

The Effect of Socio-Cultural Characteristics on the Effectiveness of Teamwork: A Study in the Gülhane Military Medical Faculty Training Hospital

Özay Çelen · Abdulkadir Teke · Necmettin Cihangiroglu

Received: 26 December 2013 / Accepted: 17 August 2014 / Published online: 27 September 2014
© Springer Science+Business Media New York 2014

Abstract In this study, our aim was to determine the effect of the socio-cultural characteristics of health workers on the effectiveness of teamwork. In this study, a questionnaire method was used for data collection. To this end, a scale was first developed to assess the effectiveness of teamwork. Setting and Participants: The study was conducted in 34 departments/divisions within the GMMF Training Hospital with 423 health workers. “Specialist opinion” was used to determine the content validity of the “Teamwork Effectiveness Scale” developed for this study, while “factor analysis” was used to test the scale’s construct validity. Cronbach Alpha values were calculated to test the reliability of the scale. To determine the effect of socio-cultural characteristics on the effectiveness of teamwork, the “Kruskal-Wallis” test, the “Mann-Whitney U” test and “Logistic Regression Analysis” were used within the context of the study. Based on the study results, it was observed that “assignment, “age” and “status” did not have an effect on the effectiveness of teamwork ($p>0.05$). On the other hand, a significant and negative relationship was observed between “the obligation to perform compulsory service” and the attitudes that considered teamwork to be effective ($p=0.029$). Similarly, a difference was identified between the workers’ attitudes towards the effectiveness of teamwork depending on the size of the place of assignment ($p=0,042$). It was thus observed that the “effectiveness of teamwork” was affected by the presence or absence of the “obligation to perform compulsory service” and by the “size of the place of assignment.

Keywords Teamwork · Effectiveness of teamwork · Health professionals · Hospital

This article is part of the Topical Collection on *Systems-Level Quality Improvement*

Ö. Çelen (✉) · A. Teke · N. Cihangiroglu
Elazığ Military Hospital, Elazığ, Turkey
e-mail: ocelen71@yahoo.com

Introduction

The current approach in international and national work life is that organizations require not only the efforts of charismatic administrators or clever managers, but also the skill and creativity of all its workers [1]. For this reason, organizations (companies, institutions, etc.) nowadays place considerable emphasis on teamwork in order to gain advantage against competition, to resolve problems through cooperation, and to benefit to a greater extent from the creativity of their workers [2]. Especially in the past 20 years, teamwork has been the subject of increasing interest for organizations [3].

In simple terms, the team describes a group of individuals with a common purpose and goal; although these individuals may have different tasks and skills, they carry out these tasks and skills together to achieve their common goal [4]. The term healthcare team is defined as a group of health professionals working for a common purpose and making complementary contributions to patient care [5]. Teamwork, on the hand, describes the work and activities conducted jointly by worker and the management in order to continuously develop business processes and management, and to identify the activities and goals of the organization. [6].

It is relatively easy to establish a certain level of teamwork and cooperation among a group of individuals. The main difficulty, however, lies in achieving effective teamwork [7]. The effectiveness of a team can be defined as the extent to which it can perform its assignments at the required standard and level of quality [8].

Based on information obtained from the literature, the dimensions that determine the effectiveness of teamwork can be considered and evaluated under the following dimensions

[7, 9]: “*Team Atmosphere*,” “*Common Purpose*,” “*Team Structure and Roles*” and “*Team Functioning*” These dimensions are briefly described below.

Team atmosphere: Team atmosphere is constituted of many components. The willingness to help one another and to engage in voluntary “information sharing” reflects the level of “cooperation” within the team [10]. The sharing of all types of information between the team members in an open and intelligible manner, and without any distrust being expressed, is indicative of strong communication between the team members [11]. Another factor that reflects the team atmosphere is “trust” [12]. Mutual trust and respect is the basis for forming an effective team [13]. A high level of trust must exist between the team members. Team members must trust the honesty, personality and skills of their teammates [14]. Another component that determines the team atmosphere is “team solidarity,” which describes the team’s ability to act with a sense of unity and team spirit. Team solidarity also describes the team’s ability to draw members to itself, and to motivate and convince members to stay within the team [15]. Another component is the “team norm.” A team norm represents a set of standards that are shared by the team members, and which shape their behaviour [16].

Common purpose One of the most important characteristics of effective teams is their possession of a common and exciting purpose. As the individuals who constitute the team may each have a different personal goal, instilling such excitement and sentiments within a team is actually not an easy task [12].

Leadership Team leadership necessitates the ability to ensure that a group of individuals are able to work together as a team and to focus their efforts to a common goal. The most important outcome of good leadership is an effective team [7].

Team structure and roles Within a team, both new and old members wish to know what other workers expect from them, and also what they can expect from other workers. The set of expectations defined for workers within a business or for members within a team actually defines their “role” [9]. The distribution and organization of roles within a team determines the team structure. Roles should be clearly defined within a team, and it should be possible to evaluate the performances of team members without resorting to accusations or apologies [12]. For effective teamwork, each worker should assume responsibility for both his/her personal assignments and the tasks of the team [17].

Team functioning “Conflicts” and their resolution are the main determinants of a team’s functioning. The main causes of conflict within a team includes the increasing lethargy that might result from working together for long periods of time,

the possibility of certain team members displaying an unfavourable attitude towards teamwork, the presence of team members who prefer complimenting others rather than performing actual work, the injustices that might take place concerning rewards/awards, and the personal disputes that might occur between team members [18]. Another component that reflects team functioning is “participation.” Participation is an essential component for the proper functioning of a team [7].

Health services possess characteristics are different and distinctive; these characteristics include a range of activities that are more diverse than many other areas of service, a greater number and complexity of problems that are encountered during the provision of such services, a higher expectation regarding its outputs, the ability to obtain effective results from medical care, and the ability to respond rapidly to customer demands and changes. These distinctive characteristics render teamwork necessary and essential for health services [8, 19] Health services teams represent far more than a group of individuals working together: In health services, the team represents a complex service provider composed of individuals trained and professionalized in different areas, and which uses different approaches, means and methods for its patients [20]. Health institutions possess complex organizational systems, and represent environments in which personnel from many different occupational groups work together and provide continuous services. As such, ensuring continuity in services in these institutions with extremely complex organizational structures is only possible through effective teamwork [21].

First of all, it is possible to say that the number of studies investigating teamwork in health services is fairly limited. Studies conducted for investigating teamwork in health services include the following studies:

The first of these studies is Didem Moroğlu’s postgraduate thesis that aimed to determine the views of health workers regarding teamwork. This study was conducted in 2006 with 411 health workers (physicians, nurses, midwives, health staff, physiotherapists, etc.) assigned at the Cumhuriyet University Hospital [22]. Another study was Gayef’s postgraduate thesis entitled “The Effect of Leadership Approaches Implemented in Private Hospitals on Senior Management’s Perception of Teamwork and Organizational Climate,” which was conducted in 2006 [21]. Goni, on the other hand, conducted a study on the health teams (31 teams) of primary care health services in the independent Spanish region of Navarre, and investigated the relationship between team characteristics and team performance [23]. Makary et al. conducted a study on health workers from the surgery rooms of 60 hospitals in the United States, and compared the level of teamwork between different surgery room workers [24]. Kerr conducted a study to demonstrate the benefits of team-based approaches in

medical error management [25]. Finn et al. investigated the effect of teamwork on health services within the context of two original studies performed with surgery room clinical personnel and recording secretaries [26].

The purpose of this study was to investigate the effects of worker's socio-cultural characteristics on the effectiveness of teamwork.

Materials and methods

The study was conducted in the Gülhane Military Medical Faculty (GMMF) Training Hospital. To evaluate the departments/divisions of the GMMF Training Hospital as a fully vertical or sectional health team, our approach was based on the prerequisite that doctors, nurses, technicians, other health personnel and the administrative/support personnel worked together. For this reason, a small number of departments/divisions that did not include the abovementioned groups (such as Medical Ecology and Hydroclimatology, Geriatrics) were excluded from the study. Thus, a total of 34 departments/divisions within the GMMF Training Hospital were included into the study.

During the study period, a total 2025 personnel were assigned at the mentioned departments/divisions. In other words, the study population consisted of 2025 personnel. It was considered that, instead of attempting to reach the entire study population, sufficiently representative data could be obtained within a shorter period of time and with less effort by performing selection through a sampling method. Based on the assumption that variables evaluated within the context of this study could demonstrate significant differences according to the place of assignment, personnel assignment and status [27], the “*Stratified Sampling Method*” was utilized. The study sample was determined as 463 from the study population, within a 95% confidence limit and with a 4% margin of error. However, due to some of the health workers being unwilling to participate, being at rest or on leave, or becoming assigned to another institution, data could be collected from 428 individuals. Thus, the study sample was within a 95% confidence limit and with a 4.2% margin of error.

Data collection tool

In this study, a questionnaire method was used for data collection. To this end, a scale was first developed to assess the effectiveness of teamwork. To assess the effectiveness of teamwork, the scale was developed by reviewing the existing literature on teamwork; in this process, we especially benefited from the 50 item “*Team Effectiveness Scale*” [28] previously used by Matt M. Starcevich. The Teamwork

Effectiveness Scale consisted of 22 items and was based on a 5 Likert-type design (1=Strongly Disagree, 5=Strongly Agree).

Data collection

The ethical and administrative approvals required by the legal regulations for studies to be conducted within the Gülhane Military Medical Academy (GMMA) were obtained as necessary.

The questionnaires were administered between 28 May 2010 and 18 June 2010. The questionnaires were provided to the 460 individuals within the sample group by mailing them in envelopes to each person. A copy of the approval letter for the study, as well as a letter written for the recipient of the questionnaire, was also added to this envelope. One week after the questionnaires were received by the study group, reminder e-mails were sent to personnel whose e-mail addresses were available. Additional personnel corresponding to 10% of the study sample (46 individuals) were also included into the study to compensate for individuals who were unwilling to participate or could not be reached due to leave, rest, or change in assignment. Data could be obtained from a total of 428 individuals.

Data analysis

The *SPSS 15.0* (Software Statistical Package for the Social Science) program was used for data analysis. Whether the data displayed normal distribution was evaluated with the Shapiro-Wilk test. The analysis results demonstrated that the data did not conform to normal distribution. As the data did not conform to normal distribution, non-parametric tests were used within the context of the study. Descriptive statistics were first obtained for all study data. Median and Interquartile Range (IQR) was used in showing descriptive statistics for variables identified through measurements, while number (n) and percentage (%) values were used in showing descriptive statistics for variables identified through counting. “*expert opinion*” was used to determine the content validity of the Teamwork Effectiveness Scale developed for this study, while “*factor analysis*” was used to test the scale's construct validity. *Cronbach Alpha* values were calculated to test the reliability of the scale. Whether the effectiveness of teamwork varied according to the socio-cultural characteristics of the workers was analyzed with the “*Kruskal-Wallis*” test for multiple comparisons, and with the “*Mann-Whitney U*” test for paired comparisons. Socio-cultural characteristics which, based on one-way comparisons, were identified as leading to significant differences in the effectiveness of teamwork were further evaluated by “*Logistic Regression Analysis*.” Regarding

statistical decisions, a value of $p < 0.05$ was considered as an indication of a significant difference.

Results

Information regarding the *age, civil status, gender, assignment, status, the place of assignment, time worked in the Turkish Armed Forces (TAF), time worked at the GMMF Training Hospital, status regarding the obligation to perform compulsory service, and the size of the place of assignment* were collected for individuals included into the sample group. To ensure that statistical analyses could be performed more easily and accurately, certain socio-cultural characteristics were presented by organizing them under certain groups (Table 1).

Testing the validity and reliability of the scales

Two characteristics are fundamental for accurate assessments and for assessments tools: “Reliability” and “Validity” [29].

“Factor analysis” was used to test the validity of the developed scale. The aim of this analysis was to determine whether the items that assessed the same factor could be considered together, and whether these items reflected the organizational structure [29]. *Factor analysis* was performed by “varimax” rotation and by taking into account values with factor loads above 0.50. Item 16 on the scale had a factor load below 0.50, and was loaded equally onto the factors. Moreover, the removal of this item from the scale led to an increase from 63.20% to 65.14% for the description percentage of the total variance. As the removal of this item did not change the reliability of the “*teamwork effectiveness*” scale (Cronbach Alpha=0.955), the decision was taken to remove item 16 from the scale. The KMO value (0.96) confirms that the sample is sufficient for factor analysis. The results of the Bartlett test demonstrated that the correlation between the variables was statistically significant ($X^2=6335.28, p < 0.001$).

The “*Teamwork Effectiveness*” scale consisted of the following dimensions: “*Team Atmosphere and Functioning*” (Factor 1), “*Leadership*” (Factor 2) and “*Common Purpose*” (Factor 3) (Table 2). It is possible to say that the results of the factor analysis were in agreement with the conceptual dimensions of *Teamwork Effectiveness*, which are “*Common Purpose*,” “*Team Atmosphere*,” “*Team Structure and Roles*,” “*Team Functioning*” and “*Leadership*.” As such, while items related to the “*Leadership*” and “*Common Purpose*” dimensions were grouped in accordance with the conceptual structure, items that were conceptually related to “*Team Atmosphere*,” “*Team Structure and Roles*,” “*Team Functioning*” were grouped under the “*Team Atmosphere and Functioning Dimension*.”

Cronbach Alpha values were used to test the reliability of the scale. Certain sources describe that a *Cronbach Alpha* value of 0.8 and above is indicative of a scale’s reliability [27]. Generally, *Cronbach Alpha* values between 0.00-0.39 are interpreted as an indication that “*the scale is unreliable*,” values between 0.40-0.59 as an indication that “*the scale is of low reliability*,” values between 0.60-0.79 as an indication that “*the scale is fairly reliable*,” and values between 0.80-1.00 as an indication that “*the scale is highly reliable*” [30, 31]. The Cronbach Alpha values were 0.96 for “*teamwork effectiveness*,” 0.93 for the “*team atmosphere and functioning*” sub-dimension, 0.93 for the “*leadership*” sub-dimension, and 0.85 for the “*common purpose*” sub-dimension. These values indicated that the scale was “*highly reliable*” (Table 3).

Descriptive results

It was considered that the responses “*strongly agree*” and “*agree*” from participating health workers regarding “*teamwork effectiveness*” were indicative of the presence and perception of effective teamwork. As such, nearly two-thirds (67.3%) of the participants described the existence of effective teamwork in their respective units. An evaluation of the dimensions of “*teamwork effectiveness*” revealed that “*team atmosphere and functioning*” was scored lower (58.1%) in comparison to the other dimensions. The large majority of the health workers (74.5%) had a positive perception regarding “*common purpose*.” Similarly, the majority of the workers (69.2%) believed that there was effective “*leadership*” for teamwork in their departments/divisions.

The effect of socio-cultural characteristics on the effectiveness of teamwork

To demonstrate the effects of socio-cultural characteristics on “*teamwork effectiveness*” and its sub-dimensions, one-way comparisons were first performed. Based on the one-way comparisons, it was determined that:

- “*Teamwork Effectiveness*” displayed differences according to *age, status, occupation (assignment), compulsory service obligation, and the size of the place of assignment* ($X^2=12.084, p=0.007$; $X^2=11.097, p=0.004$; $X^2=19.722, p=0.001$; $Z=2.554, p=0.011$; and $X^2=8.969, p=0.011$, respectively).
- The “*Team Atmosphere and Functioning*” dimension displayed differences according to *age, gender, status, occupation (assignment), compulsory service obligation, total time worked, and the size of the place of assignment* ($X^2=14.083, p=0.003$; $Z=1.966, p=0.049$; $X^2=15.535$,

Table 1 Socio-cultural characteristics of participants

Characteristics		n	%
Age	≤ 30	117	27.6
	31-35	126	29.7
	36-40	90	21.2
	≥ 41	91	21.5
Civil status	Married	309	72.7
	Single	116	27.3
Gender	Women	233	54.7
	Men	193	45.3
Status	Officer	107	25.0
	Non-Commissioned Officer (NCO)	41	9.6
	Civil Servant	280	65.4
Assignment	Physician	102	23.8
	Nurse	146	34.1
	Other Staff	180	42.1
Compulsory service obligation	Yes	115	26.9
	No	312	73.1
The place of assignment	Surgical units	200	46.8
	Internal units	153	35.8
	Laboratory and x-ray units	74	17.3
Time worked in The TAF	≤ 5	66	15.6
	6-10	121	28.5
	11-15	109	25.7
	16-20	74	17.5
	≥ 21	54	12.7
Time worked at the GMMF training hospital	≤ 5	172	40.6
	6-10	130	30.7
	≥ 11	122	28.8
The size of the place of assignment	Small	73	17.1
	Medium	154	36.0
	Large	201	47.0

$p < 0.001$; $X^2 = 19.675$, $p = 0.001$; $Z = 2.694$, $p = 0.007$; $X^2 = 9.933$, $p = 0.042$; $X^2 = 6.168$, $p = 0.046$, respectively).

- The “Leadership” dimension displayed differences according to *gender*, *status*, *occupation (assignment)*, *compulsory service obligation*, and *the size of the place of assignment* ($Z = 2.144$, $p = 0.032$; $X^2 = 6.856$, $p = 0.032$; $X^2 = 22.381$, $p < 0.001$; $Z = 2.482$, $p = 0.013$; $X^2 = 10.506$, $p = 0.005$, respectively).
- The “Common Purpose” dimension displayed differences according to *age and occupation (assignment)* ($X^2 = 12.492$, $p = 0.006$; $X^2 = 11.597$, $p = 0.021$, respectively).

Socio-cultural characteristics which, based on one-way comparisons, were identified as leading to differences in the effectiveness of teamwork were then evaluated by “Logistic Regression Analysis.”

Among the socio-cultural characteristics that were identified based on one-way comparisons as leading to significant

differences in teamwork effectiveness; “age,” “assignment (occupation),” “status,” “compulsory service obligation” and the “size of the place of assignment” were included into the model, and their effect on teamwork effectiveness was examined (Table 4). The model in question was found to be adequate ($X^2 = 7.833$, $p = 0.450$), and its parameters were significant ($X^2 = 18.897$, $p = 0.042$). The rate of accurate classification by the model was determined as 71.5%.

It was observed that “assignment (occupation),” “age” and “status” did not have an effect on the *effectiveness of teamwork* ($p > 0.05$).

On the other hand, a significant and negative relationship was identified between “the obligation to perform compulsory service” and the attitude that considered teamwork to be effective ($p = 0.029$). In comparison to the individuals with “the obligation to perform compulsory service,” individuals without this obligation were 0.419 times less likely to have a favourable view on teamwork.

Table 2 Teamwork effectiveness Dimensions and Factor Loadings

Factors	Questions	Factor 1	Factor 2	Factor 3
Common Purpose	Q1			0.73
	Q2			0.81
	Q3			0.72
	Q4			0.73
Team atmosphere and functioning	Q5	0.55		
	Q6	0.74		
	Q7	0.69		
	Q8	0.68		
	Q9	0.73		
	Q10	0.63		
	Q11	0.65		
	Q12	0.54		
	Q13	0.60		
	Q14	0.60		
	Q15	0.70		
Leadership	Q17	0.56		
	Q18		0.72	
	Q19		0.81	
	Q20		0.82	
	Q21		0.79	
	Q22		0.77	
Total		5.90	4.38	3.40
% of Variance		28.06	20.87	16.21
KMO=0.96				
Bartlett's Test of Sphericity=6335.28, p<0.001				

Similarly, a difference was identified between the workers' attitudes towards the effectiveness of teamwork depending on the *size of their place of assignment* ($p=0.042$). In comparison to the individuals working in "smaller" units, individuals working in "larger" units were 0.514 times less like to have a favourable view on *teamwork effectiveness*.

Among the socio-cultural characteristics that were identified based on one-way comparisons as leading to significant differences in "*team atmosphere and functioning*"; "*age*," "*assignment (occupation)*," "*status*," "*the obligation to perform compulsory service*" and the "*size of the place of assignment*" were included into the model, and their effect on *team atmosphere and functioning* was examined (Table 5). The model that evaluated the effect of socio-cultural

characteristics on "*team atmosphere and functioning*" was found to be adequate ($X^2=6.228$, $p=0.622$), and its parameters were significant ($X^2=27.051$, $p=0.028$). Rate of accurate classification by the model was determined as 65.8%

A significant ($p=0.050$) and positive relationship was also identified between *age groups* and attitudes that considered "*team atmosphere and functioning*" as being effective. In comparison to individuals who were "30 years-old or younger," individuals who were "41 years-old and older" were 3.207 times more likely to have a favourable view on *team atmosphere and functioning*.

Another factor that was identified as having an effect on attitude towards team atmosphere and functioning within the units was "*gender*" ($p=0.035$). In comparison to men, women were 2.148 more likely to have a favourable view on *team atmosphere and functioning*.

"*Assignment*," "*compulsory service obligation*," "*status*," "*size of the place of assignment*" and "*time worked at the TAF*" did not lead to significant differences in *team atmosphere and function* ($p>0.05$).

The model which, among the socio-cultural characteristics that had an effect on the "*leadership*" dimension, included the effects of "*assignment*," "*compulsory service obligation*,"

Table 3 Cronbach Alpha Values

Scale and dimensions	n	Cronbach alpha values
Teamwork effectiveness	21	0,96
Team atmosphere and functioning	12	0,93
Leadership	5	0,93
Common purpose	4	0,85

Table 4 Effect on teamwork effectiveness of socio-cultural characteristics

Independent Variables	B	S.E	Wald	Sig.	Exp (B)	95% C.I. for EXP (B)	
						Lower	Upper
Age							
≤30 (<i>Reference</i>)			4.855	0.183			
31–35	−0.219	0.290	0.568	0.451	0.803	0.455	1.419
36–40	−0.022	0.333	0.004	0.948	0.979	0.509	1.881
≥41	0.571	0.395	2.098	0.148	1.771	0.817	3.837
Assignment							
Physician (<i>Reference</i>)			0.673	0.714			
Nurse	0.536	1.175	0.208	0.648	1.709	0.171	17.089
Other Staff	0.714	1.186	0.362	0.547	2.042	0.200	20.891
Compulsory service obligation							
Yes (<i>Reference</i>)							
No	−0.871	0.398	4.784	0.029	0.419	0.192	0.914
Status							
Officer (<i>Reference</i>)			2.376	0.305			
NCO	−1.147	1.204	0.907	0.341	0.318	0.030	3.365
Civil Servant	−0.519	1.160	0.200	0.654	0.595	0.061	5.779
The size of the place of assignment							
Small (<i>Reference</i>)			4.910	0.086			
Medium	−0.308	0.344	0.804	0.370	0.735	0.374	1.441
Large	−0.666	0.327	4.151	0.042	0.514	0.270	0.975
Constant	1.903	0.430	19.542	<0.001	6.705		

“status,” “size of place of assignment” and “gender” was found to be adequate ($X^2=3.622$, $p=0.890$); however, the model was not significant ($p>0.05$). None of the socio-cultural characteristics of the workers had an effect on the “leadership” dimension of teamwork (Table 6).

The model which, among the socio-cultural characteristics that had an effect on “common purpose”, included the effects of “assignment” and “age” was found to be suitable ($X^2=5.394$, $p=0.494$) “status,” “size of place of assignment” and “gender” was found to be adequate ($X^2=3.622$, $p=0.890$); however, the model was not significant ($p>0.05$). None of socio-cultural characteristics of the workers had an effect on the “common purpose” dimension of teamwork (Table 7)

Discussion

An evaluation of the literature revealed that common characteristics of teamwork effectiveness could be grouped under the “Team Atmosphere,” “Common Purpose,” “Leadership,” “Team Structure and Roles” and “Team Functioning” dimensions. In this study, teamwork effectiveness was evaluated based on the results of the factor analysis with respect to the three dimensions “team atmosphere and functioning,” “common purpose” and “leadership.” It is possible to say that the results for these dimensions were in agreement with the

literature. In a previous study, nearly all participating health personnel considered these three dimensions as the characteristics of an effective team [22].

However, the number of studies assessing and demonstrating the extent of these characteristics’ effectiveness is very limited. One such study was conducted by Makary et al. with 2135 surgery room workers from 60 hospitals in the United States; this study determined that workers generally considered the level of teamwork in their units to be high [24]. In a study conducted by Flin et al. in the surgery rooms of 11 hospitals in Scotland, workers described a good level of teamwork in their units [32]. In the study of Rafferty and Aiken conducted with 5006 nurses assigned in 32 hospital across the United Kingdom, a “moderate” level of teamwork was identified between the workers (26). We also observe other result and findings in the literature. For example, in two separate studies of Finn et al. conducted with surgery room workers and recording secretaries, workers generally considered teamwork as the solution for problems encountered in health services, but also expressed that the expected benefits of teamwork could not be realized in their units [26]. In other words, effective teamwork could not be achieved in these study locations. As an interesting finding, Kerr determined in his study that teamwork not only failed to decrease the number of mistakes, but also contributed to making mistakes by decreasing concentration in individuals. Based on

Table 5 Effect on team atmosphere and functioning of socio-cultural characteristics

Independent variables	B	S.E	Wald	Sig.	Exp (B)	95% C.I. for EXP (B)	
						Lower	Upper
Age							
≤30 (<i>Reference</i>)			6.364	0.095			
31–35	−0.057	0.337	0.028	0.867	0.945	0.488	1.829
36–40	0.635	0.440	2.083	0.149	1.886	0.797	4.465
≥41	1.165	0.594	3.855	0.050	3.207	1.002	10.263
Assignment							
Physician (<i>Reference</i>)			1.037	0.595			
Nurse	−1.022	1.034	0.975	0.323	0.360	0.047	2.734
Other Staff	−0.882	1.012	0.759	0.383	0.414	0.057	3.009
Compulsory service obligation							
Yes (<i>Reference</i>)							
No	−0.609	0.387	2.478	0.115	0.544	0.255	1.161
Status							
Officer (<i>Reference</i>)			0.266	0.875			
NCO	0.367	1.046	0.123	0.725	1.444	0.186	11.222
Civil Servant	0.119	0.965	0.015	0.902	1.126	0.170	7.464
The size of the place of assignment							
Small (<i>Reference</i>)			2.250	0.325			
Medium	−0.014	0.314	0.002	0.965	0.986	0.533	1.826
Large	−0.330	0.300	1.210	0.271	0.719	0.399	1.294
Gender							
Men (<i>Reference</i>)							
Women	0.765	0.362	4.458	0.035	2.148	1.056	4.369
Time worked in the TAF							
≤5 (<i>Reference</i>)			1.514	0.824			
6–10	−0.195	0.372	0.276	0.600	0.823	0.397	1.705
11–15	−0.125	0.440	0.081	0.776	0.883	0.372	2.091
16–20	−0.584	0.571	1.045	0.307	0.558	0.182	1.709
≥21	−0.389	0.695	0.312	0.576	0.678	0.174	2.648
Constant	1.237	0.443	7.804	0.005	3.444		

this observation, Kerr concluded that teamwork is not a beneficial or effective method for health services [25]. In this study, the majority of the workers (67.3%) described the existence of *effective teamwork* in their units. Nearly three quarters of the workers described *effective teamwork* in their units with regards to the dimensions “*common purpose*” and “*leadership*” (respectively 74.5% and 69.2%). The ratio of workers who believed “*team atmosphere and functioning*” to the effective and applicable in their units was relatively lower (58.1%). In other words, *team atmosphere and functioning* at the GMMF Training Hospital was lower in comparison to the other dimensions.

It was determined within the context of this study that the *teamwork effectiveness* and its sub-dimensions of “*leadership*” and “*common purpose*” did not vary according to age, while the “*team atmosphere and functioning*”

dimension varied according to age. Individuals who were 41 years of age or older had a more positive view of the team atmosphere and functioning within their unit. Goni [23] determined that age did not affect *teamwork effectiveness*. On the other hand, it is expected that teams with members of the same age might lead to an increase in “*solidarity*,” which is an important factor for *team atmosphere and functioning* [9]. These results support the findings of our study.

Certain studies have described that *teamwork effectiveness* does not vary according to gender (26, 29), while other studies have demonstrated gender as a cause of difference in the effectiveness of teamwork [33]. For example, Karahan [34] view gender differences as one of the obstacles for teamwork. Furthermore, it has been described that, as one of the determinants of team atmosphere, communication is also affected by gender [33]. In our study, it was determined that *the*

Table 6 Effect on leadership of socio-cultural characteristics

Independent variables	B	S.E	Wald	Sig.	Exp (B)	95% C.I. for EXP (B)	
						Lower	Upper
Assignment							
Physician (<i>Reference</i>)			5.736	0.220			
Nurse	0.168	1.226	0.019	0.891	1.184	0.107	13.073
Other Staff	0.693	1.211	0.327	0.567	1.999	0.186	21.454
Compulsory service obligation							
<i>Yes (Reference)</i>							
No	-0.557	0.329	2.854	0.091	0.573	0.300	1.093
Status							
<i>Officer (Reference)</i>							
NCO	-1.239	1.269	0.954	0.329	0.290	0.024	3.481
Civil Servant	-0.638	1.144	0.311	0.577	0.528	0.056	4.977
The Size of the place of assignment							
<i>Small (Reference)</i>							
Medium	-0.043	0.327	0.017	0.896	0.958	0.504	1.820
Large	-0.353	0.311	1.284	0.257	0.703	0.382	1.294
Gender							
<i>Men (Reference)</i>							
Women	-0.033	0.438	0.006	0.940	0.967	0.410	2.283
Constant	1.588	0.369	18.502	<0.001	4.893		

teamwork effectiveness sub-dimensions of “leadership” and “common purpose” did not vary according to gender, while the “*team atmosphere and functioning*” variable varied according to gender. Compared to men, women had a more positive view regarding *team atmosphere and functioning* within their units.

In our study, we observed that workers with the obligation to perform compulsory service considered teamwork to be more effective than workers without such obligations. However, no differences were identified with respect to the sub-dimensions.

In Magid et al.’s [35] study conducted in emergency services, no differences were identified with regards to

the level of teamwork between larger and smaller wards. On the other hand, certain studies from the literature have demonstrated that teams consisting of an average of 7–12 individuals are the most effective, while larger teams lead to a decrease in effectiveness [10, 16, 36]. Furthermore, many studies have shown that larger teams experience greater difficulties in communication, coordination and relations between personnel, which are the defining characteristics of the team atmosphere. Studies also show a negative relationship between the team size and the clarity of and adherence to team purposes [33]. In brief, larger teams contribute to a decrease in effectiveness. Our study has also demonstrated that *teamwork*

Table 7 Effect on common purpose of socio-cultural characteristics

Independent variables	B	S.E	Wald	Sig.	Exp (B)	95% C.I. for EXP (B)	
						Lower	Upper
Age							
<i>≤30 (Reference)</i>							
31–35	-0.110	0.317	0.121	0.728	0.896	0.481	1.668
≥36	0.297	0.323	0.848	0.357	1.346	0.715	2.534
Assignment							
<i>Physician (Reference)</i>							
Nurse	0.379	0.324	1.369	0.242	1.460	0.774	2.754
Other staff	0.603	0.313	3.728	0.054	1.828	0.991	3.373
Constant	0.987	0.323	9.347	0.002	2.683		

effectiveness decreases in larger teams. On the other hand, no differences were identified for the sub-dimensions. The literature describes that differences associated with hierarchy and authority affect team work, and suggests that the perception of doctors as “ranking higher” than other health personnel might also influence the dynamics of team work [37, 38]. As a result, the level of team work displayed by workers is expected to differ according to occupation. Results from numerous studies that have been conducted to date on this subject have demonstrated the effect of occupation on team work [24, 25, 39–44]. Similarly, Finn et al. [25] described that status is a significant obstacle for proper team work, and that the level of team work can differ according to status.

The other socio-cultural characteristics did not have an effect on *teamwork effectiveness* and its sub-dimensions. Our study results differ from the literature in that “occupation,” “status” and “place of assignment” did not lead to any differences in *teamwork effectiveness*.

In sum, we observed that “*teamwork effectiveness*” was influenced by the “compulsory service obligations” of the workers and the “size of the place of assignment.” We also observed that the “*team atmosphere and functioning*” varied according to “age” and “gender,” while the *teamwork effectiveness* sub-dimensions of “*leadership*” and “*common purpose*” did not vary according to socio-cultural characteristics.

Nowadays, an organization’s ability to take advantage of new opportunities is directly related to its ability to effectively organize and manage talented individuals within its ranks. Within the context of present-day changes and trends, it has become mandatory for organizations to restructure themselves and their projects by placing greater emphasis on team work [6]. Some of the problems in health care may have been alleviated by improved teamwork among health professionals [45].

As health services involve labour-intensive activities that are mostly human-oriented, it is possible to state that the attitudes and behaviours of workers plays an important role in the provision of effective and good quality health services. In other words, the attitudes of workers in health institutions and organizations have a very determining role on health services. For this reason, decision-makers and administrators should continuously monitor the “organizational behaviour” of health workers, and develop new measures accordingly. This study presents data and results that are important for decision-makers of the military health services system. In this context;

Based on the difficulty in ensuring effectiveness in large teams, larger departments/divisions can be further divided into sub-branches, or into several units that are organizationally and functionally independent from one another (For example, the “*Cardiology 1*,” “*Cardiology 2*” units).

- Greater emphasis could be placed on “*activities that contribute to the team spirit*” (e.g. celebration of successful events, social meetings, etc.).
- Workers could be encouraged by the unit and hospital managers to engage in activities that “*contribute to their development*,” and further emphasis could be placed on ensuring that workers “*develop their creativity and risk-taking skills*.”
- Workers could be given the opportunity to express their views and thoughts more *easily and comfortably*.
- Efforts could be made to improve *communication and cooperation* between different departments and divisions.

This study was conducted only at a single hospital located within the Ankara Province. For this reason, the study results cannot be generalized for all hospitals in Turkey. In addition, the hospital in which the study was conducted is a training hospital belonging to the Turkish Armed Forces. Hence, the study results may not be applicable for public, university, and private hospitals.

References

1. Cetin, C., *Leadership styles, change management and teamwork*. Istanbul Chamber of Commerce Publications, Istanbul, 2009.
2. Bingöl, D., *Human resource management*. Arkan, İstanbul, 2006.
3. Wilson, F. M., *Organizational behaviour and work: A critical introduction*. Oxford University Press, New York, 2004.
4. Michalopoulos, A., and Michalopoulos, H., Management’s possible benefits from teamwork and the nursing process. *Nurse Leader* 4(3): 52–55, 2006.
5. Househ, M. S., and Lau, F. Y., Collaborative technology use by healthcare teams. *J Med Syst* 29(5):449–461, 2005.
6. Ince, M., Beduk, A., and Aydogan, E., The effective leadership skills for teamwork in organizations. *Selcuk University Journal of Social Sciences* 11:423–446, 2004.
7. Adair, J., *Effective teambuilding (in Turkish)*. Halime Gürbüz, Babiali Culture Publication, Istanbul, 2005.
8. Kavuncubasi, S., *Hospital and health organizations management*. Siyasal Kitabevi, Ankara, 2000.
9. Schermerhorn, J. R., Hunt, J. G., and Osborn, R. N., *Organizational behavior*. Wiley, New York, 2000.
10. Mejia, L. R. G., Balkin, D. B., and Cardy, R. L., *Management*. McGraw-Hill, Boston, 2005.
11. Eren, E., *Organizational behavior and psychology of management*. Beta, İstanbul, 2008.
12. Baltas, A., *Teamwork and leadership*. Remzi Kitabevi, Istanbul, 2007.
13. McConnell, C. R., *The effective health care supervisor*. Jones and Bartlett Publishers, Boston, 2003.
14. Gibson, J. L., Ivancevich, J. M., Donnelly, J. H., and Konopaske, R., *Organizations: Behavior, structure, processes*. Irwin/McGraw-Hill, Boston, 2009.
15. Simsek, M. S., Akgemci, T., and Celik, A., *Introduction to behavioral sciences and organizational behavior*. Gazi Kitabevi, Ankara, 2008.
16. Daft, R. L., *Management*. The Dryden Press, Orlando, 2000.

17. Smith, K. A., *Teamwork and project management*. McGraw Hill, New York, 2004.
18. Straub, J. T., *Building and leading teams (in Turkish)*. Savas Senel, Hayat, Istanbul, 2002.
19. Buchbinder SB, Thompson JM (2007) Teamwork, In: Sharon B. Buchbinder, Nancy H. Sanks (Eds.) *Introduction to health care management*. Jones and Bartlett, USA, pp 303-322
20. Drinka, T. J., and Clark, P. G., *Health care teamwork: Interdisciplinary practice and teaching*. Greenwood Publishing, USA, 2000.
21. Gayef A (2006) The effect of leadership approaches on subordinates' perceptions on teamwork and organizational climate in private hospitals. Dissertation, University of Istanbul
22. Moroğlu D (2007). The view of health care personnel work at the Cumhuriyet University Hospital about team working. Dissertation, University of Cumhuriyet
23. Kerr, A., A problem shared? Teamwork, autonomy and error in assisted conception. *Soc Sci Med* 69:1741–1749, 2009.
24. Makary, M. A., Sexton, J. B., Freischlag, J. A., Holzmueller, C. G., Millman, E. A., Rowen, L., and Pronovost, P. J., Operating room teamwork among physicians and nurses: Teamwork in the eye of the beholder. *J Am Coll Surgeons* 202(5):746–752, 2006.
25. Finn, R., Learmonth, M., and Reedy, P., Some unintended effects of teamwork in healthcare. *Soc Sci Med* 70:1148–1154, 2010.
26. Rafferty, A. M., Ball, J., and Aiken, L. H., Are teamwork and Professional autonomy compatible, and do they result in improved hospital care. *Qual Saf Health Care* 10(II):32–37, 2001.
27. Sumbuloglu, K., Sumbuloglu, V., and Akyüz, K., *Survey Methodology of Scientific Research*. Songur Publication, Ankara, 2005.
28. Starcevich MM. A model of an effective team. <http://www.learningunlimited.com/uploads%5C270.pdf>. Accessed 15 December 2010
29. Karasar, N., *Scientific research method*. Nobel, Ankara, 2005.
30. Ozdamar, K., *Data analysis and statistical software packages*. Kaan Kitabevi, Eskisehir, 2004.
31. Doğan, H., Analysis of employee job satisfaction related to stress and procedural justice perceptions: An applied research in Gazi Hospital. Suleyman Demirel University. *Journal of Economics and Administrative Sciences* 10(1):301–312, 2005.
32. Flin, R., Fletcher, G., McGeorge, P., Sutherland, A., and Patey, R., Anaesthetists' attitudes to teamwork and safety. *Anaesthesia* 58:233–242, 2003.
33. Borril CS et al. (1999) The effectiveness of health care Teams in the national health service. Aston University
34. Karahan, A., Learning as a team in hospitals. Afyon Kocatepe University. *Journal of Economics and Administrative Sciences* 10(2):237–255, 2008.
35. Magid, D. J., Sullivan, A. F., Cleary, P. D., Roa, S. R., Gordon, J. A., Kaushal, R., Guadagnoli, E., Camargo, C. A., and Blumenthal, D., The safety of emergency care systems: results of a survey of clinicians in 65 US emergency departments. *Ann Emerg Med* 53(6):715–723, 2009.
36. Simsek, M. S., and Celik, A., *Management and organization*. Education Academy Publications, Ankara, 2009.
37. Ivanitskaya, L. V., Glazer, S., and Erofeev, D. A., Groups dynamics. In: Johnson, J. A. (Ed.), *Health organizations: Theory behavior and development*. Jones and Bartlett, USA, 2009.
38. Nagamine, J., Principle of good teamwork. In: McKean, S., Bennett, A. L., and Halasyamani, L. (Eds.), *Hospital medicine: Just the facts*. McGraw-Hill, USA, 2008.
39. Goni, S., An Analysis of the effectiveness of Spanish primary health care teams. *Health Policy* 48:107–117, 1999.
40. Huang, D. T., Clermont, G., Sexton, J. B., Carlo, C. A., Miller, R. G., Weissfeld, L. A., Rowan, K. M., and Angus, D. C., Perceptions of safety culture vary across the intensive care units of a single institution. *Critical Care Medicine* 35(1): 165–176, 2007.
41. Mills, P., Neily, J., and Dunn, E., Teamwork and communication in surgical teams: implications for patient safety. *Journal of American College of Surgeon* 206(1):107–112, 2008.
42. O'Leary, K. J., Wheeler, H., Szekendi, M. K., Brinton, T. S., and Williams, M. V., Teamwork on inpatient medicals units: assessing attitudes and barriers. *Quality and Safety Health Care* 19:117–121, 2010.
43. Thomas, E. J., Sexton, J. B., and Helmreich, R. L., Discrepant attitudes about teamwork among critical care nurses and physicians. *Critical Care Medicine* 31(3):956–959, 2003.
44. Grant, M. J. C., Donaldson, A. E., and Larsen, G. Y., The safety culture in a children's hospital. *Journal of Nursing Care Quality* 21(3):223–229, 2006.
45. Top, M., Physicians' views and assessments on Picture archiving and communication systems (PACS) in two Turkish public hospitals. *J Med Syst* 36:3555–3562, 2012.