessional tension (Griffiths 1998). Audio recordings of team meetings revealed that humor was used as a way to exhaust tensions within team members “letting off steam” in relation to the general stresses and strains of working together. It was also a mechanism that helped team members support each other in their difficult work.

Conflict between team members can arise due to a number of relational factors. While interprofessional conflict can be problematic to team relationship and team performance, it could also have positive effects. West (1994) for example, states that conflict between members can be a source of innovation and a source of excellence, quality and creativity. Nevertheless, any conflict needs to be well handled within a team. If not, it can become damaging to interprofessional relations and team function.

It has also been found that absence of conflict or friction within a team can develop a phenomenon termed “groupthink” where there is a lack of disagreement and debate between team or group members. In such teams, rather than seek opposing views and opinions, members prefer to focus upon reaching agreement and consensus. This can mean that teams can fail to consider all range of possibilities around how they solve a particular problem (Reeves, 2008).

### ***Team stability***

The stability of team membership also has an effect on interprofessional relations. Where an inter-professional team has stable membership it is likely to performance in a more effective manner as, over time, members will have been able to develop mutual understanding and trust with one another (Gair & Hartery 2001). Nevertheless, as Vanclay (1996) noted in health and social care, achieving stability can be difficult. There may be a regular turnover of staff which can mean that there is rarely sufficient time for team members to “know each other well and foster a teamwork ethos”.

### ***Individual willingness***

Willingness to work in a collaborative manner cannot simply be assumed. Individuals need to be willing to engage in teamwork. As Henneman and colleagues (1995) point out, “only the person involved ultimately determines whether not collaboration occurs”. Willingness to engage (or not) in teamwork can involve a number of factors. As Skjorshammer (2001) found, interprofessional collaboration depended on a number of elements, including the nature of the task, the urgency and the need for interdependence between professions. Therefore, if an individual felt that a task had both low urgency and low interdependence, they may avoid engaging in interprofessional work.

### ***Team building activities***

Regular team building activities aimed at enhancing collaborative processes can help teams improve their performance. Typically, such activities include a range of interactive learning opportunities (e.g. workshops, retreats, and more recently online sessions) which aim to develop and enhance teamwork attitudes, knowledge, skills and behaviors. The use of team reflection activities can, for instance, be helpful for team function. West (1996) argues that teams which can spend time together reflecting upon their collaborative work can develop into a “reflexive” team. The development of a reflexive team can help to ensure that members are able to adapt and respond collectively to changes they encounter.

Teams can do more than simply interact with tools. They require the ability to coordinate and cooperatively interact with each other to facilitate task objectives through a shared understanding of the team’s resources (e.g., members’ knowledge, skills, and experiences), the team’s goals and objectives, and the constraints under which the team works. Essentially, teams require teamwork.

## **2.2. The concept of the teamwork at the working environment**

### **2.2.1. Inter-professional Work**

According to Scott Reeves (2010) teamwork is only one of the forms of interprofessional work which could be considered. Other forms are collaboration, coordination and networking. Depending on local need, these forms of interprofessional

work may be more effective than a teamwork approach. A brief explanation of the four types of the interprofessional work is presented in the following paragraphs.

### ***Teamwork***

As above mentioned, teamwork encompasses a number of core elements, but it is not only restricted to them, since the shared team identity, the clarity, the interdependence, the integration, the shared responsibility, and the team tasks are generally unpredictable, urgent and complex. Examples of this type of interprofessional work include intensive care teams and emergency department/room teams (Piquette et al., 2009).

### ***Collaboration***

Collaboration is a “looser” form of interprofessional work. It differs from teamwork in that shared identity and the integration of individuals are less important. However, it is similar to teamwork in requiring shared accountability between individuals, some interdependence between individuals, clarity of roles/goals and team tasks are generally a little more unpredictable, less urgent and complex. Examples of this type of interprofessional work can be found in primary care and general medical settings (Delva et al., 2008).

### ***Coordination***

Coordination as a form of interprofessional work is similar to collaboration in terms of shared identity. However, integration and interdependence is less important. Team tasks are more predictable, as well as less urgent and complex than collaboration. Coordination is similar to collaboration in that it does require some shared accountability between individuals and clarity of roles/tasks/goals. This type of interprofessional work has been described by Gittel and colleagues (2000) who used the notion of “relational coordination”, which comprises frequent, timely and accurate communication among providers in order to coordinate care. Examples of this type of interprofessional work can be found in the case management literature which describes how individuals, usually called case managers coordinate the work of the other team members.

## *Networking*

A networking relationship is one in which the shared team identity, the clarity of roles/goals, the interdependence, the integration and the shared responsibility are less essential. Tasks are also more predictable, non-complex and non-urgent. Networks can be virtual, in the sense that perhaps none of its members will not meet face-to-face during the work, but they communicate in an asynchronous manner by use of the Internet (e.g. email or computer conferencing). Ovretveit (1997) notes that networks are informal arrangements with a changing membership, highlighting that individual may move through these networks as the need arises for specific skills or expertise. Examples of this type of interprofessional work include networks of clinicians who share information on adverse reactions to drugs, or groups of clinicians who meet to discuss the application of clinical guidelines across a number of institutions

### **2.2.2. Teamwork Definition**

Organizations (both work and non-work) are increasingly using teams to streamline processes, enhance participation, and improve quality. Hence, teams are becoming the primary building block of most organizations. A study by Gordon (1992) found that 82% of U.S. companies with 100 or more employees utilize some form of teams. Teams are found in such diverse fields as education, religion, science, manufacturing, and consulting.

Teams associate both private and public life, individuals must be able to work and perform in a team context to function effectively in today's society. So it is proven the importance of interpersonal skills (teamwork) in work and everyday life.

Teamwork has traditionally been described in terms of classical systems theory, in which team inputs, team processes, and team outputs are arrayed, over the time. The team inputs include the characteristics of the task to be performed, the elements of the context in which teamwork occurs and the attitudes of the team members leading to a team situation. Team process includes the interaction and coordination among members required for performing team tasks and achieving specific goals. Team outputs are consisted of the products that result from team performance (Ilgen, 1999).

During the phase of process the team members interact and work together to produce team outputs proving the teamwork.

### **2.2.3. Culture and teamwork**

Several notable studies have examined the attitudinal differences among workers of different cultures. Hofstede (1985) explored a matched sample of employees in a single, multinational corporation in 40 countries. He found wide differences in attitudes toward collaboration. Individualistic countries were more likely to reject collaborative work, preferring to work on their own, whereas collectivist cultures preferred collaborating with others.

In related work, examined the differences between American managers of Japanese ancestry and those of Caucasian ancestry and similarly, a study by Pizam and Reichel (1977) examined the differences between Israeli managers of Oriental ancestry and those of Western ancestry. In these studies, cultural differences were observed in areas such as respect for formal authority, commitment to long-term employment, paternalism with respect to subordinates, and interest in teamwork.

Parallel findings were found in cross-cultural research, conducted at the Center for Creative Leadership, on teamwork and team leadership. More judicious use of personal prominence and power, greater openness to the ideas and interest of others, and mitigation of tough mindedness, are more acceptable among team leaders in Europe, as compared to those in the U.S. (Leslie & Velsor, 1998).

Finally, a collective orientation enhances the team performance, whereas an individualistic orientation inhibits the teamwork. Kirkman (1997) found that, in the U.S., Finland, Belgium, and the Philippines, the amount of resistance to working in a team vary, depending upon the cultural orientation of employees. Respondents with individualistic values show resistance working in teams, more than did respondents with collectivist values. Further, respondents who valued power distance reported higher levels of resistance to self-management, than did those who are placed at a low value on power distance.

### **2.2.4. Team Knowledge, Skills & Attitude Competencies.**

#### ***Knowledge Competencies***

Team knowledge competencies are defined by Cannon-Bowers and colleagues (1995) as the principles and concepts that underlie a team's effective task performance. To

function effectively a team, team members must know what team skills are required, when particular team behaviors are appropriate, and how these skills should be utilized in a team setting.

In addition, team members should know the team's mission and goals and be aware of each other's roles and responsibilities in achieving those goals. Such knowledge enables team members to form appropriate strategies and synergies for interaction, to coordinate with other team members, and to achieve maximum team performance.

Regarding the core knowledge competencies, team members must know how and when to use the teamwork skills. Therefore, important knowledge and competencies for team members are how to communicate each other, how to interact and resolve conflicts, how to plan and make team decisions, and how to adapt and provide assistance to other team members.

The core team knowledge competencies identified above are considered as prerequisite to skill execution. Two competencies are presented separately in order to distinguish, because it is believed that they are two critical facets of teamwork: knowing what to do in a team versus doing it. So knowledge competencies, as defined, are directly related to team member skills and to the level of teamwork achieved.

### ***Skills Competencies***

Team skill competencies are defined as, the learning capacity of the team members to interact with other team members, at some minimal proficiency level.

Cannon-Bowers and colleagues (1995) found 130 different skill labels that are used to refer the same teamwork skills, or the same labels are used to refer different skills. They sorted them into the following eight major teamwork skill categories:

- Adaptability
- Situation awareness
- Performance monitoring
- Feedback
- leadership
- Interpersonal relations
- Coordination
- Communication
- Decision making

From the above mentioned skills, four of them were identified as “core” team skills competencies. These are the communication, the interpersonal relations (which includes cooperation and dealing with conflict), the group decision making/planning, and the adaptability/flexibility.

Communication involves the exchange of clear and accurate information and the ability to clarify or acknowledge the receipt of information. Strong communication skills are demonstrated by team members, who have the following characteristics:

- Provide clear and accurate information
- Listen effectively
- Ask questions
- Acknowledge requests for information
- Openly share ideas
- Attend to non-verbal behaviors

Interpersonal Relations is a broad area that encompasses cooperation and dealing with conflict within the team. Therefore, effective interpersonal relations include, working cooperatively with others, working together as opposed to working separately or competitively, and resolving disputes among team members.

Group Decision Making/Planning is defined as the ability of a team to gather and integrate information, use logical and sound judgment, identify possible alternatives, select the best solution, and evaluate the consequences.

Strong group decision making and planning skills are demonstrated by team members who work with others in order to:

- Identify problems
- Gather information
- Evaluate information
- Share information
- Understand decisions
- Set goals

Adaptability/Flexibility is defined as the process by which a team is able to use information gathered from the task environment, in order to adjust strategies through the

use of compensatory behavior and reallocation of intra-team resources. Strong adaptability/flexibility skills are demonstrated by team members with the following characteristics:

- Provide assistance
- Reallocate tasks
- Provide and Accept feedback
- Monitor/Adjust performance

### *Attitude Competencies*

Team attitude competencies are defined as an internal condition that influences a team member's choices or decisions to act in a particular way (Dick & Carey, 1990).

Positive attitudes toward teamwork and mutual trust among team members are examples of critical attitudes related to team process.

Vaziri, Lee, and Krieger (1988) found that higher levels of mutual trust among team members, lead to a more harmonious and productive team environment and finally, an attraction to being part of a team (i.e., collective orientation) is critical.

The following two attitude competencies were identified:

Belief in the Importance of Teamwork and Collective Orientation. As Driskell and Salas (1992) point out, individuals who tend to possess positive attitudes toward teamwork are most likely to take advantage of the benefits teamwork has to offer. Such individuals believe a team approach is better than an individual one. Compared to individually-oriented team members, they are better at taking another team member's behavior into account.

Cannon-Bowers and Salas, (1997) delineated the following three types of team knowledge, skills, and attitude competencies.

First, "individual competencies" are defined as the knowledge, skills, and attitudes required on the part of individual team members, in order to perform position requirements. These competencies enable team members to perform tasks that are specifically assigned to them.

Second, "team competencies held at the individual level" is defined as the knowledge, skills, and attitudes that are generic with respect to a team and its tasks. Essentially, these competencies are transportable to different teams and different team settings.

Third, “team competencies held at the team level” is defined as the knowledge, skills, and attitudes that are specific to a particular team and task. Unlike team competencies at the individual level, these competencies are not transportable. They only have meaning within the team.

By definition, these competencies are of great interest to policymakers and educators, because they enable individuals to function effectively in a wide variety of teams and a wide variety of team settings.

### **2.2.5. Team performance and effectiveness**

Many researchers have shown that it is the teams processes that ensure team effectiveness (e.g., Hackman, 1987), because teams failure may be due to factors such as, poor planning, a lack of support by their creators, or a breakdown in internal team processes (e.g., communication).

On the other hand a number of researchers have conceptualized team performance as a function of each team members individual input, minus the process losses associated with working with others (Shiflett, 1979).

So it is clear the importance to make a distinction between team performance and team effectiveness (Guzzo & Shea, 1992).

**Team performance** is affected by the outcomes of the team’s actions, regardless of how the team may have accomplished the task. Conversely, **team effectiveness** takes a more holistic perspective in considering not only the team performance (e.g., completed the team task), but also how the team interacted (e.g., team processes, teamwork) to achieve the team outcomes.

### **2.2.6. “Big Five” in teamwork**

Eduardo Salas, Dana E Sims and Shawn Burke in University of Central Florida, (2005) conducted an extensive review based on 20 years literature. This review includes both empirical studies and theoretical models of team effectiveness sources. They identified more than 20 primary and secondary sources and looked for variables that could develop through interventions. A thematic analysis of the variables, which have been

most commonly discussed and having the greatest effect on team performance were included in their framework.

This thematic analysis (i.e., classifying articles in general themes), suggested that in interdependent teams, the variables that seemed to affect team functioning, evolve around issues of leadership, supporting behavior, and flexibility.

The researchers reached to the conclusion, that regardless of the team task that is examined, a focal set of team work components will be required, in order the team to complete the task and they presented this work components as the “Big Five” of teamwork.

Although, each of the “Big Five” is required for team effectiveness, each component may be manifested differently across most team task types, because of the constraints of the team task and the varying needs of the team during a given challenge or change.

The most frequent variables which are identified as important aspects of teamwork are the following:

- Team leadership,
- Mutual performance modeling,
- Backup behavior,
- Adaptability,
- Team orientation

Based on their analysis, they suggest that these are the five core components that promote team effectiveness, which they are submitted as the “Big Five” in teamwork.

Although, team work is summarily described by the “Big Five,” supporting and coordinating mechanisms are needed to meld together the value of each of the five factors.

Coordinating mechanisms for effective teamwork are the development of shared mental models, achievement of mutual trust and engagement in closed-loop communication.

Furthermore, they acknowledge that the ability for the team to engage in the “Big Five” and its coordinating mechanisms will vary over the course of the team task as the team gains experience working together.

### *Team Leadership*

Team Leadership is defined as the ability to direct and coordinate the activities of other team members. The team leadership mainly assesses team performance, assign tasks, develop team knowledge, skills and abilities, as well as motivate team members, plan and organize and last establish a positive atmosphere (Zaccaro et al., 2001).

According to the above definition, the team leadership facilitates solving the team problems and provides performance expectations and acceptable interaction patterns. Synchronizes and combines individual team member contributions. Seeks and evaluates information that affects team functioning, clarifies team members' roles, engages in preparatory meetings and feedback sessions with the team (Marks et al., 2000).

Team leadership affects team effectiveness, not by handing down solutions to the team, but rather by facilitating team problem solving through cognitive processes, coordination processes, and the team's collective motivation and behaviors (Salas et al., 2001).

Team leaders enable effective teamwork and interdependent action through three overarching functions:

First, the team leader has a role in the creation, maintenance, and accuracy of the team's shared mental model, often he/she is in the best position to provide accurate and comprehensive information to the team, regarding the resources and constraints of the team (Zaccaro et al., 2001).

Second, the team leader facilitates team effectiveness by monitoring the internal and external environment. The leader promotes team effectiveness by using the information about the external environment to coordinate team behaviors and interactions (Zaccaro et al., 2001), as well as by providing skill development opportunities as needed. If the internal team functioning is faulty, the leader must determine what changes are needed and must reestablish adaptive norms and performance expectations accordingly.

Third, a function of the team leader is establishing behavioral and performance expectations and tracking the abilities and skill deficiencies of each team member (Salas et al., 2001).

Considering the three leadership functions together, it is concluded that team leaders ultimately facilitate team effectiveness, not only by synchronizing and combining the

individual contributions of each of the team members, but also by insuring individuals on the team understand their interdependence and the benefits of working together (Zaccaro et al., 2001).

### ***Mutual performance monitoring***

Mutual performance monitoring has been defined as the ability to keep track of fellow team members' work while carrying out their own, to ensure that everything is running as expected and to ensure that they are following the procedures correctly (McIntyre & Salas, 1995).

Roby and Lanzetta (1957) found that overloaded team members are more likely to make errors, as well as individuals may not be aware of their own performance deficiencies.

It is the information gathered through mutual performance monitoring that affects team performance by identifying errors or lapses, and this information, expressed through feedback and backup behavior. This boosts the team from the sum of individual performance to the synergy of teamwork and ultimately to team effectiveness.

In order to accomplish effective mutual performance monitoring, the following prerequisites were identified:

A shared understanding of the task and team responsibilities is required. This means that a shared mental model is important. If the team does not share the same mental model for how the team should be performing, performance monitoring becomes ineffective, and any feedback that could potentially be given becomes inconsequential. Conclusively mutual performance monitoring must become an accepted norm intended to maximize team performance, rather than an opportunity for team members to keep tabs on each other (McIntyre & Salas, 1995).

Therefore, the other prerequisite is the creation of an open, trusting, and cohesive team climate. Without this team climate, team members may view performance monitoring negatively and may react critically to feedback or assistance provided by a team member.

### ***Backup behavior***

Backup behavior is the ability to anticipate other team members' needs through accurate knowledge about their responsibilities. This includes the ability to shift workload

among members, in order to achieve balance during high periods of workload or pressure (Porter et al., 2003).

The way that backup behavior occurs, is by recognizing potential backup providers when there is a workload distribution problem in the team, shifting of work responsibilities to underutilized team members and completion of the whole task or parts of tasks by other team members.

Backup behavior is expressed in three means:

- Provide feedback and coaching to improve performance.
- Assist the teammate in performing a task.
- Complete a task for the team member when an overload is detected.

When it is found that a team member's workload has surpassed his or her capacity through mutual performance monitoring, the team can engage in backup behaviors by shifting work responsibilities to other underutilized team members as it becomes necessary. Research has shown that providing flexibility in how work is completed increases team effectiveness (Campion et al., 1993).

The importance of back up behavior does not simply lie in improved performance outcomes, but rather in how back up behavior affects team processes, to allow greater team adaptability in changing situations and environments (Salas et al., 2005).

It is possible, back up behavior sometime to be considered as "helping". Theorists suggest that there are differences between back up behavior and "helping", as Porter and colleagues (2003) suggest the primary difference is that backup behavior is a response to the recognition of a genuine need for assistance.

### ***Adaptability***

Adaptability has been defined as the ability to recognize deviations from expected action and readjust actions accordingly (Priest et al., 2002).

Research by Campion, Medsker, and Higgs (1993) has shown that teams whose members were more adaptable were rated as more effective, than were teams with members who were not flexible.

Adaptability causes when the team identify that a change has occurred, assign meaning to that change, and develop a new plan to deal with the changes.

As it has been already presented, in regard to backup behaviors and performance monitoring, team members must remain vigilant in the activities of other team members to detect errors and determine if additional information or assistance is needed and whether the team as a whole should adapt their planned actions.

Changes in the environment or team task must be assessed to determine if the current team processes will continue to be effective in reaching the team objectives. In addition adaptability assists teams to respond to unexpected demands (Salas et al., 2005).

Frequently, team members act in routine or habitual ways with each other so they may not see changes in the environment as quickly. This mindlessness can result in a greater chance of errors, productivity loss, or missed opportunities for innovation and improvement (Weick & Roberts, 1993).

### ***Team orientation***

Team orientation defined as the propensity to take another's behavior into account during group interaction and the belief in the importance of team goals over individual members' goals.

Team orientation is realized by taking into account alternative solutions provided by teammates and appraising that input to determine what is most correct.

Team orientation is not only a preference for working with others, but also a tendency to enhance individual performance through the coordination, evaluation, and utilization of task inputs, from other members while performing group tasks (Driskell & Salas, 1992).

It has also been found, that team orientation results increased cooperation and coordination among team members (Eby & Dobbins, 1997) and this may facilitate team performance through increased task involvement, information sharing, strategizing, and goal setting.

According to research, team orientation may be a malleable attitude based on past experiences in teams, on the perceived ability to complete the task and on expected positive outcomes (Eby & Dobbins, 1997).

The ways in which management can facilitate the development of team orientation is the provision of feedback about team successes and cooperation, the focus on the

expectations of the work load sharing, the communication and the accountability, as well as the creation of a norm for cooperative behavior, through reward systems (Eby & Dobbins, 1997).

### **2.2.7. Coordinating Mechanisms**

Entin, Serfaty, & Deckert, (1994) found that teams that were trained on the performance monitoring, adaptation, and facilitative leadership, which are the three out of the five suggested teamwork dimensions, had better performance. It would only be with the addition of coordinating mechanisms that the team could be assured success.

The need for coordinating mechanisms is not a unique concept. In fact, a similar concept was proposed in Shiflett's (1979) model of team performance, in which the team inputs required so-called transformers to achieve team outputs.

Concerning the introduction of the "Big Five," it will become clear that for team members who effectively work together, individuals must have a clear understanding of their roles in the task, as well as the available resources, and the capabilities of their teammates. In addition, teams must maintain a degree of mutual trust to freely communicate information throughout the team (Cannon-Bowers et al., 1995).

These coordinating mechanisms, which are examined in this paragraph, include the following elements:

- Shared mental models,
- Closed - loop communication,
- Mutual trust.

#### ***Shared Mental Models***

Mental models are what individuals use to organize or encode information, such as the dynamics of the environment in which they are embedded and the response patterns needed to manage these dynamics, as well as the purpose of the team, and the interdependencies among team members' roles (Zaccaro et al., 2001).

Working cooperatively requires that team members are coordinated by anticipating and predicting each other's needs, through common understandings of the environment and expectations of performance (Salas et al., 2005).

Two types of mental models have been frequently discussed in relation to team performance. These are the “team-related mental models” and the “task-related mental models” (Salas, & Cannon-Bowers, 2000).

*Team-related mental models* have to do with the team functioning and expected behaviors, whereas *task-related mental models* contain information regarding the materials needed for the task or the manner in which the equipment is used.

The shared mental models facilitate the team’s progression toward goal attainment by creating a framework that promotes common understanding and action (Zaccaro et al., 2001). Without this shared understanding, the individual members may be headed toward different goals, thereby leading to ineffective feedback or assistance, or the inability to anticipate each other’s actions or needs (Cannon-Bowers et al., 1993).

In addition, it has been found that teams which share similar mental models, communicate more effectively, perform more teamwork behaviors, are more willing to work with team members on future projects (Rentsch & Klimoski, 2001) and generally perform better although some types of mental models are more important for certain tasks than are others (Cannon - Bowers et al., 1993).

In teams that must perform in stressful conditions, these mechanisms seem more important. A team member’s encounter stress, the amount of communication often decreases, forcing the team to rely more heavily on implicit coordination rather than on explicit communication. Empirical research has found that teams which have developed shared mental models, have more accurate expectations for the needs of the team and the teammates during periods of stress (Salas, Cannon-Bowers, & Johnston, 1997).

### ***Closed - Loop Communication***

Communication is the exchange of information between two or more individuals irrespective of the medium (Salas & Cannon-Bowers, 2000).

In environments with increased complexity, communication is especially important as it not only distributes needed information to other team members, but also facilitates the continuous updating of the team’s shared mental model (Salas et al., 1997).

In some cases communication fails to occur, because of individuals’ perspectives and biases they will receive very different messages, when hearing the same communication

(Bandow, 2001). When the environment has become stressful and team members have become focused on their individual tasks, rather than on how those tasks affect other team members' tasks, communication may be hindered. Moreover, providing too much information (information overload), can degrade performance in teams that are performing in stressful environments (Johnston & Briggs, 1968).

Closed-loop communication will be a more effective, by combining information, exchanging difficulties and ensuring that sent communications are heard and accurately understood.

Closed-loop communication involves

- The sender initiating a message
- The receiver receiving the message, interpreting it, and acknowledging its receipt
- The sender following up to insure the intended message was received  
(McIntyre & Salas, 1995)

### ***Mutual Trust***

Without sufficient trust, team members will spend time and energy protecting, checking, and inspecting each other, as opposed to collaborating to provide value-added ideas (Cooper & Sawaf, 1996).

Trust in the team setting has been defined as the shared perception, that individuals in the team will perform particular actions important to its members and will recognize and protect the rights and interests of all the team members engaged in their joint endeavor (Webber, 2002).

Trust is cited as affecting a variety of team processes and outcomes such as group participation and contribution, cycle times, product quality, and even team member retention (Bandow, 2001).

Jones and George (1998), found that in addition to mediating cooperation and teamwork, trust also fosters a willingness to disseminate information more freely, among team members. If team members do not feel that their input is valued, or that the information they provide will be used appropriately, they may be less willing to share

that information. Team members may not be willing to participate in information sharing, if they fear being perceived as incompetent (Bandow, 2001).

Therefore, through the fostering of mutual trust, it is understood and accepted by team members that group members in fact are looking out for each other, for the good of the team. Trust is also needed in the acceptance of team leadership behaviors. If team members do not trust each other, or their team leader, they will be less willing to appear uninformed, thereby hindering the team leader from effectively managing the team.

#### **2.2.8. The “Big Five” in relation to team development and task episodes**

To ensure that a team is successful, the existence of teamwork is not enough. Dyer ((1984) suggested, that deeper knowledge is needed, about how team members interact and whether those interactions differ with over time, because of the situation and/or the experience of the team. Furthermore, one of the largest measurement problems in team research is the failure to examine the sequence of team behavior and the related outcome of that sequence of behaviors. So, it is realized that teamwork is dynamic and that its manifestation can vary based on a vast number of variables. (e.g., team environment, type of task, individual difference, perceived workload).

For this reason, the understanding of the team performance it is insufficient, in case that is based on a single snapshot of team performance. Instead, performance should be sampled during a variety of conditions and situations, including both laboratory and applied research settings, to get an accurate picture (Marks et al., 2000).

Teams become more effective over time, as their members learn to work together and become increasingly proficient in their task work (Morgan et al., 1986).

Improvement in team performance may in part be due to team members developing expectations about each other, establishing procedures for working together and developing shared knowledge and requisite communication behaviors (Dyer, 1984).

Several researchers have offered models of team development that suggest that teams go through stages of development, in which teams learn their tasks, their roles, and their expected performance and then teams progressively proceed into more complex relationship, building and teamwork behaviors (Morgan, Salas & Glickman, 1994).

The steps of team development form follow a pattern that is guided by individual team member characteristics and experiences, by the team task, and by environmental

constraints (Morgan et al., 1994). Therefore, it is hypothesized that the “Big Five” and its coordinating mechanisms will vary in importance during the early development stages of the team (e.g., team leadership, communication), whereas other core components will gain prominence later in team development, as teams proceed through phases of the team task (e.g., performance monitoring, backup behavior).

So far, there is little empirical or theoretical research available to guide the understanding of how the “Big Five” and the coordinating mechanisms may differ in relation with the team mature. However, it seems that during the initial stages of team development, team leadership and team orientation will play a large role in teamwork, as teams begin to explore their task interrelationships and the roles for which each member is responsible. Team leadership is important during this stage of team development, because the leader will need to set initial performance expectations and specify the members’ roles and responsibilities. Team orientation will also be needed during the initial team formation, in order to overcome the early hurdles of learning the strengths and challenges of each team member and the members’ preferences of how tasks are completed.

When the initial stage will be set, team members can then focus on becoming more proficient in performing their individual tasks and can begin to spend more time monitoring others’ behaviors and providing backup behaviors.

The largest amount of empirical evidence related to team processes, throughout team development focused on communication. Empirical support by George and Dudek (1974) has also shown that the lack of communication during the initial stages of team development can have a detrimental effect on team performance.

Communication during this stage may be used to learn to anticipate each other’s needs, through nonverbal cues and through establishing norms for communication. This is further supported by studies examining specific aspects of communication, which found that more experienced teams communicate less than did inexperienced ones. These studies suggest that over time, teams appear to develop a common vocabulary that will reduce the length of the message (Obermayer et al., 1974).

Additionally, research has found that teams that take time to strategize before engaging in a more complex team task, have better performance than those that do not, suggesting that communication may be one of the more important team processes in the initial stages of performance.

Once the team progresses to the performance stage of the task in which the team is actively pursuing the team objectives, performance monitoring, backup behaviors, and adaptability are expected to increase in importance. As the team engaged in performing the team task, there is greater susceptibility to errors and the need to remain vigilant.

When teams complete the tasks, team members progress into a transition phase in which they reevaluate their performance, provide and receive feedback, and make adjustments to their strategies as needed (Marks et al., 2000).

In this stage, teams will require team leadership to provide additional guidance and feedback. Members' team orientation will play a role in receiving and using performance feedback from the team leader and other team members. This is a particularly important phase in team performance, as the team is able to develop prescriptions for future performance cycles (Marks et al. 2000). This series of performance and transition phases repeats until the team completes its task.

### **2.2.9. How to Promote Teamwork**

There are three basics strategies by which effective teamwork can be achieved.

- First, specific individuals, who have the correct KSAs (**K**nowledge – **S**kills – **A**ttitudes), can be selected to participate in a team or to perform team-based work (Klimoski & Mohammed 1994). This strategy requires precise measurement of individual-level team competencies and a correct balancing of task-oriented and team-oriented KSAs among team members.
- Second, teamwork can be enhanced by modifying tasks, work flow, or structure (Campion et al., 1996). In other words, one can examine the environmental conditions in which team-based work occurs and reengineer these conditions accordingly.
- Third, individual team member competencies can be developed through training (Leonard et al., 2004).

Team training has been the most widely applied strategy to improve team performance. Team training is defined as applying a set of instructional strategies that rely on well-tested tools (e.g., simulators, lectures, videos) (Salas et al., 2000).

The effective team training reflects general principles of learning theory, presents information about requisite team behaviors, affords team members the opportunity to

practice the skills they are learning, and provides remedial feedback. A great deal of research has been devoted to the most effective strategies and techniques for training specific team KSAs. A comprehensive review of this research has presented an extensive collection of principles and guidelines concerning the design and delivery of team training.

#### **2.2.10. Key dimensions of inter-professional teamwork.**

Interprofessional teamwork is an activity which is based on a number of key dimensions. These include: clear team goals, a shared team identity, shared team commitment, role clarity, interdependence and integration between team members.

Drawing on a study of primary care teams, (West & Slater 1996) have usefully extended thinking about the key dimensions of interprofessional teamwork. They found that team members consider a number of additional elements of teamwork as being important. These elements are the following:

- Democratic approaches
- Efforts to breakdown stereotypes and barriers
- Regular time to develop Team working away from practice
- Good communication
- A single shared work location
- Mutual role understanding
- The development of joint protocols, training and work practices
- Agreed practice priorities across professional boundaries
- Regular and effective team meetings
- Team members valuing and respecting each other
- Good performance management.

Although there isn't a strong body of high quality, empirical evidence that confirms how these different elements – individually or collectively – affect interprofessional teamwork, the dimensions listed above provide a useful reminder of the complex and multifaceted nature of this form of interaction (Reeves et al. 2009).

In a discussion of these challenges, the UK Audit Commission has pointed out that, separate lines of control, different payment systems leading to suspicion over motives, diverse objectives, professional barriers and perceived inequalities in status, all play a

part in limiting the potential of multi-professional, multi-agency teamwork. For those working under such circumstances efficient teamwork remains elusive.

### **2.3. Teamwork in health care sector**

In this chapter the fundamental elements, as well as the particularities of the team working in the healthcare sector, are presented. Health care has not always been recognized as a professional sector in which the promotion and the support of the team work, have deep roots in its members' culture, at the meaning of all the above mentioned theory and as we have recently come to think on it.

#### **2.3.1 Historical review**

In the “good old days,” people were cared for by one all-knowing doctor who lived in the community, visited the home, and was available to attend their needs at any time of day or night. If nursing care was needed, this was often provided by the family members, or in the case of a reach family, by a private-duty nurse who “lived in.”

Although this roughly corresponds to some elements of teamwork, the health care has changed enormously since then and the pace has quickened even more dramatically in the past 20 years. The rapidity of change will continue to accelerate, as both clinicians and patients, integrate new technologies into their management of wellness, illness, and complicated aging.

The clinician operating in isolation is now seen as undesirable in health care, because an alone individual who works long and hard to provide the care needed by the patients might put them at risk.

A driving force behind health care, transformed practitioners from being “soloists” to members of an “orchestra”, which is the complexity of the modern health care. The U.S. National Guideline Clearinghouse now lists over 2.700 clinical practice guidelines and every year, the results of more than 25.000 new clinical trials are published. Obviously, no single person can absorb and use all this information. The typical Medicare beneficiary visits two primary care clinicians and five specialists per year, as well as providers of diagnostic, pharmacy, and other services. This figure is several times larger for people with multiple chronic conditions. The implication of these dynamics is enormous. By one estimate, primary care physicians caring for Medicare patients are linked in the care of their patients to, on average, 229 other physicians yearly to say

nothing of the vital relationships between physicians, nurses, physician assistants, advanced practice nurses, pharmacists, social workers, dieticians, technicians, administrators, and many more members of the team. With the geometric rise in complexity in health care, which shows no signs of Medicare beneficiary the number of connections among health care providers and patients will likely continue to increase and become more complicated. Given this complexity of information and interpersonal connections, it is not only difficult for one clinician to provide care in isolation but also potentially harmful.

As multiple clinicians provide care to the same patient or family, clinicians become a team a group working with at least one common aim, which is the best possible care whether or not they acknowledge this fact. Each clinician relies upon information and action from other members of the team. Yet, without explicit acknowledgment and purposeful cultivation of the team, systematic inefficiencies and errors cannot be addressed and prevented. Now, more than ever, there is an obligation to strive for perfection in the science and practice of interprofessional team-based health care (Mitchell et al., 2012).

A document published by the Canadian Health Services Research Foundation (2006) states that, a healthcare system which supports effective teamwork can improve the quality of patient care, enhance patient safety, and reduce workloads that cause burnout among healthcare professionals.

Physicians, nurses, pharmacists, technicians, and other health care professionals, must coordinate their activities to make patient care safe and efficient. Health care workers perform interdependent tasks, while functioning in specific roles and sharing the common goals of quality and safety in care.

There has been a growing support for the use of interprofessional teamwork across health and social care organizations. This support can be seen in the numerous papers and documents which argue that interprofessional teamwork is an essential ingredient for reducing duplication of effort, improving coordination, enhancing safety and, therefore, delivering high quality care (Onyett, 2003). Furthermore, Eichorn (1974) offers an early argument for why interprofessional teams are needed in the delivery of care, supporting that, health and social care problems have become defined in complex and multi-faceted terms. So health organizations have discovered it is necessary to have the information and skills of many disciplines in order to develop valid solutions and

deliver comprehensive care to individuals and families. This view was reiterated more recently by Firth-Cozens (1998) who has argued that, Teamworking is seen as a way to tackle the potential fragmentation of care, a means to widen skills, an essential part of the need to consider the complexity of modern care and last but not least a way to generally improve quality for the patient.

Similar sentiments can be found in a range of national government policies (Health Council of Canada 2009), in the documents and policies of professional regulatory bodies (Association of American Medical Colleges 2009) and international agencies (e.g. World Health Organization 1988), as well as the National Health Service Management Executive (1993) in the UK. The last pointed out that, the best and most cost-effective outcomes for patients and clients are achieved when professionals work together, learn together, engage in clinical audit of outcomes together, and generate innovation to ensure progress in practice and service.

### **2.3.2. Education and training of healthcare professionals**

To ensure effective interprofessional team performance, team members require a comprehensive understanding of their own professional roles and the roles of their colleagues.

Professionals tend to lack skills to work as an effective team member and collaborative attitudes, as traditionally teamwork has not been included in any of their pre- or post-qualification training (Reeves, 2008).

There is an assumption that professionals will intuitively know how to work collaboratively. While, evidence related to continued failures in communication and collaboration across health care systems remind us, that this is not the case. Furthermore, there is a pressing need for professionals to be able to collaborate in an effective interprofessional manner. As a result, health and social care education providers have been increasingly offering pre- and post-qualification programs, modules and workshops, which aim to provide students and practicing professionals with a range of attributes to help them understand the principles of teamwork and collaboration as well as be able to perform effectively in an interprofessional team (Barr et al., 2005).

A number of professional regulatory bodies have stressed the need for educational providers to design and deliver a range of interprofessional learning experiences (e.g. General Medical Council 2001, Nursing and Midwifery Council 2002).

Moreover, there has been a growth in the development of “benchmark statements” and competency frameworks to ensure that learners develop the appropriate knowledge attitudes and skills of teamwork (Quality Assurance Agency for Higher Education 2009).

On the other hand, came up through discussions on how teamwork and collaboration attributes can be appropriately assessed and measured. Although it is known that, the use of competency-based approaches can be problematic, as they can fail to capture the essence of working in an interprofessional manner (Reeves et al., 2009).

There can also be other difficulties linked to the use of interprofessional competencies. The Royal College of Physicians and Surgeons of Canada (2005) for example, require physicians to develop competences to collaborate as team members as well as competencies to be the leaders of interprofessional teams.

Janet Finch, in a presentation at the Millennium Festival of Medicine in London 6-10 November 2000, highlighted that there will be new joint training across the professions in communication skills. So, a new common foundation program is put in place, to enable students and staff to switch careers and training paths more easily. She also believes that it is important that the NHS should work with higher education providers and accreditation bodies, in order to develop education and training arrangements, which are genuinely multi-professional and which will enable students to transfer readily between courses.

### ***Clarity about definitions***

The Educational Institutions can deliver what the health service wants, only if there is a clear statement of objectives, which at present is lacking. Without a clear definition of the desired “interprofessional” working practices, higher education cannot develop the pedagogical approaches which underpin it.

The NHS wants students to be prepared for interprofessional working in any or all of the following senses:

- To “know about” the roles of other professional groups

- To be able to “work with” other professionals, in the context of a team where each member has a clearly defined role
- To be able to “substitute for” roles traditionally played by other professionals, when circumstances suggest that this would be more effective
- To provide flexibility in career routes, “moving across.”

### ***Knowing about***

Most discussions of interprofessional education begin by acknowledging the historical divide between different occupational groups: “old fashioned demarcations between staff” as the NHS Plan puts it. The first step to overcoming these divides is seen as greater mutual knowledge and understanding. This is the framework adopted by the Centre for the Advancement of Interprofessional Education, which in its statement, focused on the ways professions learn with and about each other, foster mutual respect, leading to overcome obstacles to collaboration.”

Recent statements from the General Medical Council (GMC) also advocate that, Interprofessional collaboration/ training can encourage professionals in training to learn from and about each other, encourage respect for the contribution each professional has to make to patient care, leading to mutual understanding of professional systems, cultures and roles. This has a particular resonance for medicine, the profession that historically has policed these demarcation disputes most effectively to its own advantage.

### ***Working with***

The value of working actively with other professionals, as part of a single care team, is well embedded in discussions of effective health care.

Sir Charles George has described team working as an “essential prerequisite to modern clinical care” and in the GMC’s guidance on maintaining good medical practice one of the key tests of a good team, is that members can be open and honest about professional performance both together and separately.

Education and training can contribute to this endeavor in many ways, both before and after registration. Universities have found that there are some problems of funding and of coordinating the professional requirements of different groups into a single training

program. From a university perspective, the barriers to shared learning at the pre-registration stage are considerable and they are summarized below:

- Accrediting bodies have different requirements, which may be very difficult to integrate
- Lengths of program differ
- Entry level requirements are widely varied
- In many cases, there would need to be cooperation between different universities, because very few institutions provide for medicine, nursing, and all the therapies
- There are problems in timetabling shared learning, even within a single institution, given other course requirements which have to be met.

It is not impossible to overcome these barriers, but the fact that experimentation has been limited indicates the level of difficulty. If this were to be pursued on a wide scale, it would be costly and would require considerable change for example, on the part of professional bodies. There is also the fundamental question of whether shared learning is the most effective learning for each of the professional groups. Recent research in Dundee, on limited shared learning between medical students and midwifery students, suggests that this may not be so. Even though the groups had gained in mutual tolerance and understanding, effective learning for each of the groups may have been compromised.

Health services have to redesign around the needs and concerns of patients, to end the “demarcation lines,” especially those between doctors and other health professionals. According to DoH 2000 in England “For the first time, nurses and other health professionals will be given the bigger roles that their qualifications and expertise deserve. The Plan envisages a major role for education in this task of ‘breaking down the barriers’....Radical reform is required in NHS education and training to reshape care around the patient.” This will include some common training programs, plus the development of training that will enable non-medical professional groups to undertake new tasks. For example, midwives moving into public health, nurses prescribing certain drugs and pharmacists developing a comprehensive community service.

In this definition of interprofessionalism, it is clear that the first big challenges are to working practices within the NHS itself, because education cannot lead these changes its own. Providing common modules on issues such as communication skills is

relatively manageable, but supporting the more radical changes is a substantial challenge, involving major curriculum redesign and possibly an overhaul of program provision. However one of the main questions is if doctors simply give up the monopoly of some of their roles and/or are they themselves to take on new roles, hitherto at the borderline of other health professions. Clearly major changes in the medical curriculum would be a matter for the GMC, but when planning a new medical school one is inevitably thinking long term.

Recent English NHS documents emphasize interprofessionalism as “moving across” in career terms. The aim is to facilitate movement from a career in one health profession to another, during the course of training and afterwards. This model presumes that educational routes to different professional qualifications will remain distinct, at least in their later stages, but that it will be much easier to move between these routes without having to start from the beginning (Millennium Festival of Medicine, Keele University 2000).

### **2.3.3. The concept of team in healthcare sector**

While not all health professionals work in teams, health professionals’ perception as to whether or not they belong to a team varies despite the perceptions of others.

In some cases healthcare professionals see themselves as working in uni-professional teams (for example, a nursing team), while others see themselves working in institutionally based teams (such as a stroke team comprised of a range of professions). In addition, individuals receiving care may have their own perception of their healthcare team based on the health professionals they receive care from.

In healthcare, the most common types of teams are:

- Project teams (for example, quality improvement teams)
- Care delivery teams and management teams,

However, these teams can be subdivided according to:

- Patient population (such as geriatric teams)
- Disease type (such as stroke teams)
- Care delivery settings (such as primary care, hospital, and long-term care).

The team members mainly have the following characteristics:

- Are mutually dependent
- See themselves as working collaboratively for patient-centered care
- Benefit from working collaboratively to provide patient care
- Share information which may lead to shared decision-making
- Know when teamwork should be used to optimize patient-centred care

(Poulton, 2003)

A wide range of collaboration can occur depending on the type of care required. Generally, higher levels of collaboration are needed when health needs are complex and individuals receiving care require the skills of several health professionals.

Collaboration among health professionals is dynamic and occurs within a spectrum from:

- Independent parallel practice with autonomous health professionals working side by side.  
To
- Consultation and referral where health professionals exchange information.  
To
- Interdependent co-provision of care with interdependent decision-making

(Way et al., 2001)

#### **2.3.4. The Contribution of Teamwork in Healthcare**

The range of different countries reporting inter-professional teamwork activities has rapidly increased in recent years. In addition to countries with a long track record of teamwork initiatives, such as Australia, Canada, the UK and the US, a number of other countries, including Brazil, China, New Zealand, Spain, Sweden and The Gambia, are also reporting the use of inter-professional teamwork across a number of clinical contexts.

Team working in healthcare may affect the following factors:

### ***Improving the Quality and safety***

Improving the quality and safety of care has been a key driver for the use of inter-professional teamwork, since the need for effective collaboration and communication is seen as central for achieving such gains.

Arguably, the focus on delivering a quality service is linked with the patient centered movement and consumerisation, as well as the emergence of a QI index, which is related to the quality improvement initiatives.

A small number of studies have indicated that inter-professional teamwork can contribute to improve quality in the areas of reducing patient complaints, increasing patient satisfaction and reducing stress and burnout among professions (Wofford et al., 2004).

In relation to safety, concerns can be traced back to Ivan Illich's (1977) book entitled, *Limits to Medicine*, in which he argued that the medicalization of society caused more harm than good, and often rendered many people, in effect, lifelong patients. Through the use of a range of health statistics Illich demonstrated the extent of postoperative side-effects and drug-induced illness, which he termed iatrogenic – physician-induced – disease.

The publication in 2000 of the Institute of Medicine's (IoM) report, *To Err is Human*, was a major driver of both public and professional interest in safety and the reduction of error (Kohn et al., 2000). Based on data from US medical record studies dating back to 1984, the report found that there were between 44.000 to 98.000 adverse events reported each year. The IoM report went on to state, in order to identify error each team member needed to know their own responsibilities, as well as those of their members. Additionally the IoM report went on to recommend that health and social care organizations should begin to implement patient safety programs that trained professionals to work effectively together in teams.

### ***Patient- centered care***

According to Jewson (1976) in his paper on the "disappearance of the sick man", the care in the 1700s was patient centered. Physicians, he argued, at that time were very responsive to the needs of their usually rich patrons. However, towards the end of that century, this relationship altered. The production of medical knowledge was assumed

by medical investigators. This changed the practice of medicine from being negotiated between physician and patient to a consensus of opinion imposed from the growing community of publically funded medical researchers.

The modern notion of “patient-centered care” was introduced into the health literature in the middle of 1950s by Balint, who compared it to “illness-centered medicine” (Brown, 1999). The concept emerged from the “paradigm of holism”, which suggests that people need to be seen in their bio-psychosocial entirety and focuses on the attention of health care providers on patients' individual identities (Beach et al., 2006).

The main features of patientcenteredness include health and social care providers sharing control of consultations, decisions about interventions or the management of the health problems with their patients and a focus in consultations on the patient as a person, rather than solely on the disease (Lewin et al., 2001).

This may involve shared decision-making to develop a treatment plan, listening to patient’s experience of illness and forming a patient-doctor relationship based on empathy and care.

There is a growing literature arguing for the adoption of patient-centered care in the delivery of health and social care services (Amey et al., 2006). The inclusion of the patient in the care process is viewed as important; since it allows professionals to tailor their care to respond to the different needs of different individuals. As the UK Nursing and Midwifery Council (2002) stated that, patients and clients are equal partners in their care and therefore have the right to be involved in the health care team's decisions.

More recently, the term patient-centered care has come to embrace a collaborative, team based, approach. The focus has expanded to include all health and social care professionals working together, with the patients at the center, to improve the quality of the services they deliver (Dean, 2008).

By including patients as part of the team, this approach assumes they can be given the opportunity to increase their knowledge of their care. It also provides opportunities for professionals to increase their knowledge of the patient and their individual health and social care needs. In addition, it has been argued that a patient-centered team approach could act as a method of disease prevention and may also allow for the patient to recover in a positive environment (Dean, 2008).

### **2.3.5. Factors related to effectiveness in healthcare**

Teamwork is essential in the provision of healthcare. The division of labor among medical, nursing and allied health practitioners means that no single professional can deliver a complete episode of healthcare. However, there is little formal training in teamwork skill development, in both undergraduate and postgraduate health professional education programs. Nevertheless, teamwork skills are largely learned 'on-the-job' (Wake-Dyster, 2001).

Although many studies have identified teamwork as a requirement for high quality, safe patient care, within healthcare we have limited understanding of how individual health professionals contribute to effective teamwork. There has been little research into the educational and training needs of health care professionals to enhance their participation in work place teams; healthcare team members do not understand the personal competencies required for team success (Dubnicki et al., 1991).

Planning formal education programs first of all it is necessary to identify the competencies held by healthcare professionals that were perceived by health service management colleagues to enhance team- work. It has been suggested that each team member's abilities, skills experience, attitudes, values, role perceptions and personality, are the elements making a person unique. Determine what they are willing and able to contribute, their level of motivation, methods of interaction with other group members and degree of acceptance of group norms and the organization's goals (Cole, 2001).

This suggests the need to focus on individual characteristics that have been found to contribute to team work, as "pre-requisite characteristics of effective teamwork". Health professional education has had a long history and is stressed in the accreditation of health care management education programs worldwide (Robbins, 2001).

In addition, there is increasing evidence that management competencies are an important source of competitive advantage for organizations (Lado et al., 1992). Another investigation of health service managers in the State of Victoria, Australia demonstrated that the type of team influences the factors related to effectiveness.

As well as in healthcare settings there are perceived differences in the competencies important for management and clinical teams.

### ***Management team competencies***

The management team competencies were strongly consistent with previous studies on teamwork performance. Three motives received the highest ranking of all the skills, knowledge, traits and motives. These are the commitment to working collaboratively (64.1%), the commitment to a quality outcome (69.2%) and the commitment to organization (64.6%).

Although has not unequivocally supported through controlled experimental design, cross-sectional and case studies have suggested that teams with a climate of psychological safety, that encourages high levels of participation, toward clear goals, that enable high performance and quality expectations, demonstrate better team performance. The respondents in this study consistently identified three motives that reflected these previous findings.

This study focused on the perceptions of healthcare managers of individual characteristics that contributed most to team success, and yet the results still supported previous study. From the perspective of these respondent managers, individuals participating in management teams in health care organizations were considered to have the greatest impact on team performance, when they demonstrated commitment to working collaboratively, commitment to the organization and commitment to a quality outcome.

Of all of the skills, knowledge, traits and motives that were provided, the fact that over 60% of the management team respondents indicated the importance of these three motives lends strong support for team members, who have the following characteristics and potential:

- Demonstrate their commitment to the organization by communicating organizational goals and objectives and assisting their team colleagues to translate the needs of the organization, into performance outcomes for the team,
- Demonstrate their commitment to collaboration and quality by facilitating the needed psychological safety among team members that

enables them to discuss and learn from mistakes and to challenge their team colleagues when it is required for a quality outcome.

While progressive human resource management promotes participation, training and teamwork consistent with the identified management competencies, healthcare organizations do not always provide best practice HRM and the people side of management has often been ignored in the pursuit of health reform.

In addition the traditional training and socialization of health professionals tends to emphasize individual skills, accountability and achievement. The healthcare system continues to foster individual and discipline-specific rewards, supervision and education which consistently lead to difficulties with collaboration across professions and reliance on hierarchy to manage coordination needs and mediate conflict.

The strong support for leadership skills among management team members in this study holds up the notion that, within healthcare leadership who rests at the top of an authority hierarchy needs to be refocused to develop leaders throughout the organization. There needs to be a radical shift in HRM practice in healthcare to train, performance manage and reward practices that result in clinical and management leaders through the organization. Leaders that can foster the organizational commitment and psychological safety that is likely to improve teamwork outcomes.

In healthcare, employee relationships and behaviors are often influenced by the highly professional nature of the workforce, where there is often stronger alliance to the profession than to the organization. Many managers are professionally trained clinicians and they often continue clinical practice even when they have assumed a management role. The findings of this study reinforce previous research that has identified the need for management training of clinician leaders.

Although many of the competencies developed in clinical education and ongoing clinical practice are transferable to management, there are skill and knowledge deficits. However, the transition from clinician to manager requires a substantial cognitive shift from a primary commitment to individual care to a community/organizational focus. It is also highlighted that differences in

perceptions among male and female health service managers could influence team behaviors and ultimately team effectiveness. The differences noted in the responses of the male and female managers appear consistent with previous studies. For example, male leaders have been found to be “more transactional” and derive their power from their position on the formal organizational structure. In contrast, women tend to be “more transformational” and derive their power from personal characteristics. Furthermore, the male respondents demonstrated this transactional nature identifying ability to influence as a key teamwork skill, while the female respondents suggested negotiation, self-awareness of strengths and weaknesses, as well as positive attitude were important.

Different levels of health service managers require different competencies. It has been suggested that front line and/or entry level positions rely on technical expertise, middle managers require greater skills in human resource management and the senior level roles need greater conceptual skills. Often the senior roles are thought to focus more on managing output related organizational adaptation and change, while junior levels manage the technical operational aspects of the organization. The findings provided some support. The CEO respondents were more likely to stress commitment to the organization and less likely to indicate task completion. The senior and middle managers focused more on transactional skills, such as negotiation and these manager respondents also stressed self-directed learning to a greater extent (Leggat, 2007).

#### **2.3.6. Characteristics of effective teamwork in Healthcare sector**

Although the characteristics and the main dimensions of the effective teamwork have been comprehensively examined in the teamwork chapter, in the following paragraphs some of them will be presented again, in terms of the healthcare particularities.

##### ***Organizational structure***

Many theories offer recommendations about the structural characteristics of the teamwork in healthcare institutions, by referring to relatively stable procedures of coordination and control. Seven of the most commonly described structural characteristics include, a clear purpose, appropriate culture, specified task, distinct roles,

suitable leadership, relevant members, and adequate resources. They will be described in turn below.

### ***Clear purpose***

West (1994) emphasized the need for organizations to have a clear vision, which encompassed their underlying values. Mission statements communicated and synchronized these shared values across the organization, thus engaging and motivating individuals. As team members participated in setting and prioritizing goals, they better understood the task requirements and were more motivated to achieve them. For instance, goal agreement in healthcare is often achieved through a common commitment to patients' needs (Headrick et al. 1998). Having a super ordinate goal beyond professional goals motivates team members to emphasize their similarities without diluting unique professional contributions (Loxley, 1997).

### ***Appropriate culture***

Teams should be recognized and integrated within their organizations and organizations need to clearly define their expectations and mechanisms of accountability for all teams (Sundstrom et al., 1990). Organizational culture needs to transform shared values into behavioral norms. For example, team success is fostered by a culture that incorporates shared experiences of success. In times of economic rationalism, there may be cultural conflict and inconsistency between norms of maintaining clinical standards and adhering to the healthcare organization's mission (Firth Cozens, 1998).

### ***Specified task***

Teams require tasks that make a tangible contribution to the organization and are consistent with the team's purpose, abilities and attitudes. Tasks need to be sufficiently motivating for team members to share responsibility and accountability for achievement. Healthcare teams need to clearly define the specific aspect of complex and inter-related patient care which they address (Firth-Cozens 1998).

### ***Distinct roles***

Within a team, individual roles need to be clarified and understood by all. However, role construction can be influenced by personal expectations, and by organizational and interpersonal factors. Therefore, roles need to be flexible enough to accommodate individual differences, personal development needs and membership changes (Blechert

et al., 1987). Ideally, individuals should be able to negotiate their roles to perform unique and meaningful tasks and team roles should be interchangeable. However, many healthcare team members are unable to choose with whom they work and professional specialization limits the transferability of roles (Headrick et al., 1998).

### ***Suitable leadership***

Leadership should reflect the team's stage of development. Leaders need to maintain a strategic focus to support the organization's vision, facilitate goal setting, educate, and evaluate achievements (Freeman & Miller 1998). Traditionally, doctors have been accorded and have assumed leadership of healthcare teams, regardless of their competence. However, new roles for healthcare leaders are emerging that incorporate team development, in order to maintain clinical productivity and patient satisfaction (Carr, 1995). Kane (1975) suggested that leadership should be allocated to the team member with the most expertise, rather than being linked to professional groups.

### ***Relevant members***

Teams require the right number of members with the appropriate mix and diversity of task and interpersonal skills. A balance between homogeneity and heterogeneity of members' skills, interests and backgrounds is preferred. Homogenous teams are composed of similar individuals who complete tasks efficiently with minimal conflict. On the other hand, heterogeneous teams incorporate membership diversity and therefore facilitate innovation and problem solving (Hackman, 1990). Healthcare teams are often large, due to norms of professional representation, regardless of contribution to patient care. Further, it is often unclear as to whether patients and their families are team members (Maple, 1987).

### ***Adequate resources***

Organizations need to provide teams with adequate financial resources, administrative and technical support, as well as professional education. A safe physical environment where team members work in close proximity to each other can promote communication and cohesion (Sundstrom et al., 1990). Clinical care often takes precedence over professional education during economic scarcity. Healthcare professionals seldom prioritize training that is not directly related to their clinical setting, despite wanting to become skilled in teamwork (Loxley, 1997).

### ***Individual Contribution***

Establishing and managing relationships between individuals who have a variety of personalities and a range of professional and non-professional experiences, is a critical component of teamwork. At a minimum, individual participation in teams requires self-knowledge, trust, commitment and flexibility. Below these four dimensions are briefly analyzed, in terms of healthcare sector.

### ***Self-knowledge***

Each individual brings to the team a unique personality and position, which reciprocally affects team function (Maple, 1987). In healthcare environments, Horwitz (1970) described four images that each individual contributes to a team. These are the personal and professional self-image, the professional expectations, the understanding of colleagues' skills and responsibilities and the perception of colleagues' images of the individual. Comparing these four images, Maple suggested that the professional's self-image was the most influential in team members understanding and interacting with each other.

### ***Trust***

The ability to trust originates from self-knowledge and competence. Trust must be slowly built up across team members who have different competencies, assumptions and priorities, through developing confidence in each other's competence and reliability. Trusting individuals are willing to share their knowledge and skills without fear of being diminished or exploited. They often have an increased capacity for individual learning. Incorporated with trust is respect for another's skills and expertise (Loxley, 1997). To develop respect, healthcare professionals need to discuss openly any similarities and differences in their professional values and standards.

### ***Commitment***

Self-knowledge and an ability to trust others are the building blocks of commitment. Commitment to a unified set of team goals and values provides direction and motivation for individual members. Further, commitment is increased by and increases feelings of responsibility for and participation in the teams work. Goleman (1998) emphasized that committed individuals were willing to make short term personal sacrifices, believing that they could generate a greater good. In addition, high levels of commitment enabled

individuals to thrive amongst challenges and pressures that may otherwise be perceived as stressful. Healthcare teams generate commitment through a shared goal of comprehensive patient care and a common belief that the team is the best way to deliver this coordinated care (Freeman & Miller 1998).

### ***Flexibility***

Flexibility is the ability to maintain an open attitude, accommodate different personal values and be receptive to the ideas of others. Flexibility requires honesty, self-knowledge, reflection and regulation. Without understanding the diversity of personal and professional values, individuals risk judging others according to their own value systems. In healthcare teams, individuals need to accept role overlap and be supportive in assisting colleagues to meet patients' needs (Bassoff 1983). Further, professional values, identity and frames of reference often require renegotiation in response to policy and resource changes (Loxley, 1997).

### ***Team processes***

Team processes describe subtle aspects of interaction and patterns of organization that transform input into output. It is known from the teamwork chapter, that the team processes are usually described in terms of the following seven characteristics. Coordination, Communication, Cohesion, Decision making, Conflict management, Social relationships and Performance feedback. In this paragraph, the above mentioned seven characteristics are summarized again, as the outcome of relative health care teamwork studies, in terms of team process implementation by the health care institutions, as well as in the view of the existing particularities in the healthcare sector.

### ***Coordination***

Coordination is described as the orderly interpersonal actions required to perform complex tasks. Healthcare teams need to harness the variety and minimize the differences of their members, in order to ensure that expert skills and knowledge are well utilized, achieving the patient-centered targets. Throughout a team's development and evolution, its coordination needs will vary. However, a shared understanding of the team's purpose and culture facilitates coordination as team members accept the costs and recognize the benefits of teamwork (Loxley, 1997).

### ***Communication***

Communication involves an observable interchange of information and subtle interactions of power, attitudes and values. As a major form of communication, meetings need to have clear agendas, and be managed so that all members contribute (Loxley, 1997). In addition, clear two-way communication channels across team boundaries and with the organization ensure the relevance of the team's functioning (Firth-Cozens, 1998). The above are consisted fundamental elements for successful communication, which is required for the effective teamwork, within the demanding environment of the health care institutions.

### ***Cohesion***

Team cohesion acknowledges members' personal attraction to the team and the task. Members cooperate interdependently around the team's task in order to meet team goals (Pearce & Ravlin, 1987). Socially, members feel as if they belong and want to remain with the team for future tasks. Cohesion can be fostered through small team sizes, similar attitudes and physical proximity. It also increases with accurate performance feedback, success in adversity, good communication and conformity to norms (Husting, 1996).

### ***Decision making***

A broad range of members' knowledge and skills usually contributes expanded information and generates more legitimate decisions. However, individual autonomy may decrease as decisions are shared and responsibility diffused to all team members (Kirkman & Rosen, 1999). When team members were fully informed and participated in decisions, they were more committed and productive. Nevertheless, it is pointed out that, team decision making can be problematic in healthcare environments when doctors' opinions are rewarded very differently from those of other team members (Firth-Cozens, 1998).

### ***Conflict management***

Team conflict can source both creativity and destruction. For teams to value creative contributions and promote effective problem solving, diversity needs careful management. Destructive team conflict often has an interpersonal basis in work role or organizational factors. Conflict emerges in healthcare teams when the value and

intention of other team members is perceived solely in terms of the professional's own frame of reference (Loxley, 1997). Therefore, teams need mediation strategies to manage conflict and avoid its destructive interference (Firth-Cozens 1998). In healthcare teams, professional assumptions and differences need to be openly acknowledged and negotiated around a patient focus to limit interpersonal conflict (Maple, 1987).

### ***Social relationships***

Good social relationships maintain effective teams. Personally, team members who are empathic and supportive of their colleagues offer practical assistance, share information and collaboratively solve problems. Social networks within and beyond teams also enhance individuals' access to strategic information; facilitate a better understanding of team tasks and an increased belief in the team's effectiveness. (Kirkman & Rosen 1999) (150) A major risk in healthcare teams arises from caring for patients who have significant physical and emotional needs. This work is emotionally complex and taxing for all team members and needs careful management to prevent individual burnout and patient objectification (Hackman, 1990).

### ***Performance Feedback***

Individuals, the team and the organization all require accurate and timely feedback about the team's performance in order to maintain their effectiveness. Hackman (1990) recommended balancing the more traditional individual reward systems with team-based incentives that are contingent upon the whole team's performance, and emphasize co-operation, rather than competition. Traditional individual feedback and reward systems in healthcare are very unequal, because of inherent status differences between professionals. Team based feedback, such as clinical audits, are an alternative method of determining team achievements (Firth-Cozens, 1998).

### **2.3.7. Teamwork and High-Reliability Organizations**

Organizations are increasingly becoming dynamic and unstable. This evolution has given rise to greater reliance on teams and increased complexity in terms of team composition, skills required, and degree of risk involved. High reliability organizations (HROs) are those that exist in such hazardous environments where the consequences of errors are high, but the occurrence of error is extremely low.

Safety is a fundamental patient right, though not a certainty. When patients arrive at a health care organization, they expect to leave that institution in equal or better health. Patients and their families do not expect physicians, nurses, and other hospital staff to make mistakes, or worse yet cover up as opposed to communicate errors. The publication of “To Err Is Human by the Institution of Medicine” (IOM) highlighted the fact that the delivery of care is not error free. The report concluded that medical errors cause up to 98,000 deaths annually. The IOM report brought national focus to this important issue and has since spawned significant research on the causes of medical errors and the effectiveness of different strategies for making health care a more reliable system (Kohn et al., 2000). (119)

The IOM issued a number of recommendations designed to move health care institutions toward high reliability. HROs are institutions that operate in complex, hazardous environments making few mistakes (i.e., medical errors) over long periods of time. Recommendations related to voluntary error reporting, systems changes, safety systems design, and standards for health care professionals.

The IOM also pointed toward the need for enhanced teamwork. Historically physicians, nurses, and other health care professionals have functioned as discrete parts. The IOM recommended that interdisciplinary team training programs be established, based on sound principles of team management, to improve coordination and communication among health care staff (Kohn et al., 2000).

The “Agency for Healthcare Research and Quality” (AHRQ) is the lead federal agency in supporting and implementing the recommendations of the IOM in its effort to reduce medical error and improve patient safety. AHRQ’s goal is to create high-reliability health care organizations. In support of that goal, AHRQ launched Team Strategies and Tools to Enhance Performance and Patient Safety (TeamSTEPPS) during 2006 and distributed this team training curriculum to members of the HRO network (Alonso et al., 2006).

The concept of HROs has been around for more than 20 years, but has only recently begun to take hold in health care with the publication of To Err Is Human and AHRQ’s patient safety agenda.

In the below paragraphs the fundamental features of teamwork and the critical characteristics of HROs are compared, demonstrating how these characteristics are interwoven, as well as how and why the HRO environment demands teamwork.

### ***Hypercomplexity***

Hyper-complexity is defined as an extreme variety of components, systems, and levels, each one having their own standard procedures, training routines, and command hierarchy (Roberts & Rousseau 1989). The delivery of health care occurs in a hyper-complex environment that is dependent on multi-team systems. Even though health care workers have historically operated in distinct silos and have been trained in separate professions and possess distinct expertise, these individual must coordinate to deliver safe care. Based on the above, the successful performance in hyper-complex environments relies upon multi team systems and teamwork is an essential component of such environments.

### ***Tight coupling***

Tight coupling is defined as reciprocal interdependence across many units and levels. Tight coupling relates to task interdependence, which is the defining characteristic of teams. That is, tasks performed by one member of the team are dependent on tasks performed by other members of the team and the performance of these tasks must be coordinated among team members, for effective team performance (delivery of safe care).

### ***Extreme hierarchical differentiation***

Extreme hierarchical differentiation is defined as an organizational structure in which levels and roles are clearly differentiated. This characteristic is also true of most healthcare teams. Physicians tend to be at the top of this hierarchy with the case or treatment resulting from their directions. Therefore, a great deal of coordination is necessary to keep physicians, nurses, and technicians working together as a cohesive unit. Unfortunately hierarchy often makes it more difficult for medical teams to achieve this level of coordination and cohesiveness.

Although most medical teams are hierarchical, high-reliability teams trained in teamwork exhibit characteristics such as assertiveness and mutual trust, which reduce the negative effects of hierarchy

### ***Many decision makers***

Another key characteristic of HROs is that they contain “many decision makers” working in complex communication networks (Roberts & Rousseau 1989). These characteristic personifies most health care teams.

Most teams in health care are comprised of four to six unique individuals; however, decisions are not always unanimous.

As different team members are trained separately in their respective professions (e.g., medical school and nursing school), they have learned to communicate differently and have varying styles of conveying information depending on their role.

Fortunately, new and emerging techniques like the Situation Background Assessment Recommendation (SBAR) strategy have been used in health care to overcome such communication difficulties with positive results (Leonard et al., 2004).

### ***High degree of accountability***

A high degree of accountability in HROs is characterized by the severe consequences that can result from errors (Roberts & Rousseau 1989). Although severe consequences may be characteristic of all teams (e.g., project teams), in health care, the consequence of a mistake can often be death the patient. Consequences may also be present for the hospital such as loss of accreditation, and negative media attention.

### ***Immediate feedback***

HROs are also characterized by “immediate feedback” resulting from their decisions (Roberts & Rousseau 1989). Immediate feedback is a characteristic of effective team performance. Team members must monitor each other and provide each other feedback to maximize team functioning. However, feedback here focuses on team process and its improvement rather than solely on team outcomes. To ensure that feedback occurs, team members must be trained to deliver timely, behavioral, and specific feedback to one another.

### ***Outcomes occur simultaneously***

The last characteristic of HROs is that critical outcomes occur simultaneously (Roberts & Rousseau 1989). Team members work together on interdependent tasks. This is what

separates teams from groups or individuals working in isolation. Interdependency creates the need for synchronization of activities and outcomes.

### **2.3.8. Teamwork the Key to Implementing Guidelines**

#### ***Resistance to implementing guidelines***

Much resistance and many obstacles have been put in the path of the uptake and use of guidelines. Some say they limit clinical freedom or stifle innovation. Others are concerned about the potential to formalize unsound practice and have anxieties about exposure of negligence.

Nevertheless, it is mainly believed that these objections have no particular substance. Some individual freedom will be sacrificed for the benefits of team working, but that sacrifice is small. Senior clinicians are key individuals in agreeing guidelines and recognize areas where there is a true need for discretion and decision making. The restriction of clinical freedom is trivial. Guidelines do not stifle innovation. In reality they prevent one off experimentation on patients and provide a framework which should allow measurement of the effect of the total package of care on outcome. Guidelines formulated in full, open discussion are unlikely to formalize unsound practice. Rather, by making practice explicit they should bring about its improvement. Anxieties about legal challenges seem ill founded except for those who wish to work in a totally individualistic way. The existence of an explicit and open standard of care is a protection for patient and practitioner rather than a source of difficulty. The real source of the problems with the integration of guidelines in practice lies elsewhere. Despite the widely held belief that professionals in the health service work well as teams the reality shows a different picture.

Each profession plans and documents its care separately, and this separation is often carried over into the way that each works. The current model of care is dominated by the medical paradigm which treats each new case as a new episode, multidisciplinary care planning is the exception rather than the rule, and guidelines that "medical staff" will follow are still emphasized. For doctors the real issue is whether they wish to be members of a team or continue as individualistic operators. On the whole they are people with a strong need to work autonomously, they need to analyze a problem and then chart their own course of action. They don't have the literacy of team work,

collaboration, and empowering other people. They are used to personal intervention rather than working in a team.

The onus of implementing medical guidelines has been given covertly to junior doctors. But within the medical hierarchy these doctors are usually expected to be developing their own personal skills, concentrating on professional examinations, and responding primarily to their medical teams, rather than working explicitly as part of a multidisciplinary group.

Clinical guidelines developed by any institution need the commitment of people working for that institution. Doctors in training do not have the necessary investment in organizations for which they work for only a very short time. Guidelines which have a medical bias do not encompass the work of other professionals, and the resulting lack of sense of ownership is an important contributory factor in the failure of guidelines to work. Without that sense of ownership clinical guidelines will remain in the coat pockets of staff or lay somewhere gathering dust.

### ***Conscious team building***

Based on the experience, multidisciplinary guidelines are much more likely to be implemented and accepted than medical guidelines. But there are problems with devising such guidelines. One is the belief that each step should have been the subject of verification. Such standards are not available for many aspects of routine care. The total package of care as normally given is so unstandardized that proof of the value of the total package is simply not available. Of course, proof is available to support the value of some single stages of care, and guidelines should incorporate proven best care. Evaluation of the merits of protocols of care will be possible only when there are enough protocols to permit valid comparison. Meanwhile, lack of proof that planned, team care is better than unplanned care given by uncommunicative individuals is no reason for not adopting planned approach. Moreover, analogies from other complex production processes support strongly the view that adopting protocols of care will improve the quality of practice. Medical guidelines are unlikely to have an impact on clinical care for the very reason that they are medical and are not shared by all members of a clinical team. The difficulties encountered in simply disseminating guidelines suggest that the problem lies with the organization of care. Professionals are trapped into working within professional boundaries. Until they come to grips with the reality of

the need to improve coordination and planning of care and to learn to work within multi-professional teams, guidelines are unlikely to have any impact. Uni-professional guidelines are unlikely to work. Multi-professional guidelines may be the key to unlock the potential for change in health care (Martin McNicol et al., 1993).

### **2.3.9. Are teamwork and professional autonomy compatible, and do they result in improved hospital care?**

A postal questionnaire survey of 10,022 staff nurses in 32 hospitals in England was undertaken to explore the relationship between interdisciplinary teamwork and nurse autonomy on patient and nurse outcomes and nurse assessed quality of care. The key variables of nursing autonomy, control over resources, and relationship with doctors, emotional exhaustion, and decision making were found to correlate with one another as well as having a relationship with nurse assessed quality of care and nurse satisfaction.

The quotes of this study have shown the value of teamwork and its association with a range of positive occupational and organizational attributes such as job satisfaction, satisfaction with being a nurse, plans to remain in post, and lower levels of reported burnout. Higher reported levels of teamwork also seemed to impact on nurse assessed quality of care. Furthermore, a strong association was identified between teamwork and autonomy. It is not possible to specify whether teamwork is a pre-condition for autonomy or vice versa, but their interaction would suggest synergy rather than conflict. Organizations could therefore be encouraged to promote nurse autonomy without fearing that it might undermine teamwork. Reciprocity and respect are the cornerstones of “social capital”, defined as features of social organization such as trust, norms and networks that can improve the efficiency of society by facilitating coordinated action. Organizations rich in social capital benefit from high levels of trust between workers and are less hierarchical. Clearly, further work would be required to explore the concept, its practical utility, and how it operates and flows within organizations. Such work may help to shed light on the operant mechanisms associated with organizational context and features of the relationship between teamwork and autonomy. Such an association would appear to support the call for the new professionalism first articulated in Stacey’s study of the General Medical Council in the 1980s. A lay member of the Council Stacey argued that doctors must recognize the contribution of others, including the patient, to health and modify the sacrosanct concept of autonomy and jurisdiction over allied professions. In essence what Stacey advocated was nothing less than the

rolling back of self-regulation. Calls for more democratic forms of professionalism are not new but the pace and direction of reform in many health systems may accelerate the trend towards multiprofessional working. Teamwork is likely to be increasingly critical to organizational performance and success in the future (Rafferty et al., 2001).

## **2.4. Case Studies**

### **2.4.1 Interdisciplinary Teamwork in Physical and Rehabilitation Medicine**

Evidence from larger trials indicates that PRM programs with multidisciplinary teams achieve better results. For example, in those with sub-acute and chronic low back pain, cardio-respiratory and neurological disorders, than services that lack such PRM teams. Indeed, good team working may have a significant influence on survival. Whilst there is limited evidence concerning what constitutes the key components of successful teams in PRM programs. The theoretical basis for good team working has been well-described in other settings. This includes, agreed aims, agreement and understanding on how best to achieve these (avoiding jargon unique to a particular profession), appropriate range of knowledge and skills for the agreed task, mutual trust and respect, as well as willingness to share knowledge and expertise and speak openly. UEMS (European Union of Medical Specialists) PRM Section therefore, believes there is a very strong case for recommending this pattern of working. PRM specialists have an essential role to play in interdisciplinary teams, their training and specific expertise enables them to diagnose and assess severity of health problems, as well as a prerequisite for safe intervention. Their broad training also means they are able to take holistic view of an individual patient's care and are therefore well-placed to coordinate PRM programs, to develop them and evaluate new management strategies (Neumann et al., 2010).

### **2.4.2. Effects of multidisciplinary Teamwork on breast cancer survival: retrospective, comparative, interventional cohort study of 13722 women**

Describing the effect of multidisciplinary care on survival in women treated for breast cancer, a retrospective study was designed, which was comparative, non-randomized and interventional cohort, in NHS hospitals, health boards in the west of Scotland, UK. Main outcome measures were breast cancer specific mortality and all-cause mortality. As regards the results of the research before the introduction of multidisciplinary care,

breast cancer mortality was 11% higher in the intervention area than in the non-intervention area. After multidisciplinary care was introduced, breast cancer mortality was 18% lower in the intervention area, compared with this of the non-intervention area. All-cause mortality did not differ significantly between populations in the earlier period, but was 11% lower in the intervention area than in the non-interventional area in the later period.

In conclusion, introduction of multidisciplinary care was associated with improved survival and reduced variation in survival among hospitals. Further analysis of clinical audit data for multidisciplinary care could identify which aspects of care are most associated with survival benefits (Eileen M Kesson et al., 2012).

#### **2.4.3. Team working: palliative care as a model of interdisciplinary practice**

Palliative care embraces a number of different frameworks and approaches to meet the needs of the “whole” person. This case speaks about the many dimensions of dying and aim to provide maximum comfort and support. The team is engaged in broad efforts. Moreover, the origin of palliative care lie in the areas of religious care and nursing, rather than medicine and palliative care draws heavily on a broad spectrum of disciplines, knowledge, skills, experience and creative thought. Palliative care team may include nurses, doctors, social workers, volunteers, chaplains and health practitioners. Medical science has come to new understanding of the whole aspects of the human being, so more lately has supported the development of multidisciplinary approaches. The benefits are presented here below:

Benefits for the patient:The opportunity for genuine consultation and collaboration offers great benefit for the patient. These benefits have been an integral part of the practice of medicine for a long time, but the concept of who has the final say when there is conflict may still present difficulties. In palliative care, the final decision-maker is the patient, and the patient uses many pieces of information, many sources of support, and their own values as a guide.

Benefits for practitioners: Practitioners who engage in teamwork benefit from the support and wisdom of diverse colleagues, but also need to be prepared to be challenged and at times, to practice courage and humility. A challenge for specialist teams is to support primary careers, such as general practitioners and generalist community nurses,

in caring for their patients. Primary careers may need encouragement to work in a team. In the early stages of working closely with others, the time and effort required for good communication seems costly. The dynamics of mutual inclusion are not always easy. Communication is a core requirement to establish roles and responsibilities. A well-constructed formal summary of assessment is a valuable basis for collaborative care. Teams should try to develop some continuity in who interfaces with a specific primary career, to allow relationships and secure referral pathways to develop.

Benefits to specialists in other areas of care: Models incorporating shared roles and responsibilities offer more than the sum of the competencies of the individual team members. A true benefit of these models is that each team member can support and further the therapeutic goals of other team members. Opportunities for research and investigation may multiply. The result is that the healthcare system as a whole remains responsive to the changing needs of the community it serves. It may be that, just as palliative care has evolved over a number of decades, the challenges of multi- and interdisciplinary teamwork will help with the evolution of new approaches to patient care in broader contexts (Crawford & Price, 2003).

#### **2.4.4. Multidisciplinary team working, clinical networks, and chambers; opportunities to work differently in the NHS”**

A group of 27 urological surgeons in London explored the possibilities of a new organizational arrangement early in 2002. Some useful insights emerged. Colleagues were asked to submit their existing job plans for both NHS and private work, and to file their ideal job plans.

The first issue that arose was to suit individual surgeons through working as a group. They were spread special interests and there were many points of agreement as well as some obvious difficulties. At last a small group of 12 urological surgeons from three trusts and four hospital sites have started working together with arrangements to cover each other's practices, agreed guidelines for referral, and developed internal subspecialist practices. The team was multidisciplinary and works across organizational boundaries and can thus be termed a clinical network. The clinical network was in a position to negotiate with primary care trusts and was changing referral practice and surgical activity from site to site, so as to optimize efficiency. Quality of care has been enhanced by the application of standard protocols and the centralization of complex care

for particular procedures to each site. The management of emergency care has been considerably enhanced because of the ability to provide a dedicated team of urologists on one site, which would have been impossible at each individual hospital. Generally the group was much more self-reliant and felt more able to control its work, and thus felt more autonomous. There is now a need to learn more about ways in which this group can develop a formal organizational structure that can fit into a wider family of NHS organizations. A significant barrier to achievement of improved care in the NHS is the shortage of clinical staff. This is a possible stimulus for reform of the organization of care so that clinical staff is organized in ways better able to meet the needs of today's patients. The NHS should harness this energy, and encourage such initiatives so that it can find new ways through which effective and functional teams can deliver health care. This is a unique opportunity to renegotiate the organization and deployment of the most valuable resource: highly trained health care professionals. It has to be a new organizational model or models for the delivery of health care are needed to modernize the way in which teams and staff are used. There is an inherent assumption that modernization of systems and processes bring improvements in quality although it is necessary to test this hypothesis carefully. It is likely that effective and functioning teams do provide better care. For real improvements in the quality of care significant changes will need to be made to the way in which clinical resources are organized. Of course, there are many obstacles for example, related to remuneration, but change seems likely.

If new ways could be found through which effective and functional teams can deliver health care then this could be beneficial for patients and staff.

### **Key messages**

- Multidisciplinary team working provides many opportunities to improve the quality of health care.
- New organizational structures are emerging to challenge the traditional model of employment in the NHS and should be encouraged and evaluated.
- More research is needed on the outcomes of multidisciplinary team working, new ways of organizing healthcare staff, and the effect of both on the quality of care.
- Investigate many different models for employing groups of staff which exist both in other industries and health systems. The investigation has to determine

which would be most suitable for the NHS, and which offer the greatest opportunity for better safer health care (Carter et al., 2003)

#### **2.4.5. Multidisciplinary team working across different tumors types: analysis of a national survey**

Using data from a national survey, this study aimed to address whether the current model for multidisciplinary team (MDT) working is appropriate for all tumor types. Responses to the 2009 National Cancer Action Team national survey were analyzed by tumor type. Differences indicate lack of consensus between MDT members in different tumor types.

One thousand one hundred and forty-one (1.141) respondents from breast, gynecological, colorectal, upper gastrointestinal, urological, head and neck, hematological and lung MDTs were included in the study. One hundred and sixteen out of 136 statements demonstrated consensus between respondents in different tumor types. There were no differences regarding the infrastructure for meetings and team governance. Significant consensus was seen for team characteristics and respondents disagreed regarding certain aspects of meeting organizations and logistics, as well as patient-centered decision making. Hematology MDT members were outliers in relation to the clinical decision-making process, and lung MDT members disagreed with other tumor types regarding treating patients with advanced disease. This analysis reveals strong consensus between MDT members from different tumor types, while also identifying areas that require a more tailored approach, such as the clinical decision-making process, and preparation for and the organization of MDT meetings. Policymakers should remain sensitive to the needs of health care teams working in individual tumor types (Lamb et al., 2011).

### **3. Research Methodology**

The purpose of this research is to investigate the differences between the medical and the nursing/obstetric staff, as well as years of service and the factors of effective teamwork in the health services.

The survey was conducted in autumn 2016 - winter of 2017 and it was performed in a general hospital in Northern Greece. A self administrative questionnaire of 35-item was chosen to collect the data for the research. It is consisted of two components: (1) the first five items concerning demographic data of the respondents (gender, age, education, specialty and years of service). (2) Thirty items concerning the attitudes of respondents concerning the factors of the effective teamwork. In the second part of the questionnaire, the 5-point Likert scale was used. For these items 1 means strongly disagree and 5 means strongly agree. All statistical analysis was conducted with the application of the SPSS 18.

More analytically the structure of the questionnaire was based on the TeamSTEPPS Teamwork Attitudes Questionnaire which prepared for U.S. Department of Defense, Tricare Management Activity by David P. Baker, Ph.D. Kelley J. Krokos, Ph.D. Andrea M. Amodeo, M.S. in 24 September 2008 and revised in 7 October 2008.

The Agency for Healthcare Research and Quality (AHRQ) and the Department of Defense (DoD) have been Federal leaders in the patient safety movement in November 2006, when in collaboration released TeamSTEPPS as the national standard for team training in health care. TeamSTEPPS, which stands for Team Strategies and Tools to Enhance Performance and Patient Safety, is the result of a multiyear research and development project. Since 2005, numerous organizations and individuals have contributed to the refinement of the TeamSTEPPS curriculum.

The T-TAQ was designed to measure individual attitudes related to the core components of teamwork that are captured within TeamSTEPPS. Specifically, individual attitudes toward team structure, leadership, mutual support, situation monitoring, and communication are measured. At the end there is an “open type” question, where the respondent could expose his/her opinion about the subject.

The distribution of the questionnaire accomplished with the permission of the hospitals Scientific Committee. In order to ensure the validity and reliability of the questionnaire, first a pilot implementation was conducted in a small number of respondents. Based on

the outcome of the pilot implementation, a fine tuning on the initial questionnaire was applied.

### Research Hypotheses

The survey examines 10 basic research hypotheses, which are related to the attitude variations between medical and nursing / obstetric staff, to the five teamwork factors, as well as if age affects the attitude of the employees about these factors.

### 4. Results analysis and Interpretation of findings

The sample size is 125 employees. It consists of 32 male, 87 female and 6 employees that didn't give details about their gender. The distribution of the sample according to Age and the Education Level is presented in Tables 1 and 2.

Table 1. Age group

|             | Frequency | Percent |
|-------------|-----------|---------|
| Valid 25-35 | 34        | 27,2    |
| 36-45       | 32        | 25,6    |
| 46-55       | 53        | 42,4    |
| 56-67       | 6         | 4,8     |
| Total       | 125       | 100,0   |

Table 2. Education level

|                            | Frequency | Percent |
|----------------------------|-----------|---------|
| Valid High School graduate | 23        | 18,4    |
| Undergraduate studies      | 80        | 64,0    |
| Postgraduate studies       | 10        | 8,0     |
| Doctoral studies           | 11        | 8,8     |
| Total                      | 124       | 99,2    |
| Missing System             | 1         | ,8      |
| Total                      | 125       | 100,0   |

43 persons of the sample belong to Medical staff and 82 to Nursing or Obstetric staff. The sample distribution according to years of service is presented in Table 3

Table 3. Years of service

|       |       | Frequency | Percent |
|-------|-------|-----------|---------|
| Valid | 0-10  | 44        | 35,2    |
|       | 11-20 | 31        | 24,8    |
|       | 21-30 | 47        | 37,6    |
|       | 31-40 | 3         | 2,4     |
|       | Total | 125       | 100,0   |

In Figure 1, it is noticed that the Medical staff that participates in the sample is in the majority less than 45 years old, when the majority in Nursing/Obstetric staff is between 46 and 55 years old.

Figure 1. Sample allocation according to age and position in hospital

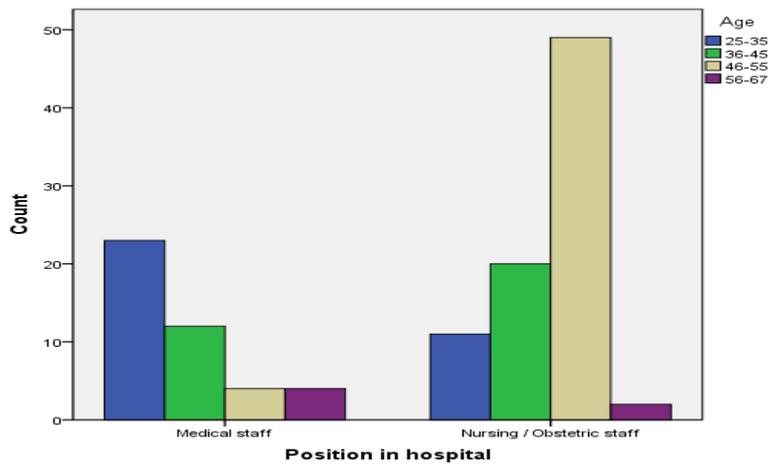
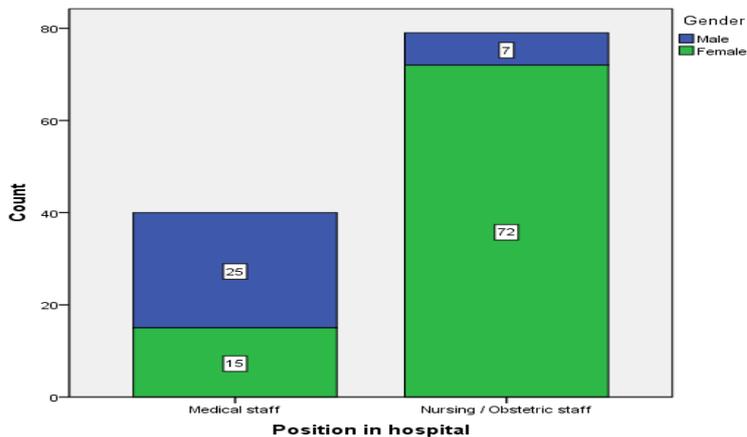


Figure 2 presents that about two third of the medical staff is male, but only 7 to 79 of the nursing/obstetric staff is male.

Figure 2. Allocation of sample according to position in hospital and gender



In this stage of the research the five factors are assessed, leading to the evaluation of the index Cronbach A, which is achieved. It is observed that all index values are higher to the value 0.7 indicating good consistency and trusted factors. The only exception is the factor “Mutual Support” which Cronbah’s A value is 0.679, slightly below 0.7.

Table 4.The five factors of teamwork and their Cronbach’s index A

| Factor               | Items                                                                                                                                | Cronbah’s A |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------|-------------|
| Team Structure       | 1. It is important to ask patients and their families for feedback regarding patient care.                                           | 0.774       |
|                      | 2. Patients are a critical component of the care team.                                                                               |             |
|                      | 3. This facility's administration influences the success of direct care teams.                                                       |             |
|                      | 4. A team's mission is of greater value than the goals of individual team members.                                                   |             |
|                      | 5. Effective team members can anticipate the needs of other team members.                                                            |             |
|                      | 6. High performing teams in health care share common characteristics with high performing teams in other industries.                 |             |
| Leadership           | 7. It is important for leaders to share information with team members.                                                               | 0.794       |
|                      | 8. Leaders should create informal opportunities for team members to share information.                                               |             |
|                      | 9. Effective leaders view honest mistakes as meaningful learning opportunities.                                                      |             |
|                      | 10. It is a leader's responsibility to model appropriate team behavior.                                                              |             |
|                      | 11. It is important for leaders to take time to discuss with their team members plans for each patient.                              |             |
|                      | 12. Team leaders should ensure that team members help each other out when necessary.                                                 |             |
| Situation Monitoring | 13. Individuals can be taught how to scan the environment for important situational cues.                                            | 0.721       |
|                      | 14. Monitoring patients provides an important contribution to effective team performance.                                            |             |
|                      | 15. Even individuals who are not part of the direct care team should be encouraged to scan for and report changes in patient status. |             |
|                      | 16. It is important to monitor the emotional and physical status of other team members.                                              |             |
|                      | 17. It is appropriate for one team member to offer assistance to another who may be too tired or stressed to perform a task.         |             |
|                      | 18. Team members who monitor their emotional and physical status on the job are                                                      |             |

|                |                                                                                                                                   |       |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------|-------|
|                | more effective.                                                                                                                   |       |
| Mutual Support | 19. To be effective, team members should understand the work of their fellow team members.                                        | 0.679 |
|                | 20. Asking for assistance from a team member is a sign that an individual does not know how to do his/her job effectively.        |       |
|                | 21. Providing assistance to team members is a sign that an individual does not have enough work to do.                            |       |
|                | 22. Offering to help a fellow team member with his/her individual work tasks is an effective tool for improving team performance. |       |
|                | 23. It is appropriate to continue to assert a patient safety concern until you are certain that it has been heard.                |       |
|                | 24. Personal conflicts between team members do not affect patient safety.                                                         |       |
| Communication  | 25. Teams that do not communicate effectively significantly increase their risk of committing errors.                             | 0.882 |
|                | 26. Poor communication is the most common cause of reported errors.                                                               |       |
|                | 27. Adverse events may be reduced by maintaining an information exchange with patients and their families.                        |       |
|                | 28. I prefer to work with team members who ask questions about information I provide.                                             |       |
|                | 29. It is important to have a standardized method for sharing information when handing off patients.                              |       |
|                | 30. It is nearly impossible to train individuals how to be better communicators.                                                  |       |

Given the above mentioned assessment, the values of the five factors are computed, as the mean value of the items that consist of each one of them.

Table 5 presents the mean value for each factor separately for medical and nursing / obstetric staff. We observe that nursing / obstetric staff has higher mean values in all factors. Table 6 explains, using Independent samples T-test method, that these differences are statistical significant only for “Leadership” and “Situation Monitoring”.

More specifically, the value of factor "Leadership" is affected by the position in hospital at a confidence level of 5% (T-test value = -2,288, df = 122, sig = 0.024 < 0.05). That means nursing / obstetric staff has between 0.0259 to 0.3596 higher average score in factor “Leadership”, compared to medical staff. Likewise we observe that the value of factor "Situation Monitoring" is affected by the position in hospital at a confidence level of 5% (T-test value = -2,695, df = 122, sig = 0.008 < 0.05). That means nursing /

obstetric staff has between 0.0625 to 0.4088 higher average score in factor “Situation Monitoring”, compared to medical staff. In all other factors, the differences are not statistical significant in a significant level 5%, as the sig (2-tailed) are higher than 0.05.

Table 5. Mean values for each factor separately for Medical and Nursing / Obstetric staff

|                      | Position in hospital      | Frequency | Mean   | Std. Deviation |
|----------------------|---------------------------|-----------|--------|----------------|
| Team_structure       | Medical staff             | 43        | 3,9860 | ,40943         |
|                      | Nursing / Obstetric staff | 81        | 4,0428 | ,47023         |
| Leadership           | Medical staff             | 43        | 4,1899 | ,45655         |
|                      | Nursing / Obstetric staff | 81        | 4,3827 | ,44131         |
| Situation_Monitoring | Medical staff             | 43        | 4,0349 | ,55701         |
|                      | Nursing / Obstetric staff | 81        | 4,2706 | ,40602         |
| Mutual_Support       | Medical staff             | 42        | 3,1310 | ,43170         |
|                      | Nursing / Obstetric staff | 80        | 3,2413 | ,29128         |
| Communication        | Medical staff             | 42        | 3,5317 | ,48729         |
|                      | Nursing / Obstetric staff | 80        | 3,6129 | ,43450         |

Table 6.Independent Samples T-tests for each factor among Medical and Nursing / Obstetric staff

|                      | Levene's Test for Equality of Variances |      | t-test for Equality of Means |        |                 |                 |                       |                                           |               |  |
|----------------------|-----------------------------------------|------|------------------------------|--------|-----------------|-----------------|-----------------------|-------------------------------------------|---------------|--|
|                      | F                                       | Sig. | t                            | df     | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference |               |  |
|                      |                                         |      |                              |        |                 |                 |                       | Lower                                     | Upper         |  |
| Team_structure       | 1,943                                   | ,166 | -,668                        | 122    | ,505            | -,0567          | ,0849                 | -,2249                                    | ,1114         |  |
|                      |                                         |      | -,697                        | 96,558 | ,487            | -,0567          | ,0814                 | -,2183                                    | ,1048         |  |
| Leadership           | ,112                                    | ,739 | -2,288                       | 122    | <b>,024</b>     | -,1927          | ,0842                 | <b>-,3596</b>                             | <b>-,0259</b> |  |
|                      |                                         |      | -2,264                       | 83,245 | ,026            | -,1927          | ,0851                 | -,3621                                    | -,0234        |  |
| Situation_Monitoring | 2,279                                   | ,134 | -2,695                       | 122    | <b>,008</b>     | -,2356          | ,0874                 | <b>-,4088</b>                             | <b>-,0625</b> |  |

|                                |                                |       |        |        |        |        |        |        |        |       |
|--------------------------------|--------------------------------|-------|--------|--------|--------|--------|--------|--------|--------|-------|
| Equal variances<br>not assumed |                                |       | -2,451 | 66,267 | ,017   | -,2356 | ,0961  | -,4277 | -,0436 |       |
| Mutual_Support                 | Equal variances<br>assumed     | 6,869 | ,010   | -1,674 | 120    | ,097   | -,1103 | ,0658  | -,2407 | ,0201 |
|                                | Equal variances<br>not assumed |       |        | -1,488 | 61,129 | ,142   | -,1103 | ,0741  | -,2585 | ,0379 |
| Communication                  | Equal variances<br>assumed     | ,832  | ,364   | -,940  | 120    | ,349   | -,0811 | ,0863  | -,2521 | ,0898 |
|                                | Equal variances<br>not assumed |       |        | -,907  | 75,541 | ,367   | -,0811 | ,0895  | -,2594 | ,0971 |

Table 7 presents the average score of “**Team Structure**” separately for each age category. It is noticed that age categories “36-45” and “46-55” have the higher score. To see whether these differences are statistically significant the One Way ANOVA method was performed. It is found that the value of F-test is  $F_{3,120}=0.569$ , with corresponding p-value =  $0.636 > 0.05$ . That is all four age groups do not differ as to the score of “team structure” factor.

Table 7. Average score of “**Team Structure**” separate for each age category

|       | Frequency | Mean   | Std. Deviation |
|-------|-----------|--------|----------------|
| 25-35 | 34        | 3,9716 | ,48825         |
| 36-45 | 32        | 4,0708 | ,35568         |
| 46-55 | 52        | 4,0462 | ,46075         |
| 56-67 | 6         | 3,8611 | ,60934         |
| Total | 124       | 4,0231 | ,44921         |

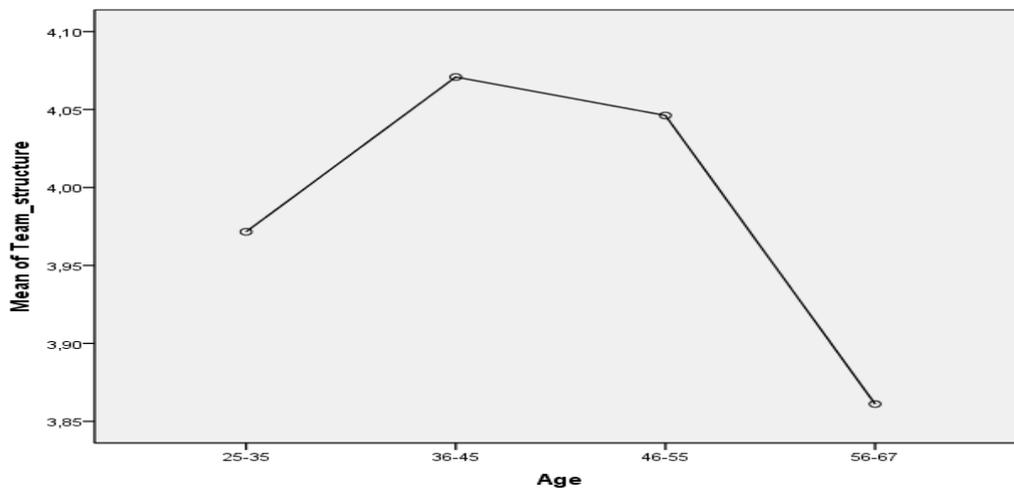


Table 8 presents the average score of “**Leadership**” separately for each age category. The age category “25-35” has the lower score of “**Leadership**”. To see whether these differences are statistically significant the One Way ANOVA method is performed. The value of F-test is  $F_{3,120}=5.711$ , with corresponding p-value =  $0.001 < 0.05$ . Therefore there is a statistically significant effect of age on the factor "Leadership" at a 5% significant level.

Table 9 presents the age groups that differ. Only age groups “25-35” and “36-45” differs with p-value =  $0.001 < 0.05$ . More specifically it is concluded that age group “36-45” has higher score in factor “**Leadership**” between 0.1421 and 0.6943, compared to age groups “25-35”.

Table 8. Average score of “**Leadership**” separate for each age category

|       | Frequency | Mean   | Std. Deviation |
|-------|-----------|--------|----------------|
| 25-35 | 34        | 4,1078 | ,48354         |
| 36-45 | 32        | 4,5260 | ,40629         |
| 46-55 | 52        | 4,2981 | ,40602         |
| 56-67 | 6         | 4,5278 | ,43991         |
| Total | 124       | 4,3159 | ,45424         |

Table 9. Multiple Comparisons for mean value of “**Leadership**” among different age groups

| (I) Age | (J) Age | Mean Difference (I-J) | Std. Error | Sig.  | 95% Confidence Interval |             |
|---------|---------|-----------------------|------------|-------|-------------------------|-------------|
|         |         |                       |            |       | Lower Bound             | Upper Bound |
| 25-35   | 36-45   | -,41820*              | ,10596     | ,001  | -,6943                  | -,1421      |
|         | 46-55   | -,19023               | ,09488     | ,192  | -,4374                  | ,0570       |
|         | 56-67   | -,41993               | ,19049     | ,128  | -,9162                  | ,0764       |
| 36-45   | 25-35   | ,41820*               | ,10596     | ,001  | ,1421                   | ,6943       |
|         | 46-55   | ,22796                | ,09666     | ,091  | -,0239                  | ,4798       |
|         | 56-67   | -,00174               | ,19138     | 1,000 | -,5004                  | ,4969       |
| 46-55   | 25-35   | ,19023                | ,09488     | ,192  | -,0570                  | ,4374       |
|         | 36-45   | -,22796               | ,09666     | ,091  | -,4798                  | ,0239       |
|         | 56-67   | -,22970               | ,18548     | ,604  | -,7130                  | ,2536       |
| 56-67   | 25-35   | ,41993                | ,19049     | ,128  | -,0764                  | ,9162       |
|         | 36-45   | ,00174                | ,19138     | 1,000 | -,4969                  | ,5004       |
|         | 46-55   | ,22970                | ,18548     | ,604  | -,2536                  | ,7130       |

\*. The mean difference is significant at the 0.05 level.

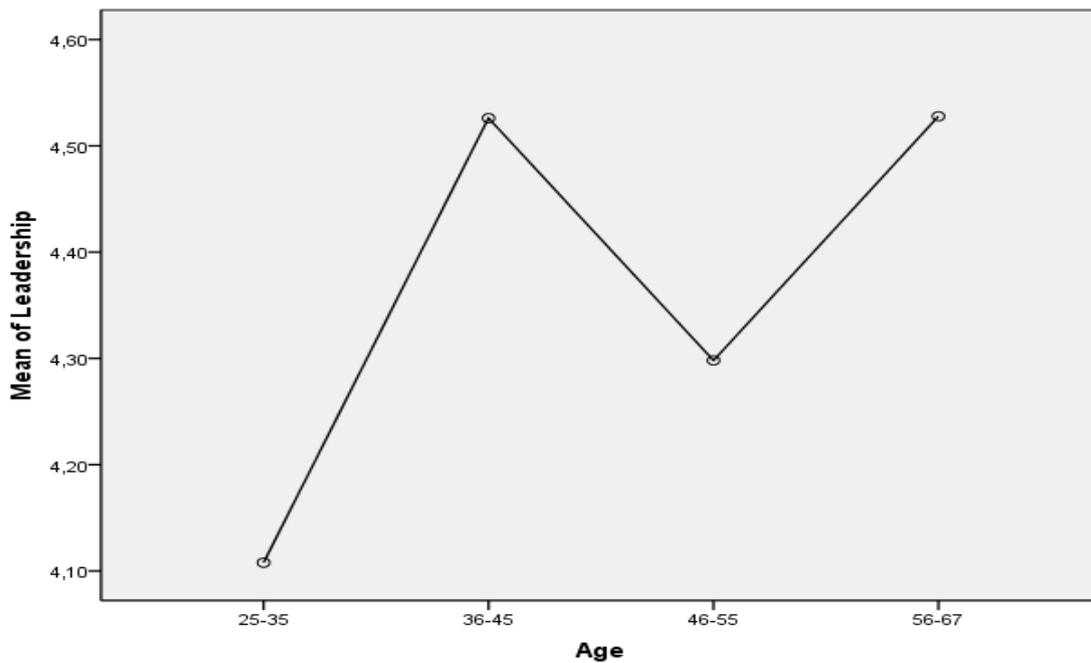


Figure 3. Mean values of factor “Leadership” for each age category

In Figure 3 a comparison of mean score of factor “Leadership” among the four age categories is presented.

Table 10 presents the average score of “Situation Monitoring” separately for each age category. The age category “25-35” has the lower score of “Situation Monitoring”. To see whether these differences are statistically significant, the One Way ANOVA method is performed. The value of F-test is  $F_{3,120}=5.487$  with corresponding p-value =  $0.001 < 0.05$ . Therefore there is a statistically significant effect of age on the factor “Situation Monitoring” at a 5% significant level.

Table 10. Average score of “Situation Monitoring” separate for each age category

|       | Frequency | Mean   | Std. Deviation |
|-------|-----------|--------|----------------|
| 25-35 | 34        | 3,9240 | ,59188         |
| 36-45 | 32        | 4,2865 | ,37920         |
| 46-55 | 52        | 4,2788 | ,38592         |
| 56-67 | 6         | 4,3889 | ,40369         |
| Total | 124       | 4,1888 | ,47523         |

Table 11 presents the age groups that differ. We notice that only age group “25-35” differs from “36-45” and “46-55” with p-value =  $0.008 < 0.05$  and  $0,003 < 0,05$  respectively. More specifically we conclude that age group “36-45” has higher score in factor “Situation Monitoring” between 0.0729 and 0.6520, compared to age groups “25-35”. Likewise, age group “46-55” has higher score in factor “Situation Monitoring”

between 0.0956 and 0.6141, compared to age groups “25-35”.All other age groups do not differ from each other.

Table 11. Multiple Comparisons for mean value of “Situation Monitoring” among different age groups

| (I) Age | (J) Age | Mean Difference (I-J) | Std. Error | Sig.  | 95% Confidence Interval |             |
|---------|---------|-----------------------|------------|-------|-------------------------|-------------|
|         |         |                       |            |       | Lower Bound             | Upper Bound |
| 25-35   | 36-45   | -,36244 <sup>*</sup>  | ,11113     | ,008  | -,6520                  | -,0729      |
|         | 46-55   | -,35483 <sup>*</sup>  | ,09951     | ,003  | -,6141                  | -,0956      |
|         | 56-67   | -,46487               | ,19979     | ,098  | -,9854                  | ,0557       |
| 36-45   | 25-35   | ,36244 <sup>*</sup>   | ,11113     | ,008  | ,0729                   | ,6520       |
|         | 46-55   | ,00761                | ,10137     | 1,000 | -,2565                  | ,2717       |
|         | 56-67   | -,10243               | ,20072     | ,956  | -,6254                  | ,4205       |
| 46-55   | 25-35   | ,35483 <sup>*</sup>   | ,09951     | ,003  | ,0956                   | ,6141       |
|         | 36-45   | -,00761               | ,10137     | 1,000 | -,2717                  | ,2565       |
|         | 56-67   | -,11004               | ,19453     | ,942  | -,6169                  | ,3968       |
| 56-67   | 25-35   | ,46487                | ,19979     | ,098  | -,0557                  | ,9854       |
|         | 36-45   | ,10243                | ,20072     | ,956  | -,4205                  | ,6254       |
|         | 46-55   | ,11004                | ,19453     | ,942  | -,3968                  | ,6169       |

\*. The mean difference is significant at the 0.05 level.

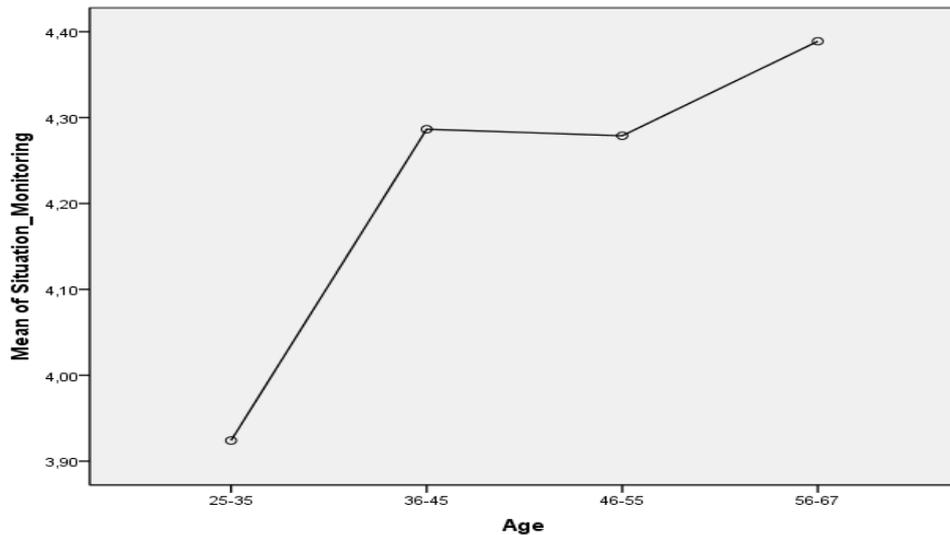


Figure 4. Mean values of factor “Situation Monitoring” for each age category

Figure 4 presents a comparison of mean score of factor “Situation Monitoring” among the four age categories.

Table 12 presents the average score of “Mutual Support” separately for each age category. The age category “25-35” has the lower score of “Mutual Support”. To see whether these differences are statistically significant the One Way ANOVA method is

performed. The value of F-test is  $F_{3,118}=4.758$  with corresponding p-value =  $0.004 < 0.05$ . Therefore there is a statistically significant effect of age on the factor “Mutual Support” at a 5% significant level.

Table 13 presents the age groups that differ. The only age group “25-35” differs from “36-45”, “46-55” and “56-67” with p-value =  $0.028 < 0.05$ ,  $0.017 < 0.05$  and  $0.028 < 0.05$  respectively. More specifically it is concluded that age group “36-45” has higher score in factor “Mutual Support” between 0.0184 and 0.4524, compared to age groups “25-35”. Likewise, age group “46-55” has higher score in factor “Mutual Support” between 0.0299 and 0.4201, compared to age groups “25-35”. Finally age group “56-67” has higher score in factor “Mutual Support” between 0.0332 and 0.8057, compared to age groups “25-35”. All other age groups do not differ from each other.

Table 12. Average score of “Mutual Support” separate for each age category

|       | Frequency | Mean   | Std. Deviation |
|-------|-----------|--------|----------------|
| 25-35 | 32        | 3,0250 | ,35256         |
| 36-45 | 32        | 3,2604 | ,37132         |
| 46-55 | 52        | 3,2500 | ,28724         |
| 56-67 | 6         | 3,4444 | ,38968         |
| Total | 122       | 3,2033 | ,34830         |

Table 13. Multiple Comparisons for mean value of “Mutual Support” among different age groups

| (I) Age | (J) Age | Mean Difference (I-J) | Std. Error | Sig. | 95% Confidence Interval |             |
|---------|---------|-----------------------|------------|------|-------------------------|-------------|
|         |         |                       |            |      | Lower Bound             | Upper Bound |
| 25-35   | 36-45   | -,23542*              | ,08328     | ,028 | -,4524                  | -,0184      |
|         | 46-55   | -,22500*              | ,07485     | ,017 | -,4201                  | -,0299      |
|         | 56-67   | -,41944*              | ,14820     | ,028 | -,8057                  | -,0332      |
| 36-45   | 25-35   | ,23542*               | ,08328     | ,028 | ,0184                   | ,4524       |
|         | 46-55   | ,01042                | ,07485     | ,999 | -,1846                  | ,2055       |
|         | 56-67   | -,18403               | ,14820     | ,602 | -,5702                  | ,2022       |
| 46-55   | 25-35   | ,22500*               | ,07485     | ,017 | ,0299                   | ,4201       |
|         | 36-45   | -,01042               | ,07485     | ,999 | -,2055                  | ,1846       |
|         | 56-67   | -,19444               | ,14363     | ,531 | -,5687                  | ,1799       |
| 56-67   | 25-35   | ,41944*               | ,14820     | ,028 | ,0332                   | ,8057       |
|         | 36-45   | ,18403                | ,14820     | ,602 | -,2022                  | ,5702       |
|         | 46-55   | ,19444                | ,14363     | ,531 | -,1799                  | ,5687       |

\*. The mean difference is significant at the 0.05 level.

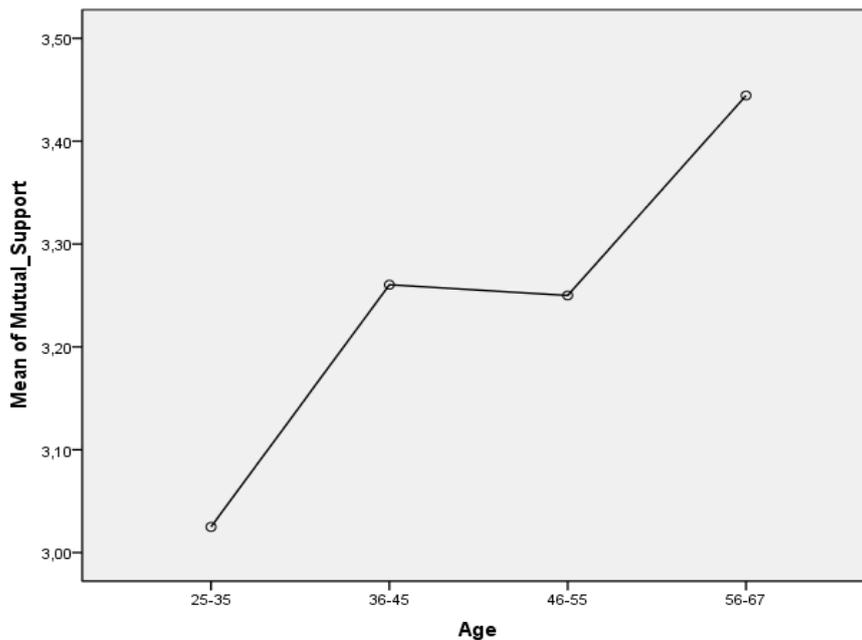


Figure 5. Mean values of factor “Mutual Support” for each age category

In Figure 5 a comparison of mean score of factor “Mutual Support” among the four age categories is indicated.

Table 14 presents the average score of “Communication” separately for each age category. The age category “25-35” has the lower score of “Communication”. To see whether these differences are statistically significant the One Way ANOVA method is performed. The value of F-test is  $F_{3,118}=5.195$  with corresponding p-value =  $0.002 < 0.05$ . Therefore there is a statistically significant effect of age on the factor “Communication” at a 5% significant level.

Table 15 presents the age groups that differ. The only age group “25-35” differs from “36-45”, “46-55” and “56-67” with p-value =  $0.022 < 0.05$ ,  $0,005 < 0,05$  and  $0.039 < 0.05$  respectively. More specifically is conclude that age group “36-45” has higher score in factor “Communication” between 0.0337 and 0.5955, compared to age groups “25-35”. Likewise, age group “46-55” has higher score in factor “Communication” between 0.0771 and 0.5820, compared to age groups “25-35”. Finally age group “56-67” has higher score in factor “Communication” between 0.0192 and 1.0189, compared to age groups “25-35”. All other age groups do not differ from each other.

Table 14. Average score of “Communication” separate for each age category

|       | Frequency | Mean   | Std. Deviation |
|-------|-----------|--------|----------------|
| 25-35 | 32        | 3,3365 | ,46792         |
| 36-45 | 32        | 3,6510 | ,36505         |
| 46-55 | 52        | 3,6660 | ,44626         |
| 56-67 | 6         | 3,8556 | ,41455         |
| Total | 122       | 3,5850 | ,45301         |

Table 15. Multiple Comparisons for mean value of “Communication” among different age groups

| (I) Age | (J) Age | Mean Difference (I-J) | Std. Error | Sig. | 95% Confidence Interval |             |
|---------|---------|-----------------------|------------|------|-------------------------|-------------|
|         |         |                       |            |      | Lower Bound             | Upper Bound |
| 25-35   | 36-45   | -,31458*              | ,10779     | ,022 | -,5955                  | -,0337      |
|         | 46-55   | -,32957*              | ,09687     | ,005 | -,5820                  | -,0771      |
|         | 56-67   | -,51910*              | ,19181     | ,039 | -1,0189                 | -,0192      |
| 36-45   | 25-35   | ,31458*               | ,10779     | ,022 | ,0337                   | ,5955       |
|         | 46-55   | -,01498               | ,09687     | ,999 | -,2674                  | ,2375       |
|         | 56-67   | -,20451               | ,19181     | ,711 | -,7044                  | ,2953       |
| 46-55   | 25-35   | ,32957*               | ,09687     | ,005 | ,0771                   | ,5820       |
|         | 36-45   | ,01498                | ,09687     | ,999 | -,2375                  | ,2674       |
|         | 56-67   | -,18953               | ,18589     | ,738 | -,6740                  | ,2949       |
| 56-67   | 25-35   | ,51910*               | ,19181     | ,039 | ,0192                   | 1,0189      |
|         | 36-45   | ,20451                | ,19181     | ,711 | -,2953                  | ,7044       |
|         | 46-55   | ,18953                | ,18589     | ,738 | -,2949                  | ,6740       |

\*. The mean difference is significant at the 0.05 level.

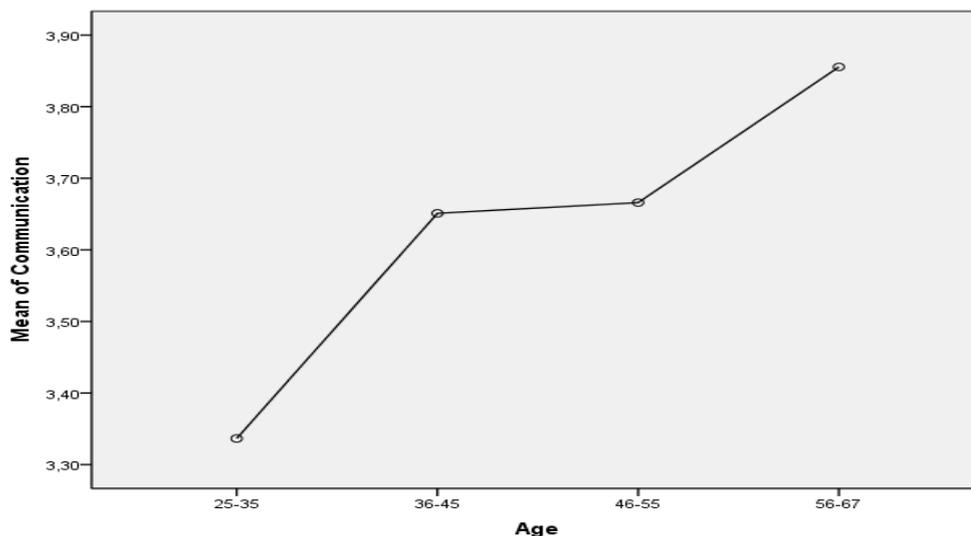


Figure 6. Mean values of factor “Communication” for each age category

Figure 6 presents a comparison of mean score of factor “Communication” among the four age categories.

## 5. Conclusions:

This study has shown the differences in attitudes of medical & nursing / obstetric, as well as in relation with the age groups, toward the components of teamworking consisted of team structure, leadership, situation monitoring, mutual support, and communication.

In general the two professional groups show almost the same attitude in teamworking components. More specifically it is observed that nursing / obstetric staff has slightly more positive attitude in all teamworking components. It had also found that these differences are statistical significant only for “Leadership” and “Situation Monitoring”.

Concerning the age effect on the examined teamworking components it is found that the younger professionals show less positive attitude in four out of the five components, comparing with the more mature ages.

The average score of “**Team Structure**” separately for each age category shows that age categories “36-45” and “46-55” have more positive attitude. However, applying the “One Way ANOVA method”, it is shown that these differences were not statistical significant, concluding that all four age categories have the same attitude toward the “team structure” component.

The average score of “**Leadership**” separately for each age category shows that category “25-35” has less positive attitude toward “Leadership”, while the category “36-45” is the most positive. Applying the “One Way ANOVA method”, it is confirmed that there is a statistical significant effect of age on the factor "Leadership".

The average score of “**Situation Monitoring**” separately for each age category shows that the age category “25-35” is the less positive toward “Situation Monitoring”, while the categories “36-45” and “46-55” are both more positive at the same level. The “One Way ANOVA method” confirms that there is a statistically significant effect of age on the factor “Situation Monitoring”.

The average score of “**Mutual Support**” separately for each age category shows that the age category “25-35” is the less positive toward “Mutual Support”. Moreover it is also found that the attitude on “mutual support” is progressively more positive, increasing the age, with the age category “56-67” to be the most positive. The “One Way ANOVA method” confirms that there is a statistical significant effect of age on the

factor “Mutual Support”, with the age category “25-35” differs from all other categories, while the two intermediate age categories “36-45” and “46-55” do not differ each other.

The average score of “**Communication**” separately for each age category shows that the age category “25-35” is the less positive toward “Communication”. Moreover, it is also found that the attitude on “communication” is progressively more positive, increasing the age, with the age category “56-67” to be the most positive. The “One Way ANOVA method” confirms that there is a statistical significant effect of age on the factor “Mutual Support”, with the age category “25-35” differs from all other categories, while the two intermediate age categories “36-45” and “46-55” do not differ each other.

From the above mentioned conclusions it is obvious that the health professionals obtain skills, knowledge and attitudes concerning teamworking from their experience on the job, throughout their year of services. Therefore, in order to ensure effective interprofessional team performance, team members require a comprehensive understanding of their own professional roles and the roles of their colleagues in a more structured way. Professionals have lack of skills to work as an effective team member and collaborative attitudes, because the teamwork has not been included in any of their pre- or post-qualification training. There is an assumption that professionals will intuitively know how to work collaboratively. However, there are evidences related to continued failures in communication and collaboration across health care systems.

Therefore the educational institutes in Greece have to include teamwork sessions and workshops in their curriculum of pre- and post-qualification programs, to help students understand the principles of teamwork and collaboration, as well as to be able to perform effectively in an interprofessional team, before they will be members of a health care organization.

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