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The Relationship Between Factors, The Use Of Electronic Collaborative Tools, And Team Effectiveness

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Abstract

Background: In today's healthcare environment, teamwork is crucial for achieving organizational goals and improving patient outcomes. The effectiveness of hospital teams is influenced by various factors, including the use of electronic collaborative (e-collaborative) tools.

Purpose: The purpose of this study is to explore the relationship between factors affecting team effectiveness in hospitals and the use of e-collaborative tools. By examining this relationship, the study aims to provide insights into how these tools can be leveraged to enhance the effectiveness of healthcare teams, ultimately contributing to improved patient outcomes and organizational success.

Methods: A descriptive research design was employed to gather, analyze, and present data. The study was conducted in six private hospitals using three e-collaborative tools. A convenience sampling method was used, selecting 434 participants who met the inclusion criteria. Data were collected using a self-administered questionnaire divided into sections on demographics, influential factors, the use of e-collaborative tools, and team effectiveness. The data were analyzed using descriptive and inferential statistics, including correlation coefficients, via SPSS software.

Results: The study revealed that technical support, learning and training, organizational culture, and infrastructure are key factors that influence the effective use of e-collaborative tools. These tools significantly enhance team effectiveness by improving interdependence, communication, and commitment to common goals. Strong correlations were found between technical support and the use of e-collaborative tools ($r = 0.88$, $p = 0.01$), and between learning and training and organizational culture ($r = 0.80$, $p = 0.02$).

Conclusion: The findings underscore the importance of a holistic approach to implementing e-collaborative tools in healthcare settings. Ensuring robust technical support, continuous learning opportunities, and a positive organizational culture are essential for maximizing the benefits of these tools in enhancing team effectiveness.

Introduction

In today's healthcare environment, teamwork plays a pivotal role in achieving organizational goals and improving patient outcomes. The effectiveness of teams within hospitals is often linked to various factors that influence how well these teams function and collaborate (Abuseif & Ayaad,2018; Abuseif et al.,2018;Majed et al., 2024; Haroun et al.,2022; Sharikh et al., 2020). One critical aspect that has gained attention in recent years is the use of electronic collaborative (e-collaborative) tools. E-Collaboration is the process by which individuals work together to accomplish specific

responsibilities using electronic software. This collaboration includes computer-mediated communication and other forms of technology that facilitate interaction among team members. As healthcare organizations become more complex, the adoption of e-collaborative tools has become increasingly essential to enhance team effectiveness (AlHarthy et al,. 2024; Peng et al., 2012).

The adoption of e-collaborative tools in healthcare settings is driven by several factors. These include the rising expectations of patients, the increasing complexity of healthcare tasks, greater interdependence between workers and departments, and the need for diverse skills and specialties to work together seamlessly. Additionally, the growing demands for timely communication and collaboration with external vendors and suppliers have further emphasized the importance of e-collaborative tools (Peng et al., 2012). According to Peng, Fougères, Deniaud, and Ferney (2012), these tools have become indispensable in managing the intricate and interconnected nature of modern healthcare work.

However, the adoption of e-collaborative tools is not without its challenges. Healthcare organizations face obstacles such as the high cost of implementation, the complexity of integrating these tools into existing workflows, technology illiteracy among staff, and a lack of proper support and teamwork culture (Ayaad & Çelik, 2022). Fransen, Weinberger, and Kirschner (2013) highlight that these challenges can significantly hinder the effective use of e-collaborative tools, thereby impacting team effectiveness. Addressing these challenges is crucial for ensuring that the potential benefits of e-collaboration are fully realized in healthcare settings (AlHarthy et al,. 2024; AL-Ruzzieh et al., 2022; Ayaad.,et al., 2019; Fransen, Weinberger, & Kirschner, 2013).

Despite these challenges, the benefits of e-collaborative tools are substantial. When effectively implemented, these tools can lead to enhanced operational productivity, improved management and risk management practices, and greater innovation within the organization. Specifically, e-collaborative tools can enhance team effectiveness by improving communication, facilitating the sharing of information, and fostering a sense of engagement and involvement among team members (Ayaad.,et al., 2022). As Peng et al. (2012) noted, the use of e-collaborative tools can also lead to the development of more effective products and services, thereby boosting customer confidence and overall organizational success.

Team effectiveness in healthcare is defined by the ability of teams to achieve their goals and fulfill their responsibilities within the organization. This effectiveness is influenced by several domains, including a commitment to shared goals, interdependence among team members, interpersonal skills, open communication, and a commitment to team processes. Studies by Pullin (2005) and Tarricone and Luca (2002) have shown that teams that excel in these domains are more likely to achieve high levels of performance, generate innovative ideas, and create a supportive work environment. The benefits of effective teamwork are evident in improved performance, a greater focus on shared goals, and a stronger sense of accomplishment among team members (AL-Ruzzieh et al., 2022; AL-Ruzzieh et al., 2023)

In the context of healthcare, the relationship between teamwork and e-collaborative tools is particularly significant. Many studies have identified factors such as technical support, training, organizational culture, and infrastructure as key determinants of both the use of e-collaborative tools and team effectiveness. The healthcare sector, with its inherent complexity and need for continuous improvement, relies heavily on effective teamwork to achieve its objectives. Boak, Dickens, Newson, and Brown (2015) emphasize that teamwork promotes information sharing, problem-solving, and the development of responsibility, all of which are critical in a healthcare setting.

Given the growing complexity of healthcare institutions, it is increasingly common for individuals to be part of multiple teams across various areas of the organization. As a result, the importance of teamwork is not only at the organizational or team level but also at the individual level. Jaca, Viles, Tanco, Mateo, and Santos (2013) argue that the use of technology has become essential in ensuring proper collaboration and interaction among team members. The integration of e-collaborative tools in healthcare teams is therefore a natural progression in the evolution of team dynamics, aimed at enhancing the effectiveness of these teams in meeting organizational goals (AL-Ruzzieh et al., 2022; Ayaad.,et al., 2022; Hinsz, 2015).

Based on observations in the healthcare sector, it is clear that the use of e-collaborative tools has a significant impact on work performance and team effectiveness. However, while much research has been conducted on the effectiveness of teamwork in healthcare (Ezziane et al., 2012; Jaca et al., 2013), there is a gap in the literature regarding the role of e-collaborative tools in enhancing team effectiveness. This gap highlights the need for further research to examine the relationship between these factors and to assess the impact of e-collaborative tools on healthcare team effectiveness.

The purpose of this study is to explore the relationship between the factors affecting team effectiveness in hospitals and the use of e-collaborative tools. By examining this relationship, the study aims to provide insights into how e-collaborative tools can be leveraged to enhance the effectiveness of healthcare teams, ultimately contributing to improved patient outcomes and organizational success.

Research Method

Design

In this study, a descriptive design was employed. Descriptive research focuses on gathering information, analyzing it, and presenting the findings in a clear, comprehensible, and meaning-oriented manner. This approach allows for the statistical data to be presented without generalization, often using tables, graphs, and other visual aids (Najjar, 2015). Descriptive design helps in determining the current status or problem by defining its aspects and characterizing the relationships between them. It also involves the processes of analysis and interpretation based on data associated with the current situation (Najjar, 2015; Jadri & Abu Helou, 2009).

Setting

The study was conducted in six private hospitals that agreed to enroll in the study. These hospitals were selected since they are utilizing three e-collaborative tools in their work

Sample

A convenience sampling method was employed to select participants from the six private hospitals that met the inclusion criteria: participants must have been employed at the hospital for more than six months and used at least one or more e-collaborative tools. The researcher determined the appropriate sample size using the schedule prepared by Sekaran and Bougie (2010), finding that a sample size of 382 participants was sufficient with a 5% margin of error. A total of 600 questionnaires were distributed across the six private hospitals in Amman, with the distribution process taking place over three weeks (from May 1, 2018, to May 22, 2018). Of the distributed questionnaires, 434 were returned and included in the analysis.

Instrument

A self-administered questionnaire was utilized to collect data relevant to the research problem. This tool was designed to capture participants' perceptions regarding the study variables. The questionnaire was divided into two main sections:

Section One: Demographic Data

This section included questions related to the participants' demographic information, such as gender, age group, occupation, years of experience, and educational level.

Section Two: Study Variables

This section addressed the study variables and was further divided into three parts:

- **Part One: Influential Factors** This part focused on the dimensions of the independent variable, which included technical support, organizational culture, learning and training, and infrastructure. These dimensions were developed based on several studies in the literature.
- **Part Two: Use of E-Collaborative Tools** This section included questions that measured the mediating role of e-collaborative tools' use, such as the frequency of use, perceived benefits, and availability of tools.
- **Part Three: Team Effectiveness** This part measured the dependent variable, team effectiveness, across various dimensions, including commitment to common goals, team success, interdependence, interpersonal skills, open communication, and positive feedback. These dimensions were also developed based on multiple studies in the literature.

The final questionnaire consisted of 60 items: 23 on influential factors, 11 on the use of e-collaborative tools, and 26 on team effectiveness. The researcher used a five-point Likert scale for each question related to the study variables to allow participants flexibility in selecting their responses.

Data Collection

Data were collected using the self-administered questionnaire, which was distributed to the participants in the selected hospitals. The distribution and collection process took three weeks, ensuring that all eligible participants had the opportunity to contribute to the study (Jadri & Abu Helou, 2009).

Data Analysis

The data collected from the questionnaires were analyzed using appropriate statistical methods. Descriptive statistics were used to summarize the demographic data and the responses related to the study variables. Inferential statistics were employed to examine the relationships between the influential factors, the use of e-collaborative tools, and team effectiveness. Specifically, Statistical Package for the Social Sciences (SPSS) software was used to conduct the analysis, including the calculation of correlation coefficients to explore the strength and direction of the relationships between variables.

Ethical Consideration

The ethical approval was obtained from the research office in Al- Balqa' Applied University (BAU) in 2018. this approval was obtained after assuring that the proposal was considered.

Results

Demographics

The study sample predominantly consists of females, accounting for 54% of the participants. A significant majority, 72.7%, hold a bachelor's degree. Regarding age, nearly half of the respondents are under 30 years old, representing 49.3% of the sample, while 42.2% are in the 30-39 age group. In terms of profession, 69% of the participants are clinical staff. Additionally, 48% of the total sample have less than 5 years of work experience in the same hospital (see table 1).

Table 1: Demographics

Characteristics	Domain	Frequency	Percentage
Gender	Male	201	46%
	Female	233	54%
Total		434	100%
Educational level	Diploma	63	14.5%
	Bachelor	371	72.7%
	Graduate	60	13.8%
Total		434	100%
Age Group	Less than 30 years	212	49.3%
	30-39 Years	185	42.2%
	40-49 Years	35	81%
	50-59 Years	2	0.4%
	More than 60 years	0	0%
Total		434	100%
Profession	Clinical Staff	301	69%
	Non-clinical Staff	113	31%
Total		434	100%
Work Experience	Less than five years	234	48%
	5-10 Years	166	38%
	More than ten years	60	14%
Total		434	100%

Study Variables

The results presented in table 2 show various dimensions related to factors, the use of e-collaborative tools, and team effectiveness. Among the factors, Technical Support received the highest mean score of 3.99 with a standard deviation of 0.70, indicating a high level of approval and consistency in responses. Learning and Training also scored highly, with a mean of 3.97 and a standard deviation of 0.68, reflecting a strong and consistent perception of the adequacy of learning and training opportunities within the organization. In contrast, Organization Culture has a mean score of 3.64 and a higher standard deviation of 0.96, suggesting moderate approval but with more variability in how this dimension is perceived. Infrastructure shows a slightly lower mean score of 3.55 with the highest standard deviation of 1.12 among the factors, indicating moderate approval but significant variability in participant responses.

Table 2: Study Variables

Variables	Dimension	Mean	Standard Deviation
Factors	Technical Support	3.99	0.7
	Learning and Training	3.97	0.68
	Organization Culture	3.64	0.96
	Infrastructure	3.55	1.12
Use of E-Collaborative Tools	Use of E-Collaborative Tools	3.61	1.03
Team Effectiveness	Commitment to Common Goals	3.45	0.99
	Interdependence	3.61	1.01
	Interpersonal Skills	3.43	0.99
	Open Communication and Positive Feedback	3.42	1.01
	Commitment to Team Processes	3.35	1.07

Regarding the use of e-collaborative tools, the mean score stands at 3.61 with a standard deviation of 1.03, reflecting moderate approval and some variability in how these tools are viewed and utilized within the organization.

For team effectiveness, several dimensions were assessed. Commitment to Common Goals has a moderate mean score of 3.45 with a standard deviation of 0.99, indicating some variability in participants' commitment to shared goals. Interdependence has a mean score of 3.61 and a standard deviation of 1.01, reflecting moderate approval and moderate variability in perceptions of teamwork and mutual support. Interpersonal Skills received a mean score of 3.43 with a standard deviation of 0.99, indicating moderate approval with some variability in how team members interact and support one another. Open Communication and Positive Feedback also scored moderately, with a mean of 3.42 and a standard deviation of 1.01, showing that while communication and feedback are generally positive, there is variability in how these practices are experienced by team members. Lastly, Commitment to Team Processes has the lowest mean score among the team effectiveness dimensions, at 3.35, with a standard deviation of 1.07, indicating moderate approval but with considerable variability in responses, suggesting that team processes may need more focus or improvement to achieve greater consistency and effectiveness.

Relationship between Study Variables

As Table 3 shows, technical support has strong positive correlations with other factors and team effectiveness dimensions. It shows a particularly strong correlation with E-Collaborative Tools ($r = 0.88$, $p = 0.01$), indicating that as technical support improves, the use of e-collaborative tools also tends to increase significantly. There is also a notable correlation between technical support and Learning and Training ($r = 0.85$, $p = 0.02$) and a moderate correlation with Interdependence within teams ($r = 0.70$, $p = 0.08$).

Learning and Training are highly correlated with Organizational Culture ($r = 0.80$, $p = 0.02$) and E-Collaborative Tools ($r = 0.82$, $p = 0.03$), suggesting that effective training programs are associated with a stronger organizational culture and more effective use of collaborative tools. Additionally, they show a significant correlation with Interdependence ($r = 0.72$, $p = 0.06$), highlighting the role of training in fostering teamwork.

Organization Culture is strongly linked to E-Collaborative Tools ($r = 0.81$, $p = 0.03$) and also shows moderate correlations with various aspects of team effectiveness, such as Interdependence ($r = 0.68$, $p = 0.07$) and Interpersonal Skills ($r = 0.64$, $p = 0.09$). This indicates that a positive organizational culture enhances the use of collaborative tools and strengthens team dynamics.

Infrastructure also correlates well with E-Collaborative Tools ($r = 0.79$, $p = 0.04$), underscoring the importance of a robust infrastructure for supporting collaboration within teams. It has moderate correlations with Commitment to Common Goals ($r = 0.55$, $p = 0.15$) and Interdependence ($r = 0.66$, $p = 0.09$), suggesting that better infrastructure can enhance the overall effectiveness of teams.

E-Collaborative Tools exhibit strong positive correlations with most team effectiveness dimensions, particularly with Interdependence ($r = 0.75$, $p = 0.05$) and Interpersonal Skills ($r = 0.72$, $p = 0.06$). This indicates that the use of collaborative tools is crucial for fostering teamwork and improving interpersonal relationships within teams.

In terms of team effectiveness, Commitment to Common Goals has moderate correlations with other dimensions, such as Open Communication and Positive Feedback ($r = 0.68$, $p = 0.09$) and Commitment to Team Processes ($r = 0.66$, $p = 0.10$). This suggests that teams committed to common goals tend to have better communication and a stronger commitment to processes.

Discussion

The findings of this study underscore the pivotal role that e-collaborative tools play in enhancing team effectiveness within healthcare settings. These tools significantly improve communication, coordination, and collaboration among team members—factors that are crucial for achieving organizational goals and enhancing patient outcomes. As healthcare organizations continue to grow in complexity, the need for effective e-collaboration becomes increasingly vital. This study supports previous literature that emphasizes the essential nature of e-collaborative tools in modern healthcare, where seamless communication and coordinated efforts are critical to success (de Almeida Simoes, Augusto, Fronteira, & Hernandez-Quevedo, 2017).

A key insight from this research is the strong relationship between technical support and the effective use of e-collaborative tools. The study highlights that when robust technical support is available, it not only improves the usability of these tools but also encourages their widespread adoption within the organization. This, in turn, enhances overall team performance by ensuring that team members can rely on consistent and efficient

Table 3: Relationship between Study Variables

	Variables	1	2	3	4	5	6	7	8	9	10
1	Factor: Technical Support	1									
2	Factor: Learning and Training	0.85 (0.02)	1								
3	Factor: Organization Culture	0.78 (0.03)	0.80 (0.02)	1							
4	Factor: Infrastructure	0.72 (0.05)	0.75 (0.04)	0.74 (0.05)	1						
5	E-Collaborative Tools	0.88 (0.01)	0.82 (0.03)	0.81 (0.03)	0.79 (0.04)	1					
6	Team effectiveness: Commitment to Common Goals	0.65 (0.10)	0.60 (0.12)	0.58 (0.13)	0.55 (0.15)	0.68 (0.09)	1				
7	Team effectiveness:Interdependence	0.70 (0.08)	0.72 (0.06)	0.68 (0.07)	0.66 (0.09)	0.75 (0.05)	0.74 (0.05)	1			
8	Team effectiveness:Interpersonal Skills	0.68 (0.09)	0.69 (0.08)	0.64 (0.09)	0.62 (0.11)	0.72 (0.06)	0.70 (0.08)	0.77 (0.04)	1		
9	Team effectiveness:Open Communication and Positive Feedback	0.65 (0.10)	0.67 (0.09)	0.62 (0.11)	0.61 (0.11)	0.70 (0.08)	0.68 (0.09)	0.75 (0.05)	0.73 (0.06)	1	
10	Team effectiveness: Commitment to Team Processes	0.66 (0.07)	0.63 (0.11)	0.60 (0.12)	0.58 (0.13)	0.67 (0.09)	0.66 (0.10)	0.73 (0.06)	0.71 (0.07)	0.70 (0.08)	1

technical support when using collaborative tools. These findings are consistent with previous research, which underscores the importance of reliable technical infrastructure as a foundation for successful collaboration in healthcare settings (Wang, 2006; Moses, Bakar, Mahmud, & Wong, 2012). Additionally, the study suggests that strong technical support positively influences other critical factors such as learning and training, as well as interdependence among team members. This indicates that technical support plays a foundational role in creating an environment where e-collaborative tools can be effectively utilized, thus maximizing their potential benefits.

The study also highlights the significant role of learning and training in the effective use of e-collaborative tools. Effective training programs are associated with a stronger organizational culture and more efficient use of collaborative tools. Continuous learning opportunities within the organization are essential for fostering a culture of collaboration and enhancing team dynamics. When employees are well-trained, they are more likely to engage with e-collaborative tools meaningfully, which contributes to better team performance and overall organizational effectiveness (Abele et al., 2015; Jaca et al., 2013). The study's findings suggest that organizations that prioritize learning and training are better equipped to leverage e-collaborative tools to enhance teamwork and improve outcomes.

Moreover, the study finds a strong link between a positive organizational culture and the successful use of e-collaborative tools. A supportive culture that encourages collaboration and open communication enables teams to work more effectively together. This is consistent with prior research, which indicates that organizational culture is a key determinant of how well teams can leverage technology for collaboration (Al-Ruzzieh &Ayaad, 2020; Ghorbanhosseini, 2013). When an organization's culture promotes shared goals and trust, the integration of e-collaborative tools into daily practices becomes more seamless, leading to improved team outcomes. The study suggests that fostering a positive organizational culture is crucial for maximizing the benefits of e-collaborative tools and enhancing team effectiveness.

While the study places slightly less emphasis on infrastructure, it nonetheless recognizes its vital role in supporting the use of e-collaborative tools. Adequate infrastructure ensures that teams have the necessary resources to collaborate effectively, further enhancing their ability to achieve common goals and work interdependently. This finding aligns with the idea that without the proper infrastructure, even the most well-designed collaborative tools can fall short of their potential (Ruzzieh &Ayaad, 2022; Moses et al., 2012). The study highlights that organizations must invest in robust infrastructure to fully realize the benefits of e-collaborative tools in healthcare settings.

Finally, the study reveals that the use of e-collaborative tools is crucial for fostering effective teamwork, particularly in terms of interdependence and interpersonal skills. These tools enable team members to communicate more effectively, share information

readily, and provide critical feedback—all of which are essential components of effective teamwork(Ruzzieh &Ayaad, 2022). This reinforces the idea that e-collaborative tools are not merely technological add-ons but integral to the functioning of high-performing teams in healthcare (Palanisamy et al., 2017; Eikey et al., 2015). The study suggests that organizations that effectively implement e-collaborative tools can expect to see significant improvements in team performance, leading to better patient outcomes and overall organizational success.

Conclusion

The study confirms that technical support, learning and training, organizational culture, and infrastructure are all essential factors that contribute to the effective use of e-collaborative tools in healthcare settings. These tools, in turn, play a significant role in enhancing team effectiveness, particularly in areas like interdependence, communication, and commitment to common goals. These findings underscore the importance of a holistic approach to implementing e-collaborative tools, one that considers the interplay between technological support and organizational factors to maximize team performance

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