THE DIGITAL LEADERSHIP BEHAVIOURS OF X, Y, Z GENERATION NURSES IN THE DELIVERY OF HEALTH SERVICES

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Abstract. Younger nurses are more active and agile in nursing leadership comparing to as senior nurses are about to retirement. Digital era and technology forces nurses to be more dynamic and adaptive. Thus, they try to behave as digital leaders. The aim of this study to link the relationship between young digital nurse leaders' organizational resilience and commitment in hospitals. To test this relationship, the data were collected from nurses in three groups: X, Y and Z generation. The data were collected by four scales and analysed by SPSS program. The results show that digital leadership has a positive effect on both organizational resilience and organizational commitment. Moreover, organizational resilience and organizational commitment is positively correlated. The young nurses have more digital leadership skills and behaviours comparing senior ones. But the perception of organizational resilience and commitment of the X generation nurses was higher than the Y and Z generations. The results of this study may guide to the managers of healthcare organization to pay attention young nurses in adapting technology and guide to senior nurses through applying digital leadership behaviours.

Keywords: Nurses, X, Y and Z generation, digital leadership, organizational resilience, organizational commitment

INTRODUCTION

In today's competitive environment brought by globalization, the expectations and wishes of managers and employees have led to the emergence of new approaches in the field of leadership. One of them is digital leadership that provides active use of technology. Digital leaders are people who know technology well and are open to continuous learning, apply digital, reflect on company goals and business results in the most positive way, and combine strategy, culture, communication, technology and data to achieve all these (Eberl & Drews, 2021). It will certainly be digital leaders who lead and drive transformation in the New Digital Age. This understanding, which proceeds with the power of persuasion, attaches importance to continuous communication and dialogue, accepts change, can shape its business strategy accordingly, is fed from an agile, inclusive and egalitarian culture based on cooperation rather than hierarchies, and is accountable in the most transparent way when necessary, will also provide important developments in the field of health care (Lapão, 2020).

Cross - generational work stress puts high-risk employment environments in healthcare organizations and hospitals. This causes decreasing productivity and negative organizational climate. There are X, Y, and Z generations in almost all organizations as in hospitals and

healthcare organizations. Researches shows that perceived behaviours across generations contribute to misunderstanding and conflict (Kaifi et al., 2012; Paros et al., 2022; Easton & Steyn, 2022). Intergenerational, conflict in the health care context is exacerbated by the promotion of younger nurses to leadership positions, requiring them to oversee senior and more experienced nurses. Because nurses serve in a high dynamic environment due to technology and Industry 4.0. Day by day they need to learn new technology and adapt them to sustain their work quality and the hospital they serve in.

I. Theoretical Background and Literature

Digital leadership theory sees technological learning as part of a social transfer, in which corporate practices are taught to new members through selective reinforcement. For this reason, nursing is a profession that requires manager and leader nurses, student nurses and nurses who have just started their profession, to learn and direct them in hospital environments (Mthiyane & Habedi, 2018). Therefore, nurses new to the profession and student nurses learn high-quality digital nursing skills with the help of supplements such as clinical supervision, post-clinical conferences, and clinical training.

The continuous implementation of technological innovations with digital leadership capabilities (Massaro, 2021) is crucial for the development of many organizations, including those in the healthcare industry, during the COVID-19 pandemic and future health crises (Basile et.al, 2022; Drago et.al, 2021).

As a result of technological innovations in the healthcare industry, robotic medical devices are widely applied to provide many types of medical services, including monitoring patients, performing surgeries, and managing vital functions such as nursing care (Guntur et al., 2019). Nurses with high digital knowledge who will provide these services, manage technology and adapt the changes in technology to health institutions are more needed today. These can be expressed as young and dynamic nurses with digital leadership characteristics. In other words, Generation Z can be defined as a nurse. Constantly and rapidly changing technology reveals sharp differences in knowledge, perception and management between generations. In this context, the aim of this study is to determine the digital leadership perceptions of X, Y, Z generations nurses in the digital age and to examine the relationship between these digital leadership perceptions, implicit resilience and commitment.

### I.1. The link between digital leadership, organizational resilience and commitment

Organizational commitment is defined as the desire of employees to stay in the organization, their identification with all the effectiveness and success of the organization, the loyalty and attitude of the employee to the organization, and the interest shown in order for the organization to be successful (Yiing & Ahmad, 2009). In this context, organizational resilience and agility are important concepts for nurses to serve to adapt to technology and hospital environment. Moreover, despite the intense job stress, this adaptability can only be overcome by highly resilient nurses. The concept of digital leadership is an important variable for nurses' organizational commitment and resilience.

Due to the critical role digital technologies play in patient care, their use in nursing practices is increasing. In general, nurses recognize the significant benefits such

technologies provide for patients and their families. These range from timely assessment information to patient monitoring, family information to nurses' workload and working conditions. For example, digital technologies can offer opportunities to tackle current problems and challenges in the healthcare industry. Many healthcare systems are facing challenges due to the lack of skilled nurses with technology knowledge and the growing demand for long-term care. Because X and Y generations may be insufficient in adapting to this technology, managing it and transferring it to other people. Therefore, generation Z nurses born into the world of technology play a critical role in this process. In this process, having only digital leadership knowledge and behaviors is often not enough. At the same time, nurses' organizational resilience and organizational commitment should be high in order to ensure the sustainability of institutions and hospitals. So which generation of nurse can provide this? X? Y? Or is it Z? This research will have a unique value in answering these questions not explained in the literature and will contribute to the literature by testing the following hypotheses.

I.2. Research Model and Hypotheses

Figure 1. Research Model
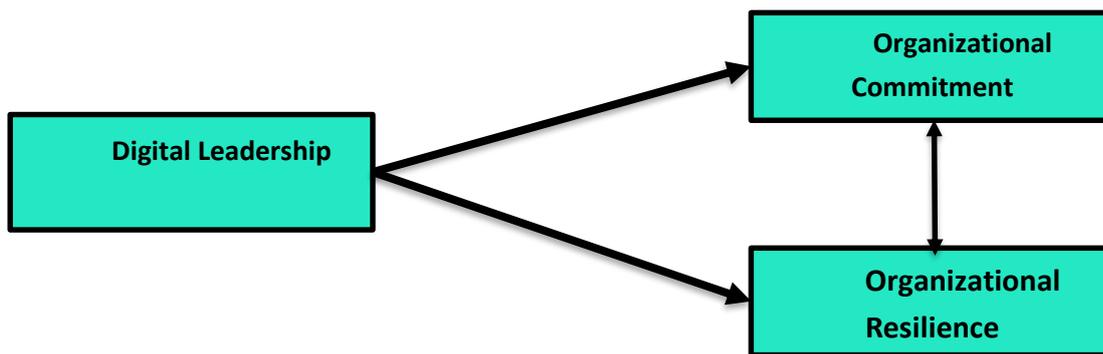
Hypotheses

H1: Digital leadership impacts organizational commitment in healthcare organizations.

H2: Digital leadership impacts organizational resilience in healthcare organizations.

H3: Organizational commitment relates with organizational resilience in healthcare organizations.

II. Methodology

II.1. Population and Sample

Data were collected from 136 nurses of Turkish healthcare organizations by three different scales. The questionnaire had 4 sections: the first section was regarding sample characteristics of the participants, such as gender, age, level of education, etc. The second scale was about

digital leadership developed by Zeike et al. (2019) and adapted to Turkish by Sürücü e al. (2022). It included 6 statements. The third section is about organizational commitment developed by Meyer et al. (1993) and adapted to Turkish by Bağcı & Akbaş (2016). It consisted of 15 statements. The forth scale is organizational agility developed by Sharifi & Zhang (1999) and adapted to Turkish by Akkaya & Tabak (2018). It consisted of 15 statements. The tool for collecting data was chosen to be a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree).

Characteristics of participants are as follows: 77.9% (106) of respondents was female while 22.1% (30) was male. 67.6% (92) of the respondents was graduated from health vocational high school, the rest were graduated from other high schools (32.4%). Moreover, we asked their current education level. 82.4% (112) had bachelor's degrees, while 17.6% (24) had a master's or Ph.D. degree. 37.5% (51) participants was Z generation that means they were born between 1996-2015, 40.4% (55) participants was Y generation that means they were born between 1980-1995 while 22.1% (30) participants was X generation that means they were born before 1980s.

II.2. Statistical Analysis

The analysis was executed using structural equation modelling with the SPSS 26 program. Before testing Hypotheses, we checked data normal distribution and reliability analysis. Cronbach Alpha (α) was used to measure internal consistency for reliability and the Skewness and Kurtosis were used to check the data normality distribution. Cronbach Alpha was found higher than 0.70 for each scale that showed the data is high reliable.

The Skewness and Kurtosis values should be between +2 and -2 that presents data has normal distribution (George, 2011). Table 1 presents the skewness and kurtosis has normal distribution. Thus, we applied parametric analysis methods such as regression, ANOVA and correlation in current research.

Table 1. Normal Distribution Analysis (N=136)

Scale	Min.	Max.	Mean	Std. D.	(α)	Skewness		Kurtosis		
						Statistics	SE	Statistics	SE	p value
Digital Leadership	1.00	5.0	3.84	0.48	0.92	-0.108	0.21	0.439	0.43	0.183
Organizational Commitment	1.00	5.00	3.16	0.86	0.93	0.719	0.21	0.906	0.43	0.256
Organizational Resilience	1.00	5.00	3.86	0.85	0.93	0.326	0.21	-0.455	0.43	0.192

III. Results

Characteristics of participants are as follows: the mean of age is 28.4; 40.9% (192) of the respondents were above 28 years, while 59.1% (277) were less than 28 years. 64.4% (302) of respondents were female, 35.6% (167) identified themselves as male. 39.0% (183) had high school degrees, 43.9% (206) had bachelor's degrees, while 17.1% had a master's or Ph.D. degree.

R value showing the positive and significant relationship between digital leadership and organizational commitment is 0.607. It can be stated that 36% (R^2) of organizational commitment depends on digital leadership behaviours. In other words, there is a positive and significant relationship between digital leadership and organizational commitments (p<0.001) (Table 2). Thus, Hypothesis 1(**H₁**) is supported (Digital leadership impacts organizational commitment in healthcare organizations).

Table 2 : Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	t value	F value	df1	df2	Sig.
1	,607ª	,368	,364	,68915	8,838	78,111	1	134	,000

a. Predictors: (Constant), Digital Leadership

R value between digital leadership and organizational resilience is 0.607. It can be stated that 61% (R^2) of organizational resilience depends on digital leadership behaviours. In other words, Regression test proved that there is a positive and significant relationship between digital leadership and organizational resilience (p<0.001) (Table 3). Thus, Hypothesis 2 (**H₂**) is also supported (Digital leadership impacts organizational resilience in healthcare organizations).

Table 3: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	t value	F value	df1	df2	Sig.
1	,781ª	,610	,607	,68024	14,475	209,514	1	134	,000

a. Predictors: (Constant), Digital Leadership

We also applied Pearson correlation to test the relationship between both independent (digital leadership) and dependents variables (organizational commitment and organizational

resilience). The findings of the study indicate that the digital leadership outcome has a strong positive correlation with organizational resilience (r=781; p=.000) and organizational commitment (r=607; p=.000). Organizational resilience has a positive correlation with organizational commitments (r=345; p=.000). This correlation supports Hypothesis 3 (**H₃**): Organizational commitment correlates with organizational resilience in healthcare organizations.

Table 4. Correlations

Variables		Digital Leadership	Organizational Commitment	Organizational Resilience
Digital Leadership	Pearson Correlation	1		
	Sig. (2-tailed)			
	N	136		
Organizational Commitment	Pearson Correlation	,607**	1	
	Sig. (2-tailed)	0		
	N	136	136	
Organizational Resilience	Pearson Correlation	,781**	,345**	1
	Sig. (2-tailed)	0	0	
	N	136	136	136

Correlation is significant at the 0.01 level (2-tailed).

We applied ANOVA Post Hoc test to compare generations (X, Y, Z) perceived digital leadership organizational resilience and organizational commitment.

As seen on Table 5, the model is significant(p=.000). In other words, digital leadership has a positive and significant impact on the organizational commitment and organizational resilience.

Table 5. ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Organizational Commitment	Between Groups	63,680	44	1,447	3,554	,000
	Within Groups	37,058	91	,407		
	Total	100,738	135			
Organizational Resilience	Between Groups	117,858	44	2,679	5,932	,000
	Within Groups	41,093	91	,452		
	Total	158,951	135			

Post hoc test showed that the digital leadership mean scores were higher in the Z generation than the X generation (p=0.025); however, there was no statistically significant difference between "X and Y generation" and "Y and Z generation" (p>0.05).

While the mean of organizational resilience scores was higher in the X generation than in the Y generation (p=0.016); however, there was no statistically significant difference between "X and Z generation" and "Y and Z generation" (p>0.05).

The mean of organizational commitment scores was higher in the X generation than in the Z generation (p=0.011); however, there was no statistically significant difference between "X and Y generation" and "Y and Z generation" (p>0.05).

Table 5: Multiple Comparisons

Bonferroni

Dependent Variable	(I) Generation	(J) Generation	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	Upper Bound
Digital Leadership	Y	X	,168	,218	1,000	-,36	,70
		Z	-,524	,254	,124	-1,14	,09
	Z	Y	,524	,254	,124	-,09	1,14
		X	,692*	,258	,025	,07	1,32
	X	Y	-,168	,218	1,000	-,70	,36
		Z	-,692*	,258	,025	-1,32	-,07
Organizational Resilience	Y	Z	-,111	,213	1,000	-,63	,40
		X	-,703*	,248	,016	-1,31	-,10
	Z	Y	,111	,213	1,000	-,40	,63
		X	-,592	,252	,060	-1,20	,02
	X	Y	,703*	,248	,016	,10	1,31
		Z	,592	,252	,060	-,02	1,20
Organizational Commitment	Y	Z	,471	,211	,082	-,04	,98
		X	-,267	,246	,842	-,86	,33
	Z	Y	-,471	,211	,082	-,98	,04
		X	-,737*	,250	,011	-1,34	-,13
	X	Y	,267	,246	,842	-,33	,86
		Z	,737*	,250	,011	,13	1,34

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

CONCLUSIONS

One of the most important factors that lead a company or firm to success is to have a successful and digital leader in digital age during Industry 4.0. Although leadership is a concept that is in our lives, digital leadership is a concept that has recently come to the fore and wondered. Digitalization has a positive effect on the individual performance of the personnel

by increasing the quality of business life, increasing the speed of work of the personnel, completing the tasks on time, reducing the rate of mistakes made in the works and ultimately affecting the motivation of the personnel. The presence of digital leaders in companies in the digitalization process also increases the individual performance of employees (Benitez et al., 2022; Abbasov & Tolay, 2021).

In literature, researches from the perspective of leadership and digitalism is generally related to organizational commitment and resilience in the field of health. For example, the innovative leadership practices are more conducive innovative work behaviour and work performance of the company (Purwonta et al., 2020; Zuraik & Kelly, 2019; Asbari et al., 2019). The more positive the employee's innovation practices are, the better employee's performance and organizational commitment will be. These findings are similar to our research result. And there are some other studies that support the result of current research, for instance, it has been found that transformational and digital leadership styles affect the performance of the organization positively and significantly (Madanchian et al., 2020; Al Khajeh, 2019). The organizational commitment is higher in organizations with digital competence (Yu & Moon, 2021). Cho, et al., (2019) found that transformational leadership increases organizational commitment, Puliwarna et al., (2023) found that digital competence has direct positive and significant effect on organization performance. Hack-Polay et al. (2022) conducted research on guiding flexibility in nursing practice and examined the impact of digital innovations and enhanced emotional education on nursing competencies. They found that nurses could develop more outstanding modern capabilities with exposure to increasingly used technologies in the healthcare sector. AI and digital technology and health-related engineering equipment can help reduce stress in the profession. Therefore, technology is not a threat. It is a necessary complement that can upskill nurses.

Health literacy, in particular, plays an important role in the delivery of health services by nurses. This is closely related to the digital leadership behaviours of nurses. The more effective the digital leadership behaviours are, the higher the sexual health and literacy levels will be. This is also important in the distribution of health services (Üstgörül, 2022). Lapão (2020) emphasized the importance of combining digital health with the leadership of nurses. A positive relationship was observed between transformational leadership and organizational commitment.

In local literature, there are some studies supports the results of current research. Aymaz (2014) found the positive the relationship between the perception of leadership behaviours and organizational commitment of nurses. Yağız (2022), on the other hand, examined the relationship between the behaviours of nurses in the pandemic process and their organizational resilience, and resulted the positive relationship between those variables. Canpolat (2012) evaluated the leadership and organizational commitment of nurses.

As seen in literature, there are different studies in the literature for organizational resilience, digital leadership and organizational commitment. However, the relationship between organizational resilience and organizational commitment, which defines nurses' digital leadership characteristics, has not been studied yet. This provides the originality of current research. For this reason, it is necessary to conduct research on the effects of organizational resilience and organizational commitment for nurses operating and working in

the digital age. Therefore, we examined the relationship between digital leadership, organizational resilience and organizational commitment of the perception of X, Y and Z generation nurses.

The results show that digital leadership has a positive effect on both organizational resilience and organizational commitment. Moreover, organizational resilience and organizational commitment is positively correlated. The young nurses have more digital leadership skills and behaviours comparing senior ones. But The perception of organizational resilience and commitment of the X generation nurses was higher than the Y and Z generations. The results of this study may guide to the managers of healthcare organization to pay attention young nurses in adapting technology and guide to senior nurses through applying digital leadership behaviours.

Study Limitations and Future Research

The sample population at this academic research hospital in Turkey did not represent the national nursing population. Therefore, the study's findings should be not generalized to the population. We reached just 136 nurses and analysed the data with parametric tests and a quantitate method.

For future studies, here are several opportunities for more study on the issue of digital leadership among different generations of nurses. First, a deeper assessment of the linkages between leadership style and organizational commitment in the concept of X, Y and Z generations leadership in nursing would provide data that can help in new and digital leadership development programming. Additional study employing a qualitative or mixed method should be undertaken to understand why digital leadership results in organizational commitment and resilience. Finally, while this study investigated the links between digital leadership and organizational commitment and quiet, it may be applied to a large sample.

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