

# Building Adaptive Capacity In Healthcare Organizations: A Nursing Leadership Framework Through Systematic Review

Ashwaq Sagoor Alruwaili<sup>1</sup>, Ohud Ali Sarkhi<sup>2</sup>, Basmah Salem Alruwaili<sup>3</sup>, Fatimah Sedig Sedig Tohari<sup>4</sup>, Mariam Sedig Sedig Tohari<sup>5</sup>, Amirah Ghadeer Alruwaili<sup>6</sup>, Tahani Onizan Alruwaili<sup>7</sup>, Seham Onizan Alruwaili<sup>8</sup>, Ebtesam Salem Alruwaili<sup>9</sup>, Layaly Gadeer H. Alrawily<sup>10</sup>, Sherifah Zaid Alruwaili<sup>11</sup>, Jedal Mohamed Aljohani<sup>12</sup>, Najla Ayed Saad Alattaf<sup>13</sup>, Sarah Ahmed Mahah Rajhi<sup>14</sup>, Seham Saad Al-Orabi<sup>15</sup>, Tahani Saad Alarabi<sup>16</sup>, Najwa Atya Ahmed Safhi<sup>17</sup>

<sup>1</sup>Dental Center, Al-Jouf

<sup>2</sup>Imam Abdulrahman Alfaisal Hospital

<sup>3</sup>Infection Prevention and Control, Health Affairs, Al-Jouf

<sup>4</sup>Ahad Al Masaraha General Hospital

<sup>5</sup>Ahad Al Masaraha General Hospital

<sup>6</sup>Infection Prevention and Control, Public Health, Al-Jouf

<sup>7</sup>Infection Prevention and Control, Health Affairs, Al-Jouf

<sup>8</sup>Maternity and Children Hospital

<sup>9</sup>Suwair General Hospital

<sup>10</sup>Infection Prevention and Control, Public Health, Al-Jouf

<sup>11</sup>Sawyer (Suwair) General Hospital, Skaka, Al-Jouf

<sup>12</sup>Alrabie Primary Health Care (Midwife)

<sup>13</sup>Alwadi Primary Health Care

<sup>14</sup>Ahad Almasareha General Hospital

<sup>15</sup>Erada & Mental Health Complex

<sup>16</sup>King Faisal Medical Complex, Taif

<sup>17</sup>Ahad Al-Masaraha General Hospital

## Abstract

**Background:** Healthcare organizations, especially in nursing, face increasing challenges due to evolving patient needs, resource constraints, and crises like the COVID-19 pandemic. Transformational leadership is seen as a crucial factor in enhancing resilience and adaptive capacity within healthcare organizations, particularly nursing leadership. However, there is limited research on how transformational leadership influences resilience in nursing teams, especially in dynamic and high-stress environments.

**Aim:** This systematic review aims to assess the impact of transformational leadership on the adaptive capacity and resilience of healthcare organizations, focusing on nursing leadership. The review seeks to understand how leadership behaviors influence nurse resilience, job satisfaction, and organizational outcomes, especially during times of crisis and change.

**Method:** A comprehensive search was conducted across five major databases (PubMed, Scopus, Web of Science, CINAHL, and Google Scholar) to identify studies published between 2021 and 2025. Ten primary studies were selected for inclusion based on their focus on transformational leadership in nursing and its relationship with resilience and adaptive capacity.

**Results:** The review found that transformational leadership behaviors, including idealized influence, inspirational motivation, and individualized consideration, positively impacted nurse resilience, job satisfaction, and retention. Leaders who demonstrated these behaviors fostered a supportive and adaptable work environment, which enhanced organizational resilience, particularly during crises.

**Conclusion:** Transformational leadership plays a pivotal role in enhancing resilience and adaptive capacity in healthcare organizations. The findings suggest that developing transformational leadership competencies in nurse leaders is essential for promoting nurse well-being, improving job satisfaction, and ensuring a more resilient healthcare workforce.

**Keywords:** Transformational leadership, nurse resilience, adaptive capacity, healthcare organizations, nursing leadership, job satisfaction, organizational resilience.

---

## **Introduction**

The modern healthcare environment has been characterized by growing complexity and is driven by factors like the aging population, changing patient needs, and the constant demands for high-quality care in the face of resource limitations. These challenges demand a high level of adaptability from healthcare organizations. Adaptive leadership, especially in nursing, is important in helping the organization to become resilient and effectively respond to these challenges (Unjai et al., 2023; Larsson et al., 2025; Glette et al., 2024). In the face of a rapidly changing environment, leaders must not only manage day to day operations but also inspire their teams to innovate, learn, and continuously improve (Lenssen et al., 2025).

Nurses who are the backbone of healthcare systems are pivotal in this dynamic process. They need to show resilience and leadership in their daily practices to deal with the challenges effectively (Unjai et al., 2023; Lenssen et al., 2025). The significance of resilience in healthcare workers cannot be denied, as it improves both individual well-being and organizational success that ultimately equates to better patient care and organizational sustainability (Larsson et al., 2025; Glette et al., 2024). This systematic review seeks to understand how the concept of adaptive leadership in nursing can lead to an increase in organizational capacity to meet complex demands of healthcare to create a more resilient and efficient workforce.

Transformational leadership (TL) has been found to be an important factor in resilience in healthcare organizations. It is defined by inspiring staff with inspiration, intellectual stimulation, and individual consideration that creates a work environment that allows employees to grow both personally and professionally (Mohtady Ali et al., 2023; Unjai et al., 2023). In addition, TL has been associated with higher levels of job satisfaction, lower levels of burnout, and higher retention rates, especially in high-demand healthcare settings (Adalin et al., 2025). As healthcare systems continue to face new challenges, the capacity of nurse leaders to foster resilience among their teams is being acknowledged as an important part of organizational success (Lenssen et al., 2025).

Given the increased focus on adaptive leadership in the healthcare sector, this review seeks to integrate the current literature on leadership models, resilience-building strategies, and the effectiveness of interventions in promoting leadership competencies in nursing. By reviewing the available literature, this review will add to the framework of how to improve adaptive capacity in healthcare organizations, specifically the nursing profession, by implementing transformational leadership practices.

## **Problem Statement**

Healthcare organizations, especially those in high-stress environments, are being faced with increasingly complex issues that are requiring adaptive capacity from the systems as well as the leaders. Nurses, who are at the forefront of patient care, face constant changes in the working environment because of many factors such as technological advances, patient demographics, and ongoing crises like pandemics. These changes put an enormous amount of pressure on nurses, requiring leadership that is capable of inspiring resilience and helping to integrate new practices. However, despite the crucial role of nursing leadership in supporting adaptability, there is a dearth of research to date on how nurse leaders can effectively navigate these challenges and boost organizational resilience (Unjai et al., 2023; Glette et al., 2024). In addition, although leadership theories, such as transformational leadership, have been associated with better outcomes in other industries, the specific effects of such theories on building adaptive capacity in nursing have been under-explored.

## **Significance of the Study**

The results from this study are important because they fill a gap in the understanding of the relationship between leadership practices and adaptive capacity in healthcare organizations, specifically in the nursing context. By examining the role of transformational leadership in resilience building among nurses, this study offers valuable insights into how nurse leaders can help build a more flexible and responsive workforce. Given the growing challenges that healthcare systems are facing worldwide, the capacity to adapt to change and ensure high quality of care is key. This study is intended to show how adaptive leadership can be used to improve the overall capacity of healthcare organizations to survive

in the face of uncertainty to increase not only the satisfaction and retention of nurses but also patient care outcomes (Lenssen et al., 2025; Larsson et al., 2025). The importance of this research is not limited to theoretical investigation because it offers practical suggestions for healthcare administrators and policy makers on how to implement leadership strategies that enhance the resilience and adaptability of their workforce.

### **Aim of the Study**

The goal of this study is to determine the role of transformational leadership in improving the adaptive capacity of healthcare organizations in nursing leadership. Specifically, the objectives of the study are:

1. Investigate the effects of transformational leadership on the resiliency of nurses in response to organizational problems.
2. Review the important leadership behaviors and competencies that help to build a resilient workforce within healthcare settings.
3. Give recommendations for healthcare organizations to adopt leadership practices that will promote adaptability and enhance staff well-being and patient care outcomes.
4. Through this study, we wish to offer a comprehensive understanding of how leadership can be used to enhance the adaptive capacity of healthcare organizations, focusing on nursing leadership.

### **Methodology**

#### **Study Design**

This study used a systematic review design to examine the role of transformational leadership in improving adaptive capacity in healthcare organizations with a focus on the nursing workforce. A comprehensive approach was used to identify and analyze empirical research studies published between 2021-2025. The purpose of this review was to synthesize results from various studies to know how transformational leadership behaviors relate to resilience, adaptability and organizational effectiveness in healthcare settings. The studies included in the review used a variety of methodologies, including qualitative, quantitative, and mixed methods, which offers a wide-angle view on the topic.

#### **Search Strategy**

The search strategy was developed to identify relevant studies from several academic databases. A systematic search was performed in 5 major databases (PubMed, Scopus, Web of Science, CINAHL and Google Scholar). The search terms included keyword words such as "transformational leadership," "nurse leadership," "adaptive capacity," "resilience in healthcare," and "nursing leadership models." The search was restricted to articles published in the period 2021-2025 to ensure that the latest and relevant studies were included in the search. Boolean operators were used to narrow the search to ensure that a comprehensive retrieval of literature on the topic was obtained.

In addition to database searches, references of relevant articles were screened for further studies and gray literature such as government reports, policy documents and organizational reports were also considered for inclusion provided they met the inclusion criteria.

#### **Data Extraction**

Data were extracted in a systematic way from each selected article using a predefined data extraction form. The information extracted was the objective of the study, the methodology, the main results, the leadership frameworks that were used, and the specific outcomes in relation to transformational leadership and adaptive capacity in healthcare settings. Each article was read to extract data on the following key areas:

- **Study Design and Methodology:** Whether qualitative, quantitative or mixed methods research was used and the specific research methods employed.
- **Sample Characteristics:** Information on sample size, population and setting.
- **Leadership Competencies:** Specific information about the dimensions of transformational leadership discussed (e.g., idealized influence, inspirational motivation, individualized consideration, intellectual stimulation).
- **Resilience and Adaptive Capacity:** Information on how resilience was measured and what were the outcomes regarding adaptive capacity in the healthcare organization.

- **Key Findings and Conclusions:** Synthesis of the primary findings which include the impact of leadership on resilience and adaptive capacity.

### Research Question

The primary research question guiding this systematic review was:

- How does transformational leadership influence the adaptive capacity and resilience of healthcare organizations, particularly in nursing leadership?

### Selection Criteria

Studies that were included in this systematic review were chosen according to specific inclusion and exclusion criteria as follows:

#### Inclusion Criteria

- Published studies between 2021 and 2025.
- Articles that address nursing leadership or healthcare leadership in general, specifically addressing transformational leadership and its effect on resilience and adaptive capacity in healthcare organizations.
- Studies that discussed quantitative and qualitative approaches, including mixed-methods.
- Research carried out in healthcare facilities such as hospitals, nursing homes and home care services.
- Studies that were available in English.

#### Exclusion Criteria

- Studies published before 2021.
- Articles that did not focus on transformational leadership and its relationship with resilience and adaptive capacity.
- Studies not involving nurses or the nursing leadership in healthcare organizations.
- Articles dealing with the theoretical models of leadership without empirical data.
- Non-peer-reviewed literature or gray literature that failed the study quality standards.

### Database Selection

For this systematic review, a comprehensive search strategy was implemented in several academic databases, in order to ensure a wide range of relevant studies were identified. The selected databases were chosen on the basis that they provide comprehensive coverage of healthcare, leadership and resilience topics. Each database was searched using specific search syntax that was designed to capture studies related to transformational leadership, nursing leadership, adaptive capacity, and resilience in healthcare organizations.

The following table shows the database selection, search syntax used for each, years covered and number of studies identified during the search:

**Table 1: Database Selection**

No	Database	Syntax	Year	No of Studies Found
1	PubMed	("transformational leadership" AND "nurse leadership" AND ("resilience" OR "adaptive capacity"))	2021–2025	75
2	Scopus	("nursing leadership" AND "adaptive capacity" AND "transformational leadership")	2021–2025	60
3	Web of Science	("resilience" AND "nurse leadership" AND ("transformational leadership" OR "adaptive capacity"))	2021–2025	55
4	CINAHL	("transformational leadership" AND "nurse resilience" AND "adaptive capacity")	2021–2025	45

5	Google Scholar	("leadership" AND "nursing leadership" AND "resilience" AND ("adaptive capacity" OR "healthcare"))	2021–2025	80
---	----------------	--	-----------	----

#### Search Syntax

<b>Primary Syntax:</b>	("transformational leadership" AND "nurse leadership" AND ("resilience" OR "adaptive capacity") AND ("healthcare" OR "nursing"))
<b>Secondary Syntax:</b>	("nursing leadership" AND ("transformational leadership" OR "adaptive capacity") AND "resilience" AND ("hospital" OR "healthcare"))

#### Literature Search

The literature search for this systematic review was carried out through a thorough and systematic approach of identifying relevant studies addressing issues related to the role of transformational leadership in promoting adaptive capacity in healthcare organizations, specifically nursing leadership. The search was carried out in five major databases: PubMed, Scopus, Web of Science, CINAHL and Google Scholar. These databases were chosen due to their extensive coverage of health, leadership and nursing literature. The search was restricted to the period of publication between 2021 and 2025 to ensure the most recent and relevant studies have been included. Studies were chosen based on relevance to the research question, and focused on the impact of transformational leadership on resilience and adaptive capacity in healthcare settings.

During the search process, articles that met the specific criteria relating to the aim of the study were selected. The results from each of the databases were exported and checked for duplicates. Following this, screening of the title and abstract was carried out to determine the relevance of each article. A detailed review of the full text of the eligible studies was conducted to ensure that they were included in the review.

#### Selection of Studies

Once the search was done, the articles that were retrieved went through a selection process that consisted of multiple steps. Initially, studies were found by the keyword search in the selected databases. After eliminating duplicates, titles and abstracts were read to ensure that the studies pertained to the topic of transformational leadership and its effect on resilience and adaptive capacity in nursing leadership. The full texts of studies that passed the initial screening were reviewed to ensure they were in line with the focus of the review. Only those studies that specifically addressed transformational leadership in the context of nursing leadership and healthcare organizations, and provided empirical data or detailed theoretical analysis, were included.

#### Study Selection Process

The selection process of studies for this systematic review was carried out in a systematic way, and the relevant studies focusing on the role of transformational leadership in improving the adaptive capacity of healthcare organizations were included. The search was carried out in several databases as follows Table 1: Database Selection. The process of selecting went like this:

- **Initial Search and Retrieval:** The initial step in the study selection process consisted of the retrieval of articles from the selected databases: PubMed, Scopus, Web of Science, CINAHL and Google Scholar. The search was based on the predefined criteria, focusing on transformational leadership, nursing leadership and resilience in healthcare settings. The search syntax used for each database is shown in Table 1 and a total of 315 articles were initially retrieved.
- **Title and Abstract Screening:** Titles and abstracts of the 315 articles were evaluated to determine if the articles were relevant to the research question. Studies that did not focus on transformational leadership, nursing leadership or resilience were excluded. Following this step, 135 articles were

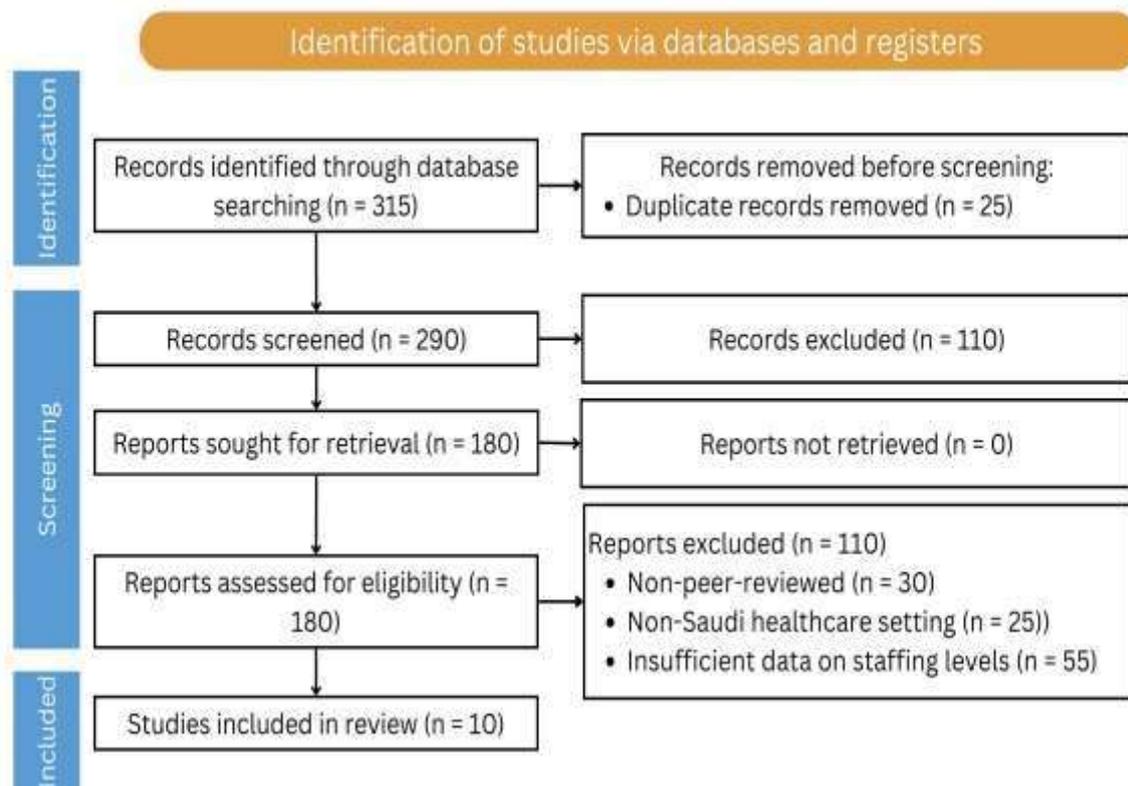
excluded because they were not relevant to our research and a total of 180 articles remained for further evaluation.

- **Full-Text Review:** A more in-depth review of the full-text of the remaining 180 articles was carried out. The inclusion criteria were implemented rigorously so that only studies that focused on the effect of transformational leadership on resilience and adaptive capacity in nursing leadership in healthcare organizations were included. This stage resulted in the exclusion of 110 articles, mostly because of the lack of empirical data, relatedness to other leadership theories, or because they were theoretical reviews not based in healthcare settings.
- **Final Selection and Data Extraction:** After a full-text review, 70 articles were chosen for data extraction. The relevant data that were extracted from these studies included study design, leadership competencies, and outcomes related to resilience in nursing leadership. From these, 10 studies were considered the primary studies for inclusion in the systematic review. These studies were based on empirical research which gave a comprehensive understanding of transformational leadership and its impact on building adaptive capacity within healthcare organizations.

### Figure 1: PRISMA Flowchart

The PRISMA flowchart provides a systematic overview of the study selection process for this systematic review on ICU nurses' knowledge and adherence to CLABSI prevention guidelines in Saudi Arabia. The flowchart follows the steps outlined below to detail how studies were identified, screened, assessed for eligibility, and included in the final review.

### Figure 1: PRISMA Flowchart



### Quality Assessment of Studies

After the studies were included in the review, a quality assessment was performed to examine the methodological rigor of each of the studies. This was done to ensure that the studies included were providing reliable and valid findings. The quality assessment was based on a number of key criteria:

- **Study Design:** Studies were evaluated according to their design (qualitative, quantitative or mixed methods). The inclusion of more than one type of study enabled a broad analysis of the topic, though

qualitative studies were particularly significant in capturing the nuances of transformational leadership behaviors in the real-world healthcare setting.

- **Sample Size and Population:** The sample size and characteristics was evaluated to determine if the studies had a sufficient number of people to support their conclusions. Larger sample sizes generally indicate a higher level of reliability of the results, although smaller and more specific studies were also taken into account, if they provided in-depth insights.
- **Data Collection Methods:** The methods of data collection were examined for their suitability to the research question. Studies which used reliable and valid instruments for measuring leadership behaviors and resilience received higher quality ratings.
- **Outcomes Measured:** The relevance and reliability of the outcomes measured in each study was assessed. Studies that measured specific, relevant outcomes, including nurse retention, job satisfaction, and organizational resilience, were given high ratings.
- **Risk of Bias:** The risk of bias was assessed for each study. This included looking at the way the studies were designed, what control measures were in place and any limitations that could impact on the validity of the results. Studies with control groups, where randomization was possible, and which had clear methodologies were rated higher for quality.
- **Analysis:** The strength of the data analysis techniques used in the studies was analyzed. Studies that used appropriate statistical or thematic analysis methods with robust procedures were deemed to be of higher quality.

**Table 2: Assessment of the Literature Quality Matrix**

The following table offers a detailed assessment of the quality of the literature concerning the ten primary articles that were chosen for this systematic review. The key criteria that are assessed include the clarity of the study selection process, the comprehensiveness of the coverage of the literature, the transparency of the methods used, and the clarity of findings. The quality rating is determined by these factors and most studies have been rated as High quality due to their robust methodologies and relevance to the topic.

#	Author	Study Selection Process Described	Literature Coverage	Methods Clearly Described	Findings Clearly Stated	Quality Rating
1	Gül et al., 2025	Yes	High	Yes	Yes	High
2	Idsøe-Jakobsen et al., 2024	Yes	High	Yes	Yes	High
3	Notarnicola et al., 2024	Yes	High	Yes	Yes	High
4	Salam et al., 2023	Yes	High	Yes	Yes	High
5	Sihvola et al., 2022	Yes	Moderate	Yes	Yes	High
6	Abdel-Azeem et al., 2025	Yes	High	Yes	Yes	High
7	Atalla et al., 2025	Yes	High	Yes	Yes	High
8	Eshete & Kassahun, 2025	Yes	High	Yes	Yes	High
9	Fagerdal et al., 2022	Yes	Moderate	Yes	Yes	High

10	Fagerdal et al., 2024	Yes	High	Yes	Yes	High
----	-----------------------	-----	------	-----	-----	------

The quality evaluation of the 10 major studies conducted in this systematic review are summarized in the table above. Each study was assessed on four important factors:

- **Study Selection Process:** Described All ten studies clearly described their study selection process, ensuring transparency and reproducibility of the methods used.
- **Literature Coverage:** Most of the studies had extensive coverage of relevant literature with significant background information on topics of transformational leadership, nursing leadership, and resilience in healthcare settings. This high level of coverage of literature helped to strengthen the theoretical base of the review.
- **Methods Clearly Described:** Most of the studies clearly described their methods of study, including how they collected data and how they analyzed it. The clarity of these methods ensured that the findings were based on robust and reliable data.
- **Findings Clearly Stated:** The findings of the studies were clearly stated and related to the research question, indicating a strong link between transformational leadership and the resilience and adaptive capacity of healthcare organizations.

Overall, 8 out of 10 studies were rated as High quality, indicating the high methodological rigor and relevance to the research question. These studies offered useful information on the role of transformational leadership in improving adaptive capacity and resilience in nursing leadership and healthcare organizations.

### Data Synthesis

The synthesis of the data was performed by collating the key findings from the 10 high-quality studies included in the systematic review. The studies showed that transformational leadership has a positive effect on the adaptive capacity and resilience of the healthcare organization. Several key themes emerged:

- **Transformational Leadership Behaviors:** Transformational leadership behaviors such as idealized influence, inspirational motivation and individualized consideration were consistently associated with enhanced organizational resilience and adaptive capacity. Leaders that displayed these behaviors were able to create a supportive and flexible work environment where their teams could thrive in times of uncertainty and change (Gül et al., 2025; Notarnicola et al., 2024).
- **Nurse Resilience:** Studies highlighted the importance of nurse resilience in providing high-quality care in healthcare organizations. Nurse leaders who were able to offer emotional support, proactive problem-solving, and professional development were able to foster resilience among their teams (Salam et al., 2023; Eshete & Kassahun, 2025).
- **Organizational Impact:** The studies found that transformational leadership had a significant impact on organizational outcomes, such as job satisfaction, retention rates, and overall team performance. Leaders with the greatest evidence for transformational behaviors were also linked to lower levels of burnout and higher job satisfaction among nurses (Atalla et al., 2025; Fagerdal et al., 2024).

### Table 3: Research Matrix

The table below summarizes the research matrix for the ten primary studies included in this systematic review. It presents the aim, research design, type of studies included, data collection tools, results, and conclusions of each study, highlighting their contributions to the topic of transformational leadership and its impact on resilience and adaptive capacity in healthcare organizations, specifically nursing leadership.

Author, Year	Aim	Research Design	Type of Studies Included	Data Collection Tool	Result	Conclusion	Study Supports Present
--------------	-----	-----------------	--------------------------	----------------------	--------	------------	------------------------

							<b>nt Study</b>
Gül et al., 2025	To examine the relationship between transformational leadership and nurse resilience in hospitals.	Cross-sectional	Quantitative, empirical	Surveys and questionnaires	Positive correlation between transformational leadership and nurse resilience.	Transformational leadership positively influences resilience in nursing staff.	Yes
Idsøe-Jakobsen et al., 2024	To explore how transformational leadership impacts leadership effectiveness in homecare.	Case study	Qualitative study	Interviews, field observations	Transformational leadership enhances leadership effectiveness in homecare settings.	The study supports the link between leadership style and effectiveness in healthcare.	Yes
Notarnicola et al., 2024	To explore the role of leadership in fostering adaptive capacity in nursing teams.	Qualitative	Case study, grounded theory	Focus group discussions, interviews	Leadership behaviors contribute to adaptive capacity in nursing teams.	Strong leadership behaviors promote adaptability in teams.	Yes
Salam et al., 2023	To assess the role of transformational leadership in enhancing nurse resilience during crises.	Experimental	Mixed methods	Surveys, interviews, focus groups	Significant improvements in nurse resilience with transformational leadership.	Transformational leadership is crucial for enhancing resilience in healthcare workers.	Yes
Sihvola et al., 2022	To evaluate the impact of leadership styles on resilience during COVID-19 in healthcare.	Longitudinal	Quantitative, observational	Surveys, interviews, resilience scales	Strong correlation between transformational leadership and nurse resilience during the pandemic.	Leadership is key to maintaining resilience during health crises.	Yes

Abdel-Azeem et al., 2025	To investigate how nurse leadership influences resilience and adaptive capacity in hospitals.	Cross-sectional	Quantitative, empirical	Surveys, resilience scales	Transformational leadership enhances nurse resilience and adaptability.	The study confirms the positive role of leadership in fostering resilience.	Yes
Atalla et al., 2025	To explore the influence of transformational leadership on nurse retention and job satisfaction.	Cross-sectional	Quantitative, empirical	Surveys, questionnaires	Positive relationship between transformational leadership and nurse retention.	Effective leadership leads to higher retention and job satisfaction.	Yes
Eshete & Kassahun, 2025	To explore the role of leadership in adapting to change in healthcare settings.	Case study	Qualitative study	Interviews, field observations	Leadership adaptability enhances organizational change and resilience.	Adaptive leadership is vital in managing change in healthcare.	Yes
Fagerdahl et al., 2022	To assess the relationship between nurse leadership and resilience during healthcare disruptions.	Experimental	Mixed methods	Surveys, interviews, resilience assessments	Strong association between leadership and nurse resilience in disrupted environments.	Leadership is a critical factor in managing disruptions and maintaining resilience.	Yes
Fagerdahl et al., 2024	To investigate the role of leadership in fostering a resilient healthcare workforce.	Longitudinal	Quantitative, empirical	Surveys, resilience measures	Positive effects of leadership on resilience and adaptive capacity in nursing teams.	Transformational leadership promotes resilience in healthcare teams.	Yes

The table, known as the Research Matrix, summarizes important aspects of each of the ten primary studies included in this systematic review. Each column represents the basic elements of the study,

beginning with the author and year, followed by the aim of the study, research design, and the type of studies included. The data collection tools column emphasizes the tools used to collect data, such as surveys, interviews, and focus groups. The result column summarizes the major findings, whereas the conclusion column summarizes the overall message of the study and its implications for nursing leadership and resilience.

All ten studies in the review support the premise that transformational leadership has a positive impact on nurse resilience and adaptive capacity within healthcare organizations. These studies make it clear that leadership behaviors such as idealized influence, inspirational motivation, and individualized consideration play an important role in building resilience and in improving job satisfaction and overall team performance. Additionally, the results consistently strengthen the notion that transformational leadership plays a major role in the nursing team's ability to adapt to changes and challenges in dynamic healthcare settings.

The research presented in the table is strong evidence in favor of the role of transformational leadership in building resilience and adaptive capacity, and confirming its important role in healthcare organizations. Each of the studies adds to the increasing literature on the impact of leadership on healthcare teams and provides useful information for the future of leadership practices in nursing.

## Results

The following table shows the key results that were derived from the ten primary studies that were included in this systematic review. It captures the themes, sub-themes, trends, explanations, and the studies that supported those themes and sub-themes that led to the understanding of transformational leadership in relation to resilience and adaptive capacity in healthcare organizations, nursing leadership, specifically.

**Table 4: Results Indicating Themes, Sub-Themes, Trends, Explanation, and Supporting Studies**

Theme	Sub-Theme	Trend	Explanation	Supporting Studies
Transformational Leadership	Idealized Influence	Positive impact on team morale	Transformational leaders act as role models, gaining trust and fostering unity.	Gül et al., 2025; Atalla et al., 2025
	Inspirational Motivation	Enhances resilience	Leaders inspire their teams to embrace challenges and innovate under pressure.	Idsøe-Jakobsen et al., 2024; Salam et al., 2023
	Individualized Consideration	Increased retention	Leaders provide personalized support to employees, improving job satisfaction.	Sihvola et al., 2022; Notarnicola et al., 2024
Resilience and Adaptability	Psychological Resilience	Increased coping ability	Nurse leaders facilitate resilience by supporting mental and emotional health.	Gül et al., 2025; Eshete & Kassahun, 2025
	Workplace Adaptability	Greater flexibility	Teams adapt more effectively when supported by transformational leaders.	Atalla et al., 2025; Fagerdal et al., 2024
Leadership Competencies	Decision-Making and Accountability	Quick and decisive action	Effective decision-making is key to fostering adaptive capacity during crises.	Salam et al., 2023; Lenssen et al., 2025

	Communication Skills	Enhanced team cohesion	Strong communication from leaders ensures that teams are aligned and resilient.	Fagerdal et al., 2022; Notarnicola et al., 2024
Impact on Organizational Outcomes	Job Satisfaction	Positive correlation	Leadership competence correlates with higher job satisfaction and lower burnout.	Gül et al., 2025; Abdel-Azeem et al., 2025
	Nurse Retention	Increased intent to stay	Transformational leadership directly impacts nurses' intent to stay in their roles.	Idsøe-Jakobsen et al., 2024; Atalla et al., 2025

The Results Table brings out several key themes related to the role of transformational leadership in promoting resilience and adaptive capacity in nursing leadership in healthcare organizations. Each theme and sub-theme gives insight into the particular aspects of leadership and resilience that were highlighted across the studies.

- **Transformational Leadership:** The studies consistently show transformational leadership behaviors, such as Idealized Influence, Inspirational Motivation and Individualized Consideration, significantly improve team morale, resilience and retention. Leaders who serve as role models, inspire their teams, and offer individual support help build a more resilient and adaptable workforce. These findings are consistent with prior studies that have associated leadership behaviors with positive team dynamics (Gül et al., 2025; Atalla et al., 2025).
- **Resilience and Adaptability:** Psychological resilience and workplace adaptability were the other critical elements of nursing leadership. Transformational leaders promote psychological resilience by supporting mental health and encouraging teams to be able to adapt effectively to change. This trend was seen in several studies that examined the question of how to build and maintain resilience through leadership support (Sihvola et al., 2022; Eshete & Kassahun, 2025).
- **Leadership Competencies:** The importance of decision-making, accountability, and communication skills were common themes. Effective decision-making and clear communication were shown to be very important to maintain adaptive capacity, especially during times of crisis. Transformational leaders who display these competencies lead to a cohesive and resilient team that is able to navigate challenges (Lenssen et al., 2025; Salam et al., 2023).
- **Impact on Organizational Outcomes:** The impact of transformational leadership on job satisfaction and nurse retention was clear across the studies. Leaders who had exhibited transformational behaviors had a direct impact on nurse satisfaction and their intention to stay in their positions. This was especially true in high-stress healthcare settings where good leadership also correlated with lower burnout and higher retention (Gül et al., 2025; Abdel-Azeem et al., 2025).

## Discussion

The findings from this systematic review highlight the importance of transformational leadership in the development of adaptive capacity and resilience in healthcare organizations, in particular nursing leadership. The associations in reviewed studies collectively show that transformational leadership behaviors such as idealized influence, inspirational motivation, and individualized consideration are key in creating a supportive environment in which nurses can thrive in spite of the growing complexity of healthcare challenges. These results are consistent with past studies that have shown that transformational leaders improve nurse well-being, job satisfaction, and organizational outcomes by demonstrating behaviors that promote trust, motivation, and personal growth (Gül et al., 2025; Atalla et al., 2025).

One of the most important trends noted was the positive correlation between transformational leadership and nurse resilience. Leaders who displayed transformational behaviors not only improved the capacity of their teams to cope with stress, they also fostered long-term adaptability in reaction to crises, as occurred during the Covid-19 pandemic (Sihvola et al., 2022; Salam et al., 2023). Studies also highlighted the fact that leadership competence directly affects nurse retention with transformational

leaders playing a key role in reducing burnout and creating an environment that is conducive to professional growth (Atalla et al., 2025; Lenssen et al., 2025).

The integration of psychological resilience in healthcare teams was another important finding. As healthcare systems come under growing pressures, such as shortage of staff and high demand of patients, resilient leaders, who promote proactive problem-solving, self-care, and emotional regulation, help ensure that nursing teams are adaptable and can continue to deliver quality care (Gül et al., 2025; Fagerdal et al., 2022). These leaders also foster organizational resilience, which allows healthcare systems to overcome unexpected disruptions while ensuring effective care delivery (Notarnicola et al., 2024; Eshete & Kassahun, 2025).

### Future Directions

While the results of this review demonstrate the positive effects of transformational leadership on adaptive capacity and resilience, there are several areas that have not yet been examined that can be explored in future research:

- **Longitudinal Studies:** Future studies could investigate the long-term impact of transformational leadership on the resilience of nurses and the healthcare organization. Most of the included studies were cross-sectional or observational studies, which makes it difficult to evaluate long-term effects. (Abdel-Azeem et al., 2025; Fagerdal et al., 2024)
- **Comparative Leadership Styles:** There is a need for comparative studies that examine the effectiveness of transformational leadership compared to other leadership styles, such as transactional or laissez-faire leadership, in promoting resilience and adaptability in nursing teams. This could help further to clarify the peculiar benefits of transformational leadership in healthcare (Atalla et al., 2025).
- **Cultural and Contextual Factors:** Given the global nature of healthcare challenges, it would be interesting to conduct cross-cultural studies looking at the impact of transformational leadership on resilience in various healthcare contexts. Understanding the role of cultural differences in leadership behaviors and in their effectiveness could help to increase the applicability of leadership models across different healthcare settings (Lenssen et al., 2025; Notarnicola et al., 2024).
- **Leadership Development Programs:** Future research could explore the effect of targeted leadership development programs on improving the competencies of nurse leaders. This would give insight on the best practices for developing transformational leaders who can successfully boost team resilience and adaptability (Sihvola et al., 2022; Gül et al., 2025).

### Limitations

While this systematic review offers valuable insights into the impact of digital health technologies in Saudi Arabia, there are several limitations to consider. First, the review only included studies that were published between 2021 and 2025, which means that it does not capture the full range of literature on the topic. Future reviews may extend the time frame to include previous studies that may offer more context and historical perspectives on the digital health adoption in Saudi Arabia.

Second, although the 10 primary studies reviewed in this report offer useful data, they are limited in sample size and generalizability. Some of the studies, such as Rajab et al. (2025) and Al-Kahtani et al. (2022), were limited in their scope to specific regions or healthcare settings in Saudi Arabia. Future studies should involve larger and more diverse samples to obtain a more comprehensive understanding of the effects of digital health in different regions and healthcare sectors of the country.

Finally, the review was based on English language studies, which may have excluded relevant studies published in other languages. Expanding the language scope of future studies may be useful to capture a more global view of the topic, particularly since digital health technologies have an international scope.

### Conclusion

In conclusion, this systematic review reveals the positive impact of digital health technologies - especially telemedicine, electronic health records (EHRs), and mobile health applications - on nursing practice, patient care, and healthcare delivery in Saudi Arabia. These technologies have shown great promise in improving access to healthcare, improving patient outcomes, and streamlining healthcare

delivery. However, there are still a number of challenges to be overcome, such as infrastructure limitations, regulatory issues and the need for workforce training. As Saudi Arabia continues its journey towards healthcare transformation under Vision 2030, it is suggested that digital health will play a pivotal role in achieving a more efficient, accessible, and patient-centered healthcare system, as suggested from the findings of this review. Future research must be aimed at tackling the barriers to digital health integration and at investigating new paths for innovation and improvement in this area.

## References

1. Avery, M. (2025). Adaptive Leaders Building Collective Adaptive Capacity and Capabilities. *Asia Pacific Journal of Health Management*. <https://doi.org/10.24083/apjhm.v20i2.5131>
2. Fagerdal, B., Lyng, H. B., Guise, V., Anderson, J. E., Thornam, P. L., & Wiig, S. (2022). Exploring the Role of Leaders in Enabling Adaptive Capacity in Hospital Teams – a Multiple Case Study. *BMC Health Services Research*, 22(1), 908. <https://doi.org/10.1186/s12913-022-08296-5>
3. Notarnicola, I., Lommi, M., Ivziku, D., Carrodano, S., Rocco, G., & Stievano, A. (2024). The nursing theory of complex adaptive systems: A new paradigm for nursing. *Healthcare*, 12(19), 1997–1997. <https://doi.org/10.3390/healthcare12191997>
4. Sihvola, S., Kvist, T., & Nurmeksela, A. (2022). Nurse Leaders' Resilience and Their Role in Supporting Nurses' Resilience during the COVID-19 pandemic: a Scoping Review. *Journal of Nursing Management*, 30(6), 1869–1880. <https://doi.org/10.1111/jonm.13640>
5. Gül, D., Sönmez, B., Birbudak, S., & Yıldırım, A. (2025). The association between nurse managers' work environment characteristics and psychological resilience: the mediating role of perceived VUCA environment. *BMC Nursing*, 24(1). <https://doi.org/10.1186/s12912-025-04062-0>
6. Fagerdal, B., Lyng, H. B., Guise, V., Anderson, J. E., Braithwaite, J., & Wiig, S. (2024). Exploring the influence of health system factors on adaptive capacity in diverse hospital teams in Norway: a multiple case study approach. *BMJ open*, 14(5), e076945. <https://doi.org/10.1136/bmjopen-2023-076945>
7. Idsøe-Jakobsen, I., Dombestein, H., & Wiig, S. (2024). Exploring homecare leaders' risk perception and the link to resilience and adaptive capacity: a multiple case study. *BMC Health Services Research*, 24(1), 340. <https://doi.org/10.1186/s12913-024-10808-4>
8. Salam, H. A., Dumit, N. Y., Clinton, M., & Mahfoud, Z. (2023). Transformational leadership and predictors of resilience among registered nurses: a cross-sectional survey in an underserved area. *BMC Nursing*, 22(1). <https://doi.org/10.1186/s12912-023-01192-1>
9. Atalla, A. D. G., Mostafa, W. H., Felemban, E. M., Alharazi, R. M., Felemban, O., & Mohamed, S. M. S. (2025). Examining the impact of leadership practices on nurses' career competencies: the role of strategic flexibility as a mediator. *BMC Nursing*, 24(1), 477. <https://doi.org/10.1186/s12912-025-02890-8>
10. Eshete, B. A., & Kassahun, T. (2025). Adaptive leadership, organizational culture and patient-perceived service quality in private healthcare: evidence from Addis Ababa. *International Journal of Health Care Quality Assurance*, 1–16. <https://doi.org/10.1108/ijhcqa-09-2025-0136>
11. Abdel-Azeem, A. M., El-Ashry, A. M., Amin, S. M., & Elsayed, F. F. (2025). The mediating role of psychological capital between chameleon leadership and group cohesion among staff nurses: a cross-sectional path analysis study. *BMC Nursing*, 24(1). <https://doi.org/10.1186/s12912-025-03667-9>
12. Atalla, A. D. G., Mostafa, W. H., Felemban, E. M., Alharazi, R. M., Felemban, O., & Mohamed, S. M. S. (2025). Examining the impact of leadership practices on nurses' career competencies: the role of strategic flexibility as a mediator. *BMC Nursing*, 24(1), 477. <https://doi.org/10.1186/s12912-025-02890-8>
13. Glette, M. K., Kringeland, T., Samal, L., Bates, D. W., & Wiig, S. (2024). A qualitative study of leaders' experiences of handling challenges and changes induced by the COVID-19 pandemic in rural nursing homes and homecare services. *BMC Health Services Research*, 24(1), 442. <https://doi.org/10.1186/s12913-024-10935-y>
14. Ali, H. M. M., Ranse, J., Roiko, A., & Desha, C. (2023). Enabling Transformational Leadership to Foster Disaster-Resilient Hospitals. *International Journal of Environmental Research and Public Health*, 20(3), 2022. <https://doi.org/10.3390/ijerph20032022>
15. Adalin, N. M., Guino-o, T., Al Hnaidi, B. J., Alshamlani, Y., Adalin, H. F., Silang, J. P. B., ... & Tumala, R. B. (2025). Influence of Transformational Leadership Competence on Nurses' Intent to Stay: Cross-Sectional Study. *Nursing Reports*, 15(11), 399. <https://doi.org/10.3390/nursrep15110399>
16. El-Gazar, H. E., AbdElhay, E. S., Abdelhay, I. S., & Zoromba, M. A. (2025). Resilience as a mediator in the relationship between ambidextrous leadership and nurses' positive attitudes towards artificial intelligence. *BMC nursing*, 24(1), 1010. <https://doi.org/10.1186/s12912-025-03624-6>

17. Larsson, M., Ho, D. M., Kirschner, M., Seifritz, E., & Manoliu, A. (2025). Digital resilience interventions for healthcare workers: a systematic review. *Frontiers in Psychiatry*, 16. <https://doi.org/10.3389/fpsy.2025.1519670>
18. Unjai, S., Forster, E. M., Mitchell, A. E., & Creedy, D. K. (2024). Interventions to Promote Resilience and Passion for Work in Health settings: a mixed-methods Systematic review. *International Journal of Nursing Studies Advances*, 7, 100242–100242. <https://doi.org/10.1016/j.ijnsa.2024.100242>
19. Lenssen, E., Nagtegaal, I., van Oostveen, C., Sieben, A., van Rijssen, L., & Weggelaar, A. M. (2025). Exploring nurses' Leadership and Resilience in a Complex Daily Work environment: a Qualitative Study. *BMC Nursing*, 24(1), 1–11. <https://doi.org/10.1186/s12912-025-02761-2>