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The Relationship Between Environmental Turbulence and Organizational Improvisation in Hospitals: The Moderator Role of Organizational Culture

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Abstract

Aim: In today's business environment, dynamism, uncertainty, and environmental turbulence are quite high. Organizational improvisation is seen as an effective mechanism for organizations operating in these environments to respond to demands from the environment. This study aims to examine the relationship between environmental turbulence and organizational improvisation, and also the moderator role of organizational culture (adhocracy, clan, hierarchy, and market culture).

Methods: The study used a descriptive cross-sectional design. The data were collected from 487 lower, middle, and upper-level managers working in private hospitals in Istanbul. The disproportionate stratification method was used since hospitals are not homogeneous regarding technological and financial structure, size, and human resource quality. The data was analyzed using Statistical Package for the Social Sciences 23 program through PROCESS macro.

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Results: The results show a positive relationship between environmental turbulence and organizational improvisation. Also, adhocracy, clan, and market cultures moderate the environmental turbulence and organizational improvisation relationship. As these three organizational cultures increase, the effect of environmental turbulence on organizational improvisation weakens.

Conclusion: This study indicates that environmental turbulence is an effective factor in hospitals' organizational improvisation capability. Furthermore, the moderation analysis suggests that organizational culture may be an important mechanism underlying environmental turbulence and organizational improvisation relationship.

Keywords: Environmental turbulence, organizational improvisation, organizational culture, hospital management, organizational theory

INTRODUCTION

From a modern perspective, the environment can be defined as the sum of factors outside the organization's boundaries that impact the organization (Song et al., 2021; Hatch and Cunliffe, 2013). With the influence of systems and contingency theory, the relationships between the organization, technology, and environment have started to be analysed in detail (Gemici, 2019). The environment has two main importance for organizations. The first one is that it has the inputs needed by the organization, and the second one is that it is a source of uncertainty for organizations (Ülgen and Mirze, 2018). Uncertainty in the environment has been analysed by different authors such as Burns and Stalker, Lawrence Lorsch, James Thompson, Robert Duncan, and Emery and Trist. Emery and Trist stated that universal principles and decision methods cannot be applied to all organizations and that it is necessary first to understand the environments in which organizations interact and determine their characteristics (Koçel, 2018).

Emery and Trist defined four different types of environments in this context and revealed their characteristics. These are placid randomized environment, placid clustered environment, disturbed reactive environment, and turbulent environment (Emery and Trist, 1965). The four types of environment are ranked in order of increasing complexity, and the turbulent environment is considered the most complex environment for organizations (White et al., 1984). Emery and Trist defined the turbulent environment as a rapidly changing, complex, dynamic environment with dynamic processes and no predictability (Ülgen and Mirze, 2018; Emery and Trist, 1965).

Environmental turbulence can be defined as the magnitude, speed, and unpredictability of changes in an organization's environment. As environmental turbulence increases, the environmental factors become more uncertain and unpredictable (Rego et al., 2022; Hina et al., 2021; Song et al., 2021). Today's business environment is highly dynamic and uncertain. Contingency theory states that an organization is an open subsystem within a social system and is affected by the environment. Therefore, organizations must adapt all aspects of their operations to the requirements of the external environment to ensure survival and sustainability (Song et al., 2021; Hatch and Cunliffe, 2013). Hence, in high environmental turbulence settings, organizations do not have the luxury of waiting for the appropriate and necessary information or resources to overcome a particular challenge (Akgün et al., 2007). In such environments, organizations can ignore environmental demands to change plans, try to accelerate planning and execution cycles, or take an improvised approach that merges planning and execution processes (Moorman and Miner, 1998). Improvisation is considered necessary when plans and procedures fail due to environmental turbulence. "The greatest danger in times of turbulence is not the turbulence-it is to act with yesterday's logic. -Peter Drucker" (Subudhi and Mishra, 2022). Although there is no denying the importance of planning, when faced with unexpected situations, strictly following plans and procedures, in Drucker's words, acting with yesterday's logic, can lead to paralysis of an organization's activities. Therefore, in such situations, it is important for organizations to improvise with available resources to tackle complex challenges (Wilden and Gudergan, 2015; Akgün et al., 2007).

Improvisation is the degree of closeness between the planning and execution of an activity. In this context, the shorter the time between the planning and execution of an activity, the more improvisational the activity is (Moorman and Miner, 1998). Organizational improvisation can be defined as a creative action by the organization and its members to produce the desired result within a limited time by making use of all available resources (Levallet and Chan, 2013; Crossan et al., 2005; Cunha et al., 1999; Moorman and Miner, 1998). It is an almost real-time response to an unexpected trigger. The main reason for improvisation is the lack of time for planning, but it is certainly not an irrational act or inaction. Improvisation requires action. In some situations, organizations may decide not to respond. This does not mean improvisation (Kung and Kung, 2019). Individuals or organizations do not have a plan or time to plan for their situation; they constantly think about the best opportunity (Cunha et al., 1999). In this way, by improvising,

organizations can quickly change their behavior according to changing conditions (Kung and Kung, 2019). Otherwise, as Jack Welch puts it, "When the rate of change inside an institution becomes slower than the rate of change outside, the end is near" (AlNuaimi et al., 2022). Therefore, improvisation against unexpected and unplanned situations emerges as an important capacity of organizations (Limon and Dilekçi, 2020). The study hypothesis formed in this context is as follows;

Hypothesis 1 (H_1): Environmental turbulence has a positive effect on organizational improvisation capability.

Another potential variable that may impact organizational improvisation is organizational culture. Deshpande and Webster (1989) defined organizational culture as shared values and beliefs that help individuals understand the organizational process. Hofstede et al. (2010) defined organizational culture as the shared programming of the mind that distinguishes members of an organization from others. Organizational culture is also defined as a model of basic assumptions that a group discovers or develops while coping with the problems of external adaptation and internal integration (Schein, 1990). Although there is not a clear consensus in the literature on the definition of organizational culture, there is a consensus that organizational culture affects the behavior of employees (Hofstede et al., 2010; Schein, 1990). Each organizational culture has characteristics such as result orientation, risk-taking, innovation, sustainability, and aggressiveness. Therefore, different organizational cultures are likely to affect employees' behaviours and, thus, organizational behavior differently. This study is based on the competitive values model (CVF) developed by Cameron and Quinn (2006). As seen in Figure 1, Cameron and Quinn presented four organizational cultures (adhocracy, clan, market, hierarchy) on two axes, vertical and horizontal. One end of the vertical axis emphasizes more organic processes with flexibility, autonomy, and dynamism, while the other emphasizes more mechanical processes with order, control, and stability. The horizontal axis emphasizes external focus, interaction, and adaptation to the environment, differentiation and competition at one end, and internal focus, integration, and coordination at the other. While external focus refers to the reaction to changes in the environment and a competitive environment, internal focus refers to the harmony in the organization's internal characteristics (Strese et al., 2016; Cameron and Quinn, 2006). Within the scope of this model, organizational culture types will be explained, and the impact of the

interaction of organizational culture types with environmental turbulence on organizational improvisation will be discussed.

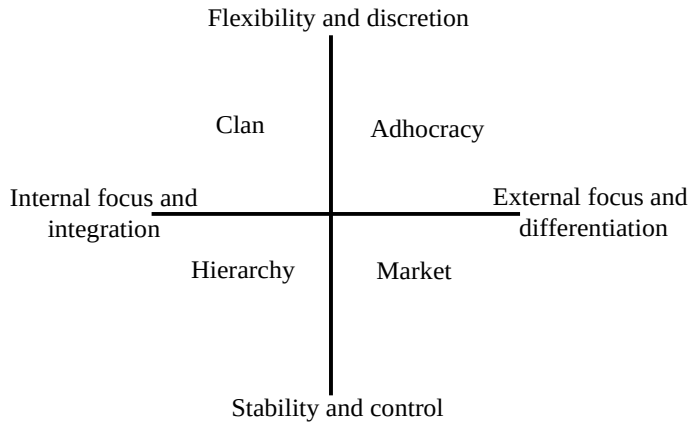

Figure 1: The Competing Values Framework, Adapted from Cameron and Quinn (2006)

Adhocracy is considered the ideal type of organization that emerged with the world's transition from the industrial to the information age. Adhocracy is also a type of organization that can respond rapidly to highly turbulent and ever-accelerating conditions that are highly symbolic of the world of the twenty-first century. The main objective of adhocracy is to encourage adaptability, flexibility, and creativity in situations of uncertainty and high turbulence in the environment. In organizations with an adhocracy culture, external orientation and flexibility are at the forefront. Employees are innovative, and dynamism is emphasized by encouraging employees to take risks. However, this does not mean unnecessary and uninformed risk-taking, ignoring customer needs, covering up mistakes, and lack of coordination. As the adhocracy culture increases, employee involvement in processes and a certain level of tolerance for mistakes increases (Lee and Kim, 2017; Cameron and Quinn, 2006). Such cultures that tolerate mistakes encourage action and view failure as a learning opportunity are said to contribute to organizational improvisation (Du et al., 2019; Cunha and Cunha, 2003; Cunha et al., 1999; Crossan, 1998). The following study hypothesis was developed to examine the moderating role of adhocracy culture in the impact of environmental turbulence on organizational improvisation capability in today's highly turbulent business environment:

Hypothesis 2a (H_{2a}): The effect of environmental turbulence on organizational improvisation is moderated by adhocracy culture, such that this effect is stronger when adhocracy culture is high.

Clan culture is a type of organizational culture with flexibility and internal focus. In organizations with a clan culture, commitment, high cohesion, cooperation, teamwork, consensus, participation in processes, shared values, and collectivism are very important (Kim and Kim, 2015). This provides high flexibility for quickly exchanging creative ideas among organization members (Ogbeibu et al., 2021). In addition, leaders in this organizational culture have mentor and facilitator characteristics. These leaders create an atmosphere where members can take risks and discover new things (Strese et al., 2016). One of the basic assumptions in clan culture is that the environment can be best managed through teamwork by empowering employees. Increasing clan culture means more employee empowerment, involvement in processes, teamwork, communication, and trust in employees. In fast-changing, highly turbulent environments where it is difficult for managers to plan far in advance, one effective way to coordinate organizational activity is to ensure that all employees share the same values, beliefs, and goals. Clan culture provides organizations with this (Cameron and Quinn, 2006). As in jazz music and theatre, improvisation in organizations often takes place in and between groups. Although improvisation is inherently unpredictable, it is a collective action between people and requires collaboration (Vera and Crossan, 2004; Kamoche et al., 2003). Hence, it can be stated that the effect of environmental turbulence on organizational improvisation depends on clan culture. In this context, the following study hypothesis was developed:

Hypothesis 2b (H_{2b}): The effect of environmental turbulence on organizational improvisation is moderated by clan culture, such that this effect is stronger when clan culture is high.

Market culture focuses on alignment with the external environment, where external factors such as suppliers and customers are the primary concern rather than internal issues. Unlike a hierarchical culture where specialized jobs and centralized decisions drive internal control, the market culture operates through competitive dynamics. The dominant core value in this culture is competitiveness. Organizations with a market culture focus on external positioning with an emphasis on competition and quick decision-making. For this reason, they encourage employees to be proactive and competitive and to be aggressively oriented to outperform competitors (Lee

and Kim, 2017; Kim and Kim, 2015; Cameron and Quinn, 2006). Organizations with a market culture consider customer demands, aggressive competition, and rapid response to environmental conditions to improve the organization (Hejazi, 2016). Although market culture reflects a results-oriented organization, strong leadership can motivate employees to make new creative efforts. Ogbeibu et al. (2021) found that market culture increases creativity. The faster the competitive environment among organizations, the faster organizations must respond to changes in the environment (D'Aveni, 1995). This implies that the faster the pace of the environment surrounding the organization, the more likely it is to engage in improvisational activities. Therefore, we believe that a market culture with high competitive dynamics, fast decision-making, and a high emphasis on the external environment will play a role in the impact of environmental turbulence on organizational improvisation. The study hypothesis formed in this context is as follows:

Hypothesis 2c (H_{2c}): The effect of environmental turbulence on organizational improvisation is moderated by market culture, such that this effect is stronger when market culture is high.

Hierarchy culture emphasizes formal rules and procedures for control, stability, and predictability. These rules and procedures determine what employees do and hold the organization together (Cameron and Quinn, 2006). Organizations with a hierarchy culture have a formal and structured work environment. Therefore, it can be stated that there are mechanical processes for stability and control in this culture type. In this culture, instead of adapting to changes in the environment, the aim is to maintain order and the organization's current state by sticking to rules, plans, and procedures (Lee and Kim, 2017; Strese et al., 2016). However, when changes in the environment are significant, strictly following plans and procedures may bring organizational activities to a halt (Wilden and Gudergan, 2015; Akgün et al., 2007). In this context, the following study hypothesis was developed:

Hypothesis 2d (H_{2d}): The effect of environmental turbulence on organizational improvisation is moderated by hierarchy culture, such that this effect is weaker when hierarchy culture is high.

Few studies have addressed the relationship between environmental turbulence and organizational improvisation, and there are differences in the findings of these studies. In addition, this relationship has not been examined in the health sector, and the moderation mechanisms that have the potential to affect this relationship have not been addressed. This study aims to examine

the relationship between environmental turbulence and the organizational improvisation capabilities of hospitals, which are important health system actors in the health sector where change, uncertainty, and dynamism are quite high, and to reveal the effect of various organizational culture types on the relationship between environmental turbulence and organizational improvisation.

1. RESEARCH METHODOLOGY

1.1.Study Design, Participants, and Procedures

This study was designed as descriptive in terms of its purpose and cross-sectional in terms of its time dimension. The study population consists of lower, middle, and upper-level managers working in 172 private hospitals in Istanbul. The managers who will participate in the study must have worked in the hospital for at least three months to comprehend the characteristics of the organizational culture and environment. Since there is no information about this period in the literature, the opinions of academicians who are experts in organizational behavior and organizational theory literature were taken. The three months were determined and based on a rational basis. Within the scope of the study, a disproportionate stratified sampling method was used. The primary purpose of using this sampling method is that hospitals are not homogeneous in terms of human resource quality, number of beds, financial structure, technological competence, and other infrastructure facilities. In addition, we assume that organizational improvisation will differ according to the strata. In this context, hospitals are divided into three strata: A, B, and C.

According to this stratification, in the first strata (A), hospitals with all kinds of medical and technological competence, with a bed number of 100 or more and providing hotel services that can be called luxury; In the second strata (B), there are hospitals with 50-100 beds, which are slightly lower than the first strata, offering services in the form of 3-4 star hotels, with all kinds of medical applications except for specific diagnostic and analysis methods that require excessive technological investment. The third strata (C) includes hospitals with fewer beds and staff volume than the others, offering services in primary branches with limited facilities and mainly catering to the regional low-income group. The hospital classification criteria of the Turkish Ministry of Health were also used in this classification.

The sample size was calculated to represent the population most accurately. In the calculation of the sample size, the assumption of .50, the safest ratio in cases where the proportions of the examined variable are unknown, was used in the study, and the sample size was calculated in the INSTAT 2.0 statistical package program. The estimated ratio of .50 and the estimated half-width of the confidence interval (CI) were assumed to be .7. By adding a 10% margin of error to the obtained number of 410, 451 people were obtained, and this value was taken as the sample size. Based on this sample size, it was planned to reach 150 managers from each stratum. The researchers themselves collected the data through a face-to-face questionnaire method. The study was conducted between December 2021 and January 2022 with the participation of 546 managers from 33 hospitals. In total, 546 managers from 33 hospitals participated in the survey voluntarily.

However, when the questionnaires were examined, 59 were excluded from the evaluation according to the recommendations of Tabachnick and Fidell (2012) due to more than 50% missing data. In addition, three managers (two females and one male) did not agree to participate in the study. As a result, data analysis was carried out with a total of 487 valid questionnaires, 163 from hospitals in group A, 162 from hospitals in group B, and 162 from hospitals in group C. 67% of the participants were female, and about half of them had a bachelor's degree or higher, and 54% of them were middle managers. The participants are 34.9 years old on average (minimum 20 years, maximum 75 years; standard deviation (SD)=8.84), has been working as managers in their hospitals for an average of 4.55 years (minimum one year, maximum 25 years; SD=4.53), and have been working in the health sector for an average of 12.6 years (minimum one year, maximum 55 years; SD=7.98).

1.2.Measures

In this study, three scales consisting of forty-four items were used. All scales are five-point Likert-type, ranging from 1 (Strongly disagree) to 5 (Strongly agree). As the scales' scores increase, environmental turbulence, organizational improvisation capability clan, adhocracy, market, and hierarchy culture increase. In addition, questions such as age and gender were asked to obtain the participant's demographic information, and six questions such as experience and managerial level were asked to learn the working profiles of the participants. The variables of environmental turbulence, organizational improvisation, and organizational culture in the research model are quantitative and are handled in the analyses as follows.

1.2.1. Environmental Turbulence

Wilden and Gudergan (2015) developed the Environmental Turbulence scale and adapted it to Turkish by Kaplan (2020). This scale includes three sub-dimensions, namely "Technological Turbulence," "Market Turbulence," and "Competitor Turbulence," and a total of twelve items.

1.2.2. Organizational Improvisation Capability

The organizational improvisation capability scale was developed by Kung and Kung (2019) and adapted into Turkish by Limon and Dilekçi (2020). This scale initially consists of two sub-dimensions, "Speedy Novel Solution" and "Unplanned Reconfiguration," with eight items. As a result of the validity analysis conducted by Limon and Dilekçi (2020), the scale showed a single-factor structure consisting of eight items.

1.2.3. Organizational Culture

The Organizational Culture scale was developed by Cameron and Quinn (2006) and adapted into Turkish by Akdeniz (2018). In this scale, there are four sub-dimensions and twenty-four items, namely "Clan Culture," "Adhocracy Culture," "Market Culture," and "Hierarchy Culture." These are the items that managers can quickly answer. Since it was stated in previous studies that organizational size would affect organizational improvisation, the hospital group was used as a control variable as an indicator of hospital size (Limon and Dilekçi, 2020; Kamoche et al., 2003).

1.3. Statistical Analyses

Confirmatory factor analysis (CFA) was conducted using the Analysis of Moment Structures (AMOS) 23 program to test the construct validity of the scales. In addition, Cronbach's Alpha coefficient was calculated to test the reliability of the scales. To test study hypotheses, ordinary least squares (OLS) regression was performed using the PROCESS macro (v4.1), developed by Hayes (2022). For a significant effect within the scope of PROCESS macro, 95% CI should not contain zero values. All analyses using the PROCESS macro were conducted with a sample size of 5,000 using the bootstrap technique and 95% CI. In addition, SPSS 23 program was used to consider each study variable's mean scores, standard deviations, and correlation coefficients.

2. ANALYSIS

2.1.Validity and Reliability Analyses Results

As a result of the CFA to test the construct validity of the research model, it is seen that all indices are within the threshold value range ($\chi 2$: 2147.983 degrees of freedom (df)=874; $\chi 2$ /df=2.458; comparative fit index (CFI)=.910; root mean square error of approximation (RMSEA)=.055;

standardized root mean square residual (SRMR)=.047). The loadings of the items within the scales ranged between .503 and .885. However, the eighth item of the environmental turbulence scale was excluded because its loading value was below .30. Exploratory factor analysis (EFA) was also conducted to test the validity of the environmental turbulence scale. Before conducting EFA, Kaiser-Meyer-Olkin (KMO) and Bartlett's test were performed to test the suitability of the data for factor analysis. As a result of the analysis, since the KMO value was .816 and the Bartlett test result was statistically significant, it was determined that the data was suitable for factor analysis (Tabachnick and Fidell, 2012). A three-factor structure explaining 61% of the total variance was obtained. Also, the eighth and fifth items were removed from the scale because they were cross-loading items. In addition, since the first factor explained 35% of the total variance, it was deemed appropriate to evaluate the environmental turbulence scale as a single dimension (Büyüköztürk, 2007). Therefore, the environmental turbulence scale was considered a unidimensional structure consisting of 10 items in testing the hypotheses. Cronbach's Alpha coefficients calculated to test the reliability of the scales are presented in Table 1. Cronbach's Alpha coefficients greater than .70 indicate that the scales are reliable (Hair et al., 2018).

2.2. Hypotheses Testing

Table 1 presents the descriptive statistics of the variables and the correlations between all variables before testing the study hypotheses.

Table 1: Descriptive Statistics and Correlations of the Research Variables

Variables	Mean (SD)	1	2	3	4	5	6
1. Environmental turbulence	4.02 (.55)	**.81**					
2. Organizational improvisation	4.08 (.72)	.438***	**.93**				
3. Adhocracy culture	3.74 (.78)	.374***	.609***	**.90**			
4. Clan culture	3.97 (.79)	.343***	.614***	.754***	**.91**		
5. Market culture	3.90 (.70)	.459***	.600***	.776***	.667***	**.86**	
6. Hierarchy culture	3.92 (.72)	.355***	.595***	.739***	.671***	.740***	**.90**

Notes: n = 487; SD: standard deviation; *** $p < .001$ (two-tailed); Diagonals (in bold) represent Cronbach's alpha coefficient.

Table 2 presents the findings on the effect of environmental turbulence on organizational improvisation. As a result of the analyses, tolerance values greater than .10 and variance inflation factors (VIF) values less than 5 indicate no multicollinearity problem (Keith, 2019).

Table 2: Findings on the Effect of Environmental Turbulence on Organizational Improvisation

Model†	b††	SE	t-value	95% CI
Total Effect Model Outcome: OI				
ET	.583***	.054	10.78	.477, .689
Hospital Group				
Group B	−.067	.072	−.925	−.208, .075
Group C	−.079	.071	−1.107	−.219, .061

Notes: OI: organizational improvisation; ET: environmental turbulence; SE: standard error; *** $p < .001$; †Bootstrap sample size=5,000; ††Unstandardized effects are reported in the table.

Table 2 shows that environmental turbulence has a statistically significant positive effect on organizational improvisation (b=.583; 95% CI = .477 to .689). Therefore, it is determined that as environmental turbulence increases, organizational improvisation also increases. With these results, hypothesis H_1 is accepted.

Tables 3-6 present the findings on the moderating role of organizational culture types on the effect of environmental turbulence on organizational improvisation.

Table 3: Findings on The Moderator Role of Adhocracy Culture in The Impact of Environmental Turbulence on Organizational Improvisation

Model†	b††	SE	t-value	95% CI
Moderation Model (Model 1 of the Hayes' PROCESS) Outcome: OI				
ET	.301***	.050	6.001	.202, .399
AC	.464***	.034	13.50	.397, .532
ET x AC	−.124**	.048	−2.588	−.218, −.030
Hospital Group				
Group B	−.017	.061	−.275	−.136, .102
Group C	−.001	.060	−.015	−.120, .118
Results for conditional effect of ET on OI at different levels of AC				
A Low (-1 SD)	.398***	.057	6.993	.286, .510
A Medium (Mean)	.301***	.050	6.008	.202, .399
A High (+1 SD)	.203**	.068	2.994	.070, .336
R^2			.430	
ΔR^2			.008**	

Notes: OI: organizational improvisation; ET: environmental turbulence; AC: adhocracy culture; SE: standard error; *$p < .05$; **$p < .01$; ***$p < .001$; †Bootstrap sample size=5,000; ††Unstandardized effects are reported in the table.

Table 3 shows that environmental turbulence has a statistically significant positive effect on organizational improvisation (b=.301, 95% CI=.202 to .399). In addition, the effect of adhocracy culture on organizational improvisation is also positive and statistically significant (b=.464; 95% CI=.397 to .532). When the effect of the interaction of environmental turbulence and adhocracy culture (ET x AC) on organizational improvisation is examined, it is seen that this

effect is statistically significant (b=−.124; 95% CI=−.218 to −.030). When the interaction term is included in the model, the variance explained increases statistically significantly (ΔR^2=.008; p<.01). According to these findings, it can be stated that adhocracy culture moderates the effect of environmental turbulence on organizational improvisation.

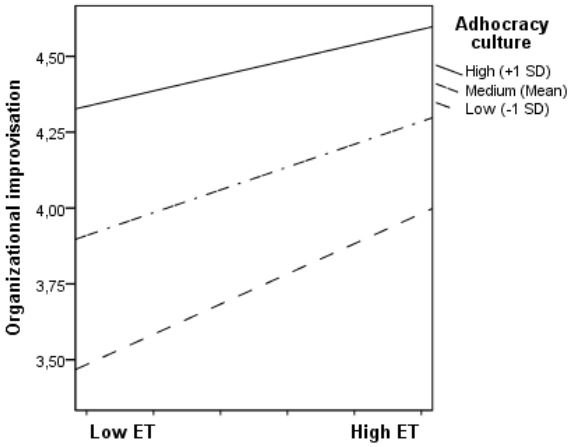

Figure 2: The Effect of Environmental Turbulence On Organizational Improvisation at Different Levels of Adhocracy Culture. ET, environmental turbulence; SD, standard deviation

Figure 2 shows that the effect of environmental turbulence on organizational improvisation varies depending on the adhocracy culture. As indicated in Table 3, the effect of environmental turbulence on organizational improvisation is positive and statistically significant at low, medium, and high levels of adhocracy culture. However, as seen in Figure 2, as the adhocracy culture increases, the effect of environmental turbulence on organizational improvisation weakens. With these results, hypothesis H_{2a} is rejected.

Table 4: Findings on the Moderator Role of Clan Culture in the Impact of Environmental Turbulence on Organizational Improvisation.

Model†	b††	SE	t-value	%95 CI
Moderation Model (Model 1 of the Hayes' PROCESS) Outcome: OI				
ET	.315***	.048	6.498	.219, .410
CC	.469***	.033	14.12	.404, .534
ET x CC	−.142**	.045	−3.150	−.231, −.054
Hospital Group				
Group B	−.101	.060	−1.704	−.218, .016
Group C	−.124*	.059	−2.100	−.239, −.008
Results for conditional effect of ET on OI at different levels of CC				
A Low (-1 SD)	.427***	.054	7.786	.321, .533
A Medium (Mean)	.315***	.048	6.450	.219, .410
A High (+1 SD)	.202**	.066	3.086	.074, .331

R^2	.453
ΔR^2	.011**

Notes: OI: organizational improvisation; ET: environmental turbulence; CC: clan culture; SE: standard error; *p < .05; **p < .01; ***p < .001; †Bootstrap sample size=5,000; ††Unstandardized effects are reported in the table.

Table 4 shows that environmental turbulence has a statistically significant positive effect on organizational improvisation (b=.315; 95% CI=.219 to .410). Moreover, the effect of clan culture on organizational improvisation is also positive and statistically significant (b=.469; 95% CI=.404 to .534). When the effect of the interaction of environmental turbulence and clan culture (ET x CC) on organizational improvisation is examined, it is seen that this effect is statistically significant (b=−.142; 95% CI=−.231 to −.054). When the interaction term is included in the model, the variance explained increases statistically significantly (ΔR^2=.011; p<.01). According to these findings, it can be stated that clan culture moderates the effect of environmental turbulence on organizational improvisation.

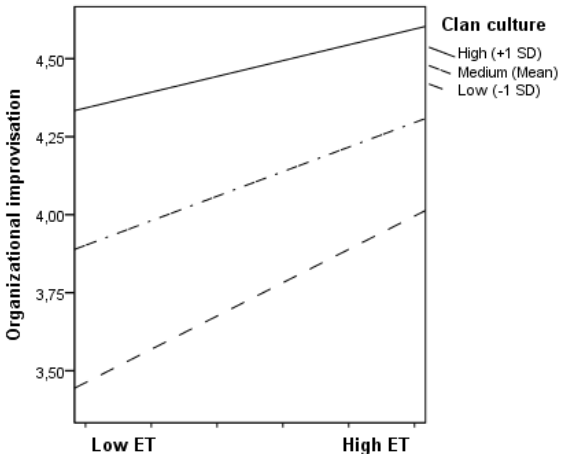

Figure 3. The Effect of Environmental Turbulence on Organizational Improvisation at Different Levels of Clan Culture. ET, environmental turbulence; SD, standard deviation

Figure 3 shows that the effect of environmental turbulence on organizational improvisation varies depending on clan culture. As seen in Table 4, the effect of environmental turbulence on organizational improvisation is positive and statistically significant at all levels of clan culture. However, as the clan culture increases, the effect of environmental turbulence on organizational improvisation weakens. With these results, hypothesis H_{2b} is rejected.

Table 5. Findings on the Moderator Role of Market Culture in the Impact of Environmental Turbulence on Organizational Improvisation

Model[†]	b[††]	SE	t-value	95% CI
Moderation Model (Model 1 of the Hayes' PROCESS) Outcome: OI				
ET	.241***	.054	4.445	.135, .348
MC	.518***	.042	12.43	.436, .599
ET x MC	−.122*	.053	−2.329	−.226, −.019
Hospital Group				
Group B	.024	.063	.378	−.099, .147
Group C	.024	.062	.389	−.098, .147
Results for conditional effect of ET on OI at different levels of MC				
A Low (-1 SD)	.327***	.058	5.621	.213, .441
A Medium (Mean)	.241***	.054	4.445	.135, .348
A High (+1 SD)	.156**	.072	2.165	.014, .298
R^2			.400	
ΔR^2			.007*	

Notes: OI: organizational improvisation; ET: environmental turbulence; MC: market culture; SE: standard error; *p < .05; **p < .01; ***p < .001; [†]Bootstrap sample size=5,000; [††]Unstandardized effects are reported in the table.

Table 5 shows that environmental turbulence has a statistically significant positive effect on organizational improvisation (b=.241; 95% CI=.135 to .348). Moreover, the effect of market culture on organizational improvisation is also positive and statistically significant (b=.518; 95% CI=.436 to .599). When the effect of the interaction of environmental turbulence and market culture (ET x MC) on organizational improvisation is examined, it is seen that this effect is statistically significant (b=−.122; 95% CI=−.226 to −.019). When the interaction term is included in the model, the variance explained increases statistically significantly (ΔR^2=.007; p<.05). According to these findings, it can be stated that market culture moderates the effect of environmental turbulence on organizational improvisation.

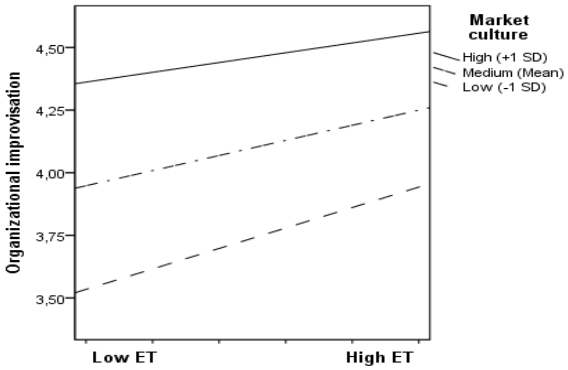

Figure 4: The Effect of Environmental Turbulence on Organizational Improvisation at Different Levels of Market Culture. ET, environmental turbulence; SD, standard deviation

Figure 4 shows that the effect of environmental turbulence on organizational improvisation varies depending on the market culture. As seen in Table 5, environmental turbulence has a statistically significant positive effect on organizational improvisation at all levels of market culture. However, as market culture increases, the effect of environmental turbulence on organizational improvisation weakens. With these results, hypothesis H_{2c} is rejected.

Table 6: Findings on the Moderator Role of Hierarchy Culture in the Impact of Environmental Turbulence on Organizational Improvisation

Model†	Effect††	SE	t-value	95% CI
Moderation Model (Model 1 of the Hayes' PROCESS) Outcome: OI				
ET	.339***	.050	6.771	.241, .437
HC	.500***	.038	13.13	.425, .575
ET x HC	−.042	.051	−.837	−.142, .057
Hospital Group				
Group B	−.019	.062	−.303	−.139, .102
Group C	−.062	.061	−1.016	−.182, .058
R^2			.415	
ΔR^2			.001	

Notes: OI: organizational improvisation; ET: environmental turbulence; HC: hierarchy culture; ***p < .001; †Bootstrap sample size=5,000; ††Unstandardized effects are reported in the table.

Table 6 shows that environmental turbulence has a statistically significant positive effect on organizational improvisation (b=.339; 95% CI=.241 to .437). Moreover, the effect of hierarchy culture on organizational improvisation is also positive and statistically significant (b=.500; 95% CI=.425 to .575). When the effect of environmental turbulence and hierarchy culture interaction (ET x HC) on organizational improvisation is examined, it is seen that this effect is not statistically significant (b=−.042; 95% CI=−.142 to .057). According to these findings, it can be stated that hierarchy culture does not have a moderator role in the effect of environmental turbulence on organizational improvisation. With these results, hypothesis H_{2d} is rejected.

3. DISCUSSION

In this study, the effect of environmental turbulence on the organizational improvisation capability of hospitals in the health sector is examined, where environmental uncertainty and dynamism are quite high and under the influence of legal restrictions. It was determined that the turbulence in the environment of private hospitals positively affects the organizational improvisation capability of hospitals. When the literature is examined, it is seen that organizational improvisation still needs to be sufficiently examined and is still in the development phase. Some studies address the

relationship between environmental turbulence and improvisation conceptually and empirically in various sectors. However, when the results of these studies are considered, it is seen that different results are presented, discussions continue, and the number of studies is limited. For example, the study conducted by Moorman and Miner (1998) in the electronics and food sector is similar to our study findings and supports our results. In the conceptual study of Cunha and Cunha (2003), it is emphasized that there will be a curvilinear relationship between environmental turbulence and organizational improvisation. Accordingly, it is stated that organizational improvisation will be low when environmental turbulence is low and high, and organizational improvisation will be high when environmental turbulence is moderate. However, our study found a linear relationship between environmental turbulence and organizational improvisation capability and that organizational improvisation increases as environmental turbulence increases. The study conducted by Pavlou and El Sawy (2010) with 507 participants working in the new product development unit also supports our study findings. In a study conducted by Akgün et al. (2007) with the participation of 197 product or project managers in high technology sectors, no relationship was found between environmental turbulence and team improvisation.

As seen in Tables 3-5, adhocracy, market, and clan cultures moderate the relationship between environmental turbulence and organizational improvisation. On the other hand, it was determined that hierarchy culture did not have a moderator role in this relationship (Table 6). When the literature is examined, it is assumed that as the level of adhocracy, clan, and market culture increases, the positive effect of environmental turbulence on organizational improvisation will strengthen (Hejazi, 2016; Cameron and Quinn, 2006; Cunha and Cunha, 2003; Kamoche et al., 2003). However, according to the findings, as the level of these three organizational cultures increased, the positive effect of environmental turbulence on organizational improvisation weakened. The research data were collected between December 2021 and January 2022, when the coronavirus disease 2019 (COVID-19) pandemic was intense in Turkey, and the number of daily cases was 35,000 on average. Therefore, the turbulence in the environment of hospitals (M=4.02) and the organizational improvisation capability of hospitals (M=4.08) are quite high. Although there is a positive effect of environmental turbulence on organizational improvisation at low, medium, and high levels of adhocracy, clan, and market culture, contrary to what was assumed, this positive effect weakens as the levels of adhocracy, clan, and market culture increase, and this may be due to the characteristics of health services.

Health services differ from services in other sectors due to its characteristics. One of the most fundamental characteristics is that error cannot be accepted because its output is human health (Teleş, 2022). In addition, due to legal obligations, situations such as improvisation are likely to bring some legal problems. Therefore, even if the three organizational culture levels increase in health service delivery, the effect of environmental turbulence on organizational improvisation cannot be strengthened. Because it is not possible to improvise everything in health service delivery literally, but it is necessary to adhere to specific procedures and standards. Otherwise, malpractice may occur, human health may be at risk, and the organization and healthcare professionals may face negative situations such as lawsuits (Morgan et al., 2016; Brinkerhoff 2004). Therefore, it is thought that this situation limits the strengthening of the effect of environmental turbulence on organizational improvisation, despite the increase in three organizational culture levels.

This study has several theoretical implications. First, the study contributes to the development of the organizational improvisation literature, especially the management literature, by addressing the relationship between environmental turbulence and organizational improvisation, in which the results are not similar, and discussions continue (Pavlou and ElSawy, 2010; Akgün et al., 2007; Cunha and Cunha, 2003; Moorman and Miner, 1998). Secondly, the inclusion of the organizational culture variable in the model, which has the potential to affect this relationship, provides a different perspective by clarifying and better understanding this relationship and shows that organizational culture affects this relationship. In addition, conducting this study in the health sector, which is a sample with different characteristics from the sectors previously studied, and due to the characteristics specific to health services, enriches the organizational improvisation literature by revealing a different understanding from the results obtained so far.

This study has some limitations, and the research findings should be interpreted in light of these limitations. First, due to the study's cross-sectional design, each variable was measured simultaneously, with no temporal precedence. Therefore, causal inferences from the findings of this research should be made carefully. Secondly, the study data were collected from private hospitals in Istanbul during the COVID-19 period. Therefore, this may limit the generalizability of research findings to periods other than the COVID-19 pandemic. Third, although only three individuals declined to participate in the study, the volunteer/self-selection bias may have affected

the results. Despite the limitations of the study, the sampling method is its strength. The use of a stratified sampling method increases external validity and generalizability. The study findings will likely differ in public hospitals and other sectors. In future studies, comparisons between public and private sectors in multiple centers and comparisons between different sectors will contribute to clarifying the relationship between environmental turbulence and organizational improvisation.

4. CONCLUSIONS

In summary, this study indicates that environmental turbulence is an influential factor in the organizational improvisation capability of private hospitals. The moderation analysis findings revealed that organizational culture types are important mechanisms for clarifying the relationship between environmental turbulence and the organizational improvisation capability of private hospitals. Situations where high uncertainty and dynamism, such as the COVID-19 pandemic, cause hospitals to make more improvised decisions. Therefore, it is thought that knowing that the organizational culture affects this decision process will benefit health managers in making healthier decisions.

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