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THE MEDIATING ROLE OF JOB SATISFACTION BETWEEN ORGANIZATIONAL AGILITY AND INNOVATION: A RESEARCH ON NURSING MANAGERS

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Purpose: The aim of the article is to draw the relationship between organizational agility and the innovation process in healthcare organizations and to examine the mediating role of job satisfaction in this relationship.
Methodology: The quantitative study was conducted on a research sample determined using the convenience sampling method, consisting of 470 nurses managers working in healthcare organizations in Turkey. For statistical analysis of the data, we used the PLS-SEM approach to analyse the data, testing the hypotheses of current study.
Findings: Nursing managers play an important role in the mechanism of shaping an innovative work environment based on organizational agility. Organizational agility contributes to innovation in healthcare organizations. Job satisfaction is one of the factors influencing this relationship, therefore organizations should strive to increase it.
Research limitations: The survey was limited to health care nursing managers in Turkey. Although the number of responses is high (n = 470), limiting the sample to a specific geographical region may hinder generalisations. Therefore, future research could include nurse managers from other countries.
Practical implications: The empirical results of the current study confirm the research model developed. The results provide guidance for healthcare managers. Through to this study, attention has been drawn to the need to develop all determinants of organizational agility and employee satisfaction in order to foster innovation in healthcare organizations.
Originality/value: Nursing managers should develop the competences and knowledge necessary for organizational agility. Proper formulation of challenges and tasks (for managers and for nurses' teams), in line with Expectation States Theory (EST), will increase job satisfaction and have a positive impact on the innovation process.
Keywords: organizational agility, innovation, job satisfaction, healthcare organization.
Category of the paper: research paper.

1. Introduction

Healthcare institutions and their employees play a key role in addressing health needs. In addition, these organizations must provide high-quality services that are accessible to patients who need them, while being competitive at efficient the same time. Managing this organization is particularly difficult, because achieving the organization's goals economically and efficiently should simultaneously meet the changing needs of patients.

Therefore, one of the desirable features of modern healthcare organizations is organizational agility and the implementation of innovations. Organizational agility is a necessary skill that enables companies to quickly react to changes in the operating environment that appear on the market (Akkaya, 2021). Organizational agility makes it easier for organizations to respond to environmental changes (Tamtam, Tourabi, 2020) and, at the same time, may constitute a potential for innovative processes and activities. The implementation of innovative solutions is becoming an inevitable trend in improving the quality of services provided and improving medical productivity (Lv et al., 2021). As a result of innovations in the nursing field work of nurses, it is currently possible to improve efficiency and introduce new solutions. The source of innovative processes in healthcare organization is primarily employees (Shin et al., 2017; Yan et al., 2020). Nurses that provide up to 80% of primary health care (Hughes, 2006) and their managers are a special group of people whose behavior and abilities can influence the creation and implementation of innovations. The research conducted so far highlights the role of innovative behaviors of nurses (McSherry, Douglas, 2011; Zhu et al., 2014) in the innovation process. Moreover, they emphasize the essence of an innovation-friendly organizational climate, thanks to which employees are willing to transform their creative ideas into innovative products (Emiralioğlu, Sönmez, 2021). Job satisfaction is of particular importance in motivating nurses and their managers to undertake innovative activities. Knowledge, experience, and teamwork of healthcare professionals are catalysts to develop the necessary innovative solutions for many global health problems, while also serving as a source of job satisfaction in the healthcare industry.

Expectation States Theory (EST) is not only considered one of the interactive theories relating to cooperative activities and job satisfaction in social groups, but also used as a framework to develop an understanding the relationship between organizational agility and the innovation process in healthcare organizations (Wagner, 2007; Roth et al., 2012). The main assumption of this theory is that employees are in a task relationship with each other, and based on the available information, their expectations are formulated about the actions of others in relation to specific tasks (Berger et al., 1977). Therefore, in line with the EST, the join activities of nurses and their managers, especially regarding organizational agility in responding to change, as well as in the implementation of future innovative tasks, perfectly fits into the dynamics of such relationships.

Due to the enormous benefits of innovation in many organizations, research is also being undertaken in the healthcare sector (Żukowicka-Surma, Fritzsche, 2023; Glover et al., 2020). Contemporary research identifies factors for the development of organizational agility in healthcare organizations (Prashar, 2024; Akkaya, Mert, 2022), and ways of adapting to change (Zeid et al., 2024). However, there is a lack of research that assesses the relationship between organizational agility and the innovation process in healthcare organizations. Therefore, the current study aims to investigate the relationship between organizational agility and the innovation process in healthcare organizations and the mediating role of job satisfaction in this relationship.

Organizational agility and innovation process

Organizational agility is defined as the company's ability to react quickly to both expected and unexpected changes occurring in its internal and external business environment (Akkaya, 2021). The organizational agility model for business developed by Sharifi, Zhang (2001) has four main elements: i) responsiveness, ii) flexibility, iii) quickness, and iv) competency. These are used to determine whether the company is organizationally agile or not.

The involvement to continuous transformation and agile strategies causes changes at many levels of the organization, from its structure, through leadership to the skills and interpersonal relationships of co-workers carrying out an agile mission (Appelbaum et al., 2017, Gardner et al., 2023). This allows organizational agility to provide the framework necessary for the innovation process. Putting agility in the foreground of innovation supports not only the ability to respond quickly and flexibly to changes in the business environment, but also the ability to proactively generate change, whether technology or customer driven (Brand et al., 2021). Research conducted in other industries indicates that organizational agility increases the efficiency of radical innovations both in a specific situation and in an environment with technological turbulence (Puriwat, Hoonsopon, 2021). Therefore, we hypothesized that

H1: *There is a positive relationship between nursing managers' perceptions of organizational agility and innovation process*.

Organizational agility and job satisfaction

Organizational agility is necessary in healthcare settings due to the complexity and interdependence of their systems, which include many services and relationships (Motwani, Katatria, 2024). Agility suggests to managing an organization creates the conditions necessary to create innovation. These include openness to new ideas, technologies and solutions resulting from the market needs or the interests of the organization. The innovative climate has a positive impact on job satisfaction (Demircioglu, 2021). The motivators of job satisfaction include relations with colleagues and leaders (Alrawahi et al., 2020; Yu et al., 2018), and the nurse's work environment (Kagan et al., 2021). Formulating by managers and nurse’s expectations

regarding actions to improve the implementation of various processes based on new information will increase job satisfaction. Therefore, we hypothesized that

H2: *There is a positive relationship between organizational agility and job satisfaction of managers of nurses in healthcare institutions*.

Job satisfaction and innovation process

Studies to date shows that job satisfaction is a key indicator of well-being and mental health in the workplace (Hünefeld et al., 2019). Satisfaction with work affects commitment, achieving better results and creativity (Demircioglu, 2021). Moreover, job satisfaction positively influences individual innovative behavior of employees (Niu, 2014; Xerri, 2014). Due to the fact that the innovative climate stimulates initiative behavior (Kagan et al., 2021) and encourages to be active, promotes innovation, we hypothesized

H3: *There is a positive relationship between job satisfaction of nurse's managers and innovation process in healthcare institutions.*

Job satisfaction, organizational agility and innovation process in healthcare institutions

The literature emphasizes that nurses are of fundamental importance for high-quality in healthcare (Jackson, Kozlowska, 2018), as well as for the implementation of new innovative solutions and practices (Hughes, 2006; Mcsherry, Douglas, 2011). Nursing managers, on the other hand, are the frontline leaders who manage wards and influence the staff's ability to deliver quality care (Trus et al., 2012; Alharbi et al., 2021). Research emphasizes the role of employees in creating innovation (Weng et al., 2013), because it turns out that the most innovation is created inside the organization thanks to employees. That is why it is so important to learn about the factors supporting employees in being innovative. Work satisfaction is the determination of creativity (Wang et al., 2021) and openness to change (Satuf et al., 2018). Moreover, job satisfaction in relation to immediate superiors and relations in the workplace influence employees' involvement in innovation (Tsai, Yen, 2020). Formulating specific expectations regarding tasks by nursing managers, depending on the changing conditions of functioning, increases, in accordance with EST, job satisfaction. Furthermore, the basis for a safe and stable work environment can be organizational agility (Walter, 2021). Accordingly, we hypothesized

H4: *Job satisfaction of nursing managers has mediating role between organizational agility and innovation process in healthcare institutions*.

The hypothesis model is presented in Figure 1.

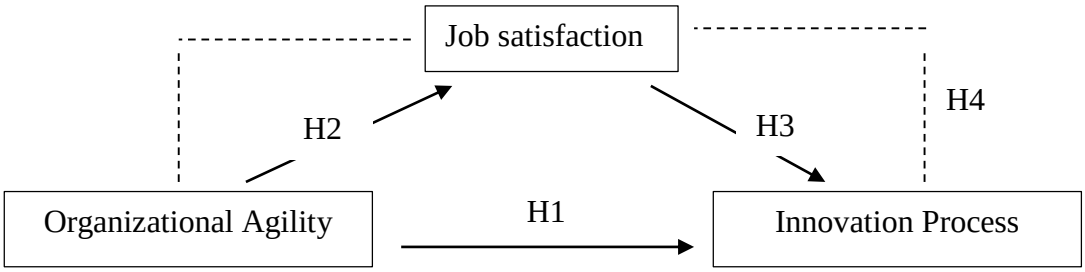


Figure 1. Research Model.

Source: own elaboration.

2. Materials and Methods

The present study used a quantitative approach to test the recommended hypotheses. A convenience sampling technique was used to collect data (Etikan et al., 2016). The survey was conducted among nurses working in a city located in the west of Turkey. To obtain the largest possible sample size, probabilities of 0.5 were used. Achieving a 95% confidence level (with $\alpha = 0.05$), it is acceptable for the frequency of the examined event (p) to fall 5% below or exceed the actual population rate (P), implying a sampling error of d = 0.05 amidst around 3849 studies (www.manisa.gov.tr). The size of the universe is 3849, and as a result, the sample calculation was computed using the formula provided.

$$n = \frac{\mathrm{N}t^2\mathrm{pq}}{d^2\,(\mathrm{N}-1) + t^2\mathrm{pq}} \tag{1}$$

where:

N - Number of individuals in the target audience = 3849,

n - Number of individuals to be sampled,

p - Frequency of occurrence of the event examined (probability of occurrence) = 0.5,

q - Frequency of occurrence of the examined event (probability of not occurring) = 0.5,

t - At a certain level of significance, the theoretical value found according to the t table = 1.96,

d - It is the ± sampling error accepted according to the frequency of occurrence of the event. = 0.05.

According to the prescribed formula (1), the minimum sample size required was found to be 307 individuals. 505 participants were recruited for the study and surveys with incomplete responses were omitted from the analysis. Therefore, 470 sets of data were utilized in the research.

470 nursing managers in Turkish healthcare organizations have participated voluntarily in the current study. The sample size is appropriate, consisting over 300 respondents (Comrey, Lee, 2013). The profile of respondents consists of 30.0% males and 70.0% females. Relating to work experience, 64.3% worked less than ten years, and 37.7% worked more than ten years. About the healthcare organization, most organizations (85.6%) were public, while 14.4% were private. Regarding employee number, 24.7% were from the healthcare organization having 100 and less employees, 75.3% were from the healthcare organization having more than 100 employees.

The questionnaire consisted of two parts. The first part was about demographic information of nursing managers. The second part of the questionnaire contained constructs to examine the variables in the study: organizational agility, innovation processes and job satisfaction. The first section in this part of survey was about nursing managers' perceptions of organizational agility. Organizational Agility (OA) scale was developed by Sharifi and Zhang (1999) and adapted to Turkish by Akkaya and Tabak (2018). It presents 17 items. The second section is about Innovation Process (IP) developed by Wang and Ahmed (2004) and has 4 items. The last section was Job Satisfaction (JS) developed by Judge et al. (1998) and adapted to Turkish by Başol and Çömlekçi (2020). It has 5 items. A standardized five-point Likert scale was used to organize the scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree).

Demographics, descriptive statistics, and the test of normality were determined using SPSS. For confirmatory factor analysis, internal accuracy and validity estimations, hypothesis verification, and mediation testing, Smart PLS version 3.0 was applied. We used the PLS-SEM approach to analyze our hypotheses based on several parameters. According to Fornell and Larcker (1981), PLS avoids many of the limiting assumptions that drive maximum likelihood techniques while still protecting against imprecise solutions and factor indeterminacy. PLS-SEM does not imply any distributional assumptions on the inDISators or error terms (Hair et al., 2014) and PLS can address both reflecting and formative constructs (Hair et al., 2006). PLS is a latent variable modeling technique that involves a large number of dependent variables and specifically detects measurement error. Furthermore, unlike covariance-based SEM approaches, PLS is unaffected by sample size limits and may be used with any sample size higher than thirty (Fornell, Larcker, 1981). Thus, SmartPLS was used for the examination of causal relationship among variables.

3. Results

First, we used correlation analysis to determine the link between variables in the study. The outcome indicated that there is a strong connection between variables as presented on Table 1.

Table 1.
Validity, Correlations and Descriptive Statistics

Variables	C	F	IP	JS	Q	R
C	0.750					
F	0.571	0.722				
IP	0.586	0.449	0.797			
JS	0.644	0.467	0.669	0.785		
Q	0.450	0.585	0.354	0.390	0.767	
R	0.663	0.582	0.399	0.454	0.526	0.863
CR	0.910	0.760	0.874	0.889	0.810	0.897
AVE	0.662	0.621	0.635	0.616	0.688	0.744
A	0.887	0.721	0.807	0.844	0.767	0.830

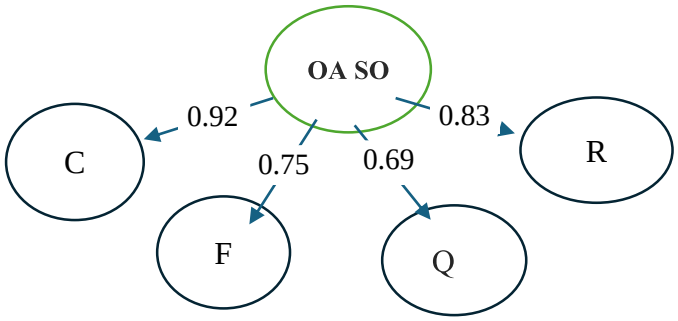
Note: C – Competency, F – Flexibility, Q – Quickness, R – Response, IP– Innovation process, JS – Job satisfaction; CR = Composite Reliability; AVE = Average Variance Extracted; α = Cronbach's Alpha.

Source: own elaboration.

To test reliability, the composite scale reliability (CR), Cronbach alpha, and average variance extracted (AVE) were applied. PLS-based CR exceeds the value of 0.70 for all first order constructs, Cronbach alpha exceeds the value of 0.70, and AVE is above the value of 0.50. Furthermore, we investigated convergent validity by examining the standardized loadings of the measures on their respective constructs, and we observed that all exceeded 0.60 (Fornell, Larcker, 1981).

Moreover, as a second order variable, OA was estimated through a secondary factor analysis yielding four latent constructs: Competency, Flexibility, Quickness and Response. Figure 2 shows the standardized regression loadings of those constructs.

T-statistics were calculated for all coefficients based on their consistency across sub-samples in order to identify statistically significant relationships and the path coefficients associated with t-values showed the direction and impact of each hypothesized relationship. For assessing the indirect impacts of factors, the Preacher and Hayes (2008) technique was used. The mediation process works as follows: Y is a variable impacting as a mediator if X affects Y, X affects Z, and Y significantly influences Z while controlling for X, and the effects of X on Z decrease considerably when Y is added in the model concurrently with X as an interpretation of Z (Preacher, Hayes, 2008).



	Path Coefficient (β)	*p Value*
OA SO -> C	0.92	0.000
OA SO -> F	0.75	0.000
OA SO -> Q	0.69	0.000
OA SO -> R	0.83	0.000

Note: C = Competency; F = Flexibility; Q = Quickness; R = Response, OA SO - Organizational Agility Second Order.

Figure 2. Second Order Factor Analysis of Organizational Agility.

Source: own elaboration.

Table 2 displays the hypotheses' outcomes, including pathways, betas, and significance levels. In terms of the direct impacts of JS, the results showed that JS was significantly and positively associated with IP ($\beta = 0.50$; $p < 0.01$). Thus, H1 is supported. The findings, on the other hand, provide empirical evidence in favor of a direct link between OA and IP. Therefore, H2 is also supported ($\beta = 0.26$; $p < 0.01$). Furthermore, the results showed that OA was significantly and positively associated with JS ($\beta = 0.63$; $p < 0.01$), Hence, H3 is supported, too.

Moreover, we also performed mediation analysis to assess the mediating role of JS on the relationship between OA and IP. With the inclusion of mediating variable JS, the impact of OA on IP ($\beta = 0.58$; $p < 0.01$) become significant. However, the indirect effect of OA on IP decreased ($\beta = 0.32$; $p < 0.01$) but was still significant. These findings indicate that the relationships between OA and IP is partially mediated by JS, supporting H4 (Table 2).

Table 2.
Results of Hypothesis

Relationships			**Path Coefficient (β)**	**Sample Mean (M)**	**Standard Deviation (STDEV)**	**T Statistics (|O/STDEV|)**	**Hypotheses**	**Results**
JS	→	IP	0.503*	0.505	0.051	9.827	H1	Supported
OA SO	→	IP	0.263*	0.263	0.048	5.542	H2	Supported
OA SO	→	JS	0.632*	0.636	0.035	18.060	H3	Supported
Total effect								
OA SO	→	IP	0.581*					
Direct Effect								
OA SO	→	IP	0.263*					
Indirect Effect								
OA SO	→	JS→IP	0.318*					

Note: IP – Innovation process, JS – Job satisfaction, OA SO – Organizational Agility Second Order, *p < 0.01

Source: own elaboration.

To validate the PLS-SEM approach, several quality scores such as the coefficient of determination (R^2), Q predictive validity (Q2), and SRMR (standardized root mean squared residual) are applied. Innovation process (R^2 = 0.49) and job satisfaction (R^2 = 0.40), both having significant impact. The Q preDIStive validity of all of our endogenous notions was similarly acceptable. This finding implies that the preDIStors of the models may explain the variation in the dependent variable. Moreover, SRMR should be equal to or less than 0.08 (Hu, Bentler, 1998), and Table 3 and Figure 3 indicate that SRME for our model is 0.053, which meets this criterion.

Table 3.
Structural Model

Endogenous Constructs	R Square	SSO	SSE	Q² (=1-SSE/SSO)	SRMR
IP	0.399	1876.000	1308.723	0.302	0.053
JS	0.490	2345.000	1776.486	0.242	

Note: IP = Innovation Process; JS = Job Satisfaction.

Source: own elaboration.

In the same time the structure model, confirm the values included in the Table 3.

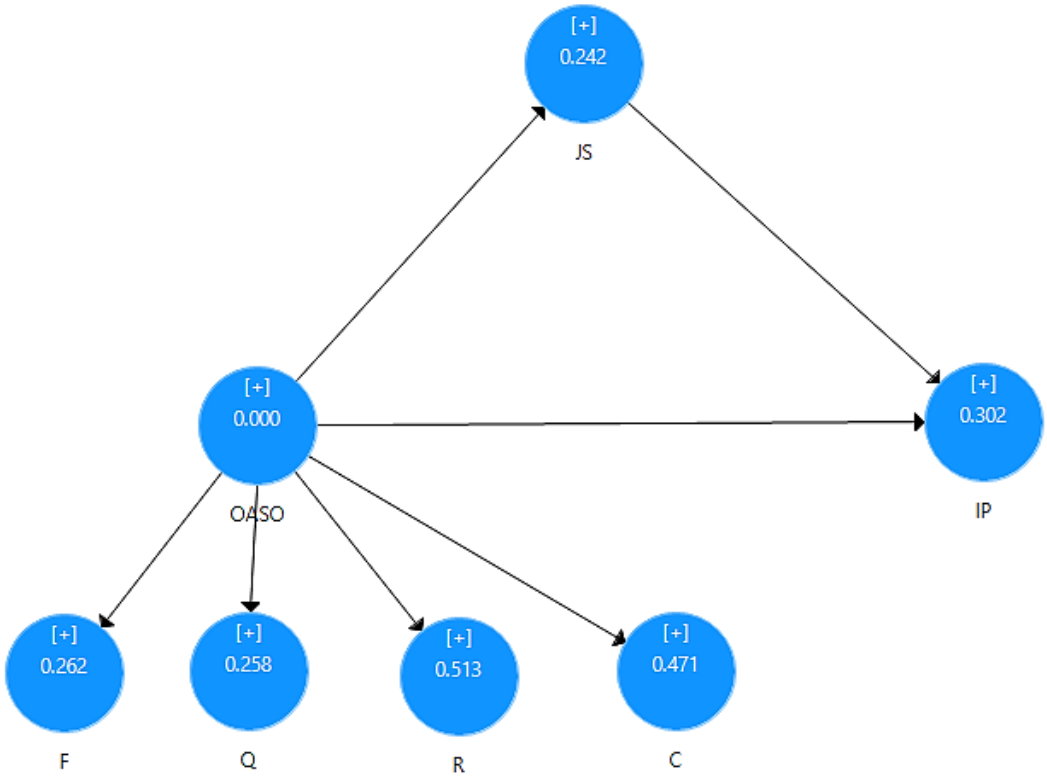


Figure 3. Structure Model.

Source: own elaboration.

4. Discussion and Conclusion

Managers can increase firms' performance by satisfying their employee and nurses (Everhart et al., 2013). Customers, patients, and guests are increasingly worried about the quality of their healthcare. To fulfil this need, the healthcare organizations should work to enhance their current product or service by incorporating innovation into their processes, organizational agility being the solution for this.

Healthcare organizations have been a major issue all over the world since a healthy community influences national growth, especially since Covid-19 pandemic. The lack of qualified personnel in healthcare, especially nurses, is a problem facing the entire world, and with the onset of the health crisis induced by coronavirus, this concern has increased. For this, nursing managers play a vital role, significantly influencing job satisfaction achievement and decreased concern (Tang, Hudson, 2019). Organizational agility is vital in enhancing procedures in relation to infrastructure and management needs in response to the complex demands of the healthcare industry within the global business environment (Akkaya, Mert, 2022). In addition, the healthcare sector is facing increasing competition, technological innovation, changing market environment and customer requirements (Tseng, Lin, 2011), organizational agility is becoming more important, supporting coordination and collaboration, so that the result reflects an improvement regarding the patients' experience (Vaishnavi et al., 2019).

The results of the current study are significant, being consolidated by previous studies in the literature in the field. The findings of the study indicate that organizational agility has an impact on innovation process in healthcare organizations. Data plays a vital part in enhancing organizational agility, by improving the flexibility and enhancing detail in healthcare systems, aiding in developing algorithms, facilitating the creation of self-organizing work units, establishing appropriate communication links, strengthening decision-making systems and instilling confidence in employees (Vaishnavi et al., 2019). Jones and Smith conducted a study investigating the impact of organizational agility on the innovation process within healthcare organizations (Jones, Smith, 2017). Research indicates that organizational agility is a crucial factor in enhancing innovation within the healthcare sector. Similar results were found by Alhassani and Al-Somali (2022), and Melián-Alzola et al. (2020). To achieve service innovation one of the required competencies is represented by organizational agility and is implemented in healthcare in order to provide both service innovation (Melián-Alzola et al., 2020), leading to hospitals performance (Akenroye, Kuenne, 2015).

We reported a positive relationship between organizational agility and job satisfaction of nursing managers. Melián-Alzola et al. (2020) have studied how hospital managers affect employee outcomes, the results highlighting that the hospital agility and performance significantly influence the personnel satisfaction (Melián-Alzola et al. (2020). In order to assure

improvement on patients' status, the healthcare service must be prompt (Drupsteen et al., 2016), being associated to organizational agility. The agility can be associated with lean, improving the services quality, and satisfaction (Gardner et al., 2023; Drupsteen et al., 2016; Rahimnia, Moghadasian, 2010).

The positive relationship between job satisfaction of nurse managers and innovation process was confirmed by the current study. Brimhall and Mor Barak (2018) highlighted also a positive relationship between innovation and job satisfaction (Brimhall, Mor Barak, 2018). Innovation in healthcare is vital to improve quality of care (Demircioglu, 2021), developing organizational field of healthcare (Page, 2014), digital era and technology give opportunity to healthcare organizations to be more dynamic and adaptive (Üstgörül, Akkaya, 2023), increasing employee job satisfaction (Brimhall, Mor Barak, 2018).

Job satisfaction of nursing managers mediates the relationship between organizational agility and innovation process in healthcare institutions and the results confirmed it.

This enables a more profound comprehension of the leaders' role and influence in the healthcare sector. Therefore, the nursing managers' job satisfaction significantly influences work dynamics throughout healthcare organizations. Nursing managers hold a crucial position in healthcare institutions, being accountable for managing and coordinating business processes as well as directing innovative practices. The correlation between job satisfaction and the innovation process can have an impact on the satisfaction and motivation of nurses, reinforcing the culture of innovation in healthcare establishments. Nursing managers' job satisfaction can additionally influence the organization's agility, encompassing the capacity to promptly and effectively adapt to changing conditions. Job satisfaction among managers can enhance agility in organizations, enabling smoother adaptation to innovative processes (Dekoulou, Trivellas, 2015). To our knowledge, there are no studies in extant literature, that confirm or rebut this relationship, the novelty of our paper being based on this. Thus, this current research is critically important for future researches. However, taking into account the confirmation of the relationships reflected by hypotheses above, we are predisposed to consider that the results are relevant. We restricted our focus to defining organizational agility in terms of the capacity of health care organizations to respond customers, patients and guests' expectations when they need to. This is closely related to management process and decision making (Teece et al., 2016; Zhen et al., 2021; Üstgörül, Popescu, 2023). Therefore, we collected data from nursing managers who are critically important for health care organizations to adapt environment and changes. The empirical results of current study strongly support the research model and the findings provide specific actionable guidance for health care managers on how to increase their innovation process through organization agility.

Further research is required to show what specifically nursing managers in Turkey need, where are prominent at management level and what positions are critical for decision making in the innovation process. Concrete and empirical findings are necessary in decision making to

devise appropriate strategies for successful management to ensure nurses are full participants during Covid-19 pandemic.

This research was limited to the nursing managers in healthcare in Turkey. Although the number of responses is high (n = 470), all participants were either living in west of Turkey. Moreover, the limitation of a certain geographical region's sample may impede generalisations. The presence of predominantly local participants could be inadequate in depicting the distinct dynamics and cultural distinctions within healthcare institutions in other parts of Turkey. Secondly, the data was solely collected from nurses. This could lead to a shortfall in conveying the views and insights of other healthcare professionals and managers. Specifically, there may be variations in organisational flexibility and the innovation procedure across diverse professional sectors. Additionally, the employment of surveys as the study's data collection method might limit a comprehensive representation of participants' actual emotional states. While surveys can measure emotional and experiential components, they may overlook nuanced details and result in incomplete representation of participants' genuine emotional experiences. Additionally, it should be noted that this research was constrained by time limitations, as the study was conducted over a specific timeframe and may therefore not fully reflect the fluctuations within the variables and dynamics of the health sector over time. The use of quantitative research design method limits the interpretation of our findings. Thus, future research would be a mixed method study — combination of qualitative and quantitative methods — to study the perception of innovation and its effects on nurses in health care organizations. These limitations should be considered when interpreting the findings of the investigation and drawing broader conclusions.

The results are of high importance for healthcare managers because it raises awareness to the importance of agility in hospitals. This study presents an innovative research approach by exploring a perspective that has yet to be investigated in the healthcare sector. By undertaking this analysis, this study aims to address a significant research gap in the field. It aims to examine the correlation between job satisfaction among nurses working in health institutions and the agility and innovation process in organisations. The paucity of studies in the health sector literature examining these variables, taken with each other, demonstrates that this research fills a crucial gap in the field and makes a one-of-a-kind contribution. Furthermore, the study aimed to investigate a dimension of the mediating relationship between nurses' job contentment, organizational agility, and innovation process that preceding researches have failed to address. This article will furnish managers and decision makers in the healthcare sector with important insights for effective organisational strategy. Additionally, the study utilises an innovative methodology to comprehend this intricate relationship, enhancing the literature on methodological innovation. Thus, by implementing organizational agility, the entire healthcare systems can benefit from higher quality of services and increase value for the population.

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