ISSN: 2632-2714

Comprehensive Review of Nursing Leadership and Its Impact on Healthcare Systems

¹Abdulrahman Hussein Alotaibi, ²Zaid Saleh Alyami, ³Mohammed Hassan Alzaqani, ⁴Meshal Ahmed Al raqi, ⁵Saleh Hussein Yahya Al Mansour, ⁶Khalid Mohammed Ibrahim Almusallam, ⁷Abdullah Saleh Hassan Alyami, ⁸Faisal Nasser Yahya Al Murdif, ⁹Ali Hashel Hassan Al zubaid, ¹⁰Hadi Hashl AL Zubayd

1,2,3,4,5,6,7,8,9,10 Ministry of Health, Saudi Arabia

¹aalotaibi236@moh.gov.sa

²Zaida@moh.gov.sa

³malzagany@moh.gov.sa

⁴Maalraqi@moh.gov.sa

⁵sahualmansour@moh.gov.sa

⁶Kmalmusallam@moh.gov.sa

⁷absalyami@moh.gov.sa

⁸Fnalmurdif@moh.gov.sa

⁹<u>Aalzabaid@moh.gov.s</u>a

¹⁰haLzubayd@moh.gov.sa

Abstract

Nursing leadership, thus, is very influential in the improvement of health systems since the leader is responsible for ensuring quality and efficiency in the discharge of tasks and responsibilities. This paper aims to overview the principles of nursing leadership, the effects it produces on the healthcare system issues that modern nursing leaders experience, and approaches to optimize their leadership. In this paper, a synthesis of the systematic literature review, qualitative research, and quantitative data has been used to offer an understanding of how system-level nursing leadership impacts health system outcomes. Consequently, the outcomes of the study support the roles of transformational leadership styles, interdisciplinary teamwork, and training leadership development to enhance the delivery of present-day health care.

Keywords-Nursing leadership, healthcare systems, patient outcomes, transformational leadership, interdisciplinary collaboration, workforce development.

Introduction

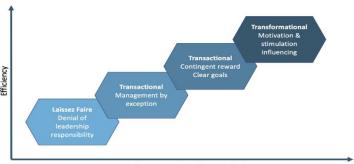
Nursing leadership occupies a critical role in the contemporary models of perceiving the healthcare systems. Both the practicing theory of nursing leadership and the conceptual foundation of this field posit that nursing leaders are able to shape the behavior of their subordinates and also create an impact on the total organizational environment by raising the bar of standards of affection for patient care, judicious utilization of available resources, and encouraging the emergence of new ideas. Despite the existing challenges in areas of the workforce, advances in practicing technologies, and an unceasingly complicated patient populace, effective and competent nursing leadership is central to healthcare organizations' fitness and performance.

This paper reviews the potential effect of leadership in nursing in health organizations and particularly has considered the application of leadership to enhance patient outcomes, address workforce issues, and bring about system change.

Literature Review

Theories of Nursing Leadership

Nursing leadership is complex and indispensable in healthcare systems and is exercised according to the applicable theories. Some of the notable theories available include transformational, transactional, and situational theories. The two theories provide different perspectives on leadership qualities and approaches to leadership in nursing environments.



Engagement (Passive to Active)

Transformational Leadership

The approach of transformational leadership, which focuses on the appeal for transformation, incentives, and integration of nursing teams, is especially suitable for this highly cooperative and dynamic environment of nursing. Managers, from this perspective, communicate with the members of their team in a personal way and try to link personal objectives to organizational objectives(Haller & Stevens, 2019). In relation to this, transformational leadership creates a common understanding that people work towards and encourages people to go the extra mile and find ways of coping with change.

Numerous studies conducted on the relationship between transformational leadership and nursing students show positive results. Research shows that practicing nurses with leaders who exercise transformational leadership are happier in their jobs, less burned out, and feel that their careers fulfill them more. Moreover, this leadership style has been linked with better health results such as a low rate of medical mistakes, high quality, and satisfaction among patients.

Transactional Leadership

On the other hand, Transactional leadership is structured on procedures, formalism, and a system of reward. It is the type of leadership that can be utilized to promote working effectiveness and the standard of adherence to rules. In nursing, transactional leaders tend to dwell more on what is carried out in the present, and realistic goals and objectives are set, most especially through the reward system that relates performance to standard requirements.

Transactional leadership is more likely to maintain coasting than to change and create new strategies on its own in the context of progressive healthcare organizations(Haller & Stevens, 2019). Thus, the implementation of transformations along with transactions may create a solid basis for building an effective structure while permitting leaders to be as creative as possible to achieve plans that meet both current and future requirements.

Situational Leadership

Situational leadership particularly enlightens leaders on the flexibility of their leadership based on the type of situation. This theory states that there is no ideal leadership style as all or some aspects of situational leadership are applied depending on the condition present for the leadership process. For instance, an organizational setting may require an authoritative style during an emergency, such as managing a large number of casualties, or a simple routine procedure may call for a consultative approach to handling things.

Situational leadership is especially important in the current complex healthcare organizations, and leaders who employ it display great versatility. In this way, they can apply tailored programs to meet the demands of each situation and improve team performance and patient results.

Impact on Patient Outcomes

The impact of nursing leaders on patients is rather positive. Leadership nourishes safety, accountability, and cross-disciplinary organization at the workplace. Four specific organizational factors in relation to nursing leaders' efforts to enhance the quality of care and patient satisfaction

ISSN: 2632-2714

are identified by a review of related scholarly studies.

Enhancing Patient Safety

Nursing leadership is vital to the creation of a safety culture in healthcare organizations. Managers should promote cultures that will allow employees to come out and disclose mistakes or accidents that almost occurred. This perspective is critical for naming organization shortcomings and putting corrective actions in place to avoid the next disaster.

Hospitals with strong nursing leadership have fewer incidents of medical mistakes as well as adverse events. This way, nursing leaders can ensure implementation that is in congruence with evidence-based practices, where ongoing education is prominent to support safety in care delivery.

Improving Care Quality

Leadership also plays a key role in the quality of patient care that will be given out to the patients. Managers who continually encourage teamwork and interdisciplinary collaboration achieve a good working relationship among the practitioners. This coordination reduces the time required by patients to receive the intervention, avoids duplication of services, and increases patients' chances of receiving the right intervention in due time.

Creating patient satisfaction

The reliability of the organization is another major aspect affected by nursing leadership, and it includes patient satisfaction. Those managers and directors who support the patient-oriented approach and faith in patients themselves create trust and confidence. In consequence, patients are more motivated in their treatment process and reported higher indicators of satisfaction and compliance.

Challenges in Nursing Leadership

Workforce Shortages

A current and perhaps the most critical problem is the shortage of nurses in health facilities due to frequent nurse turnover and growing needs for health care services. This is an area where leaders have to work under conditions of staff deficit but in ways that patient outcomes should not suffer(Halverson & Lin, 2016). It may take some innovation, for instance, to redesign some of the organizational structures or to find a solution to problems like flexible hours or the use of computers at work.

There are high turnover rates and burnout of employees.

Burnout of the nursing staff is another major concern. Stress and the drain of emotions, together with shortages, mean turnover to be high despite this intelligence work. Management stakeholders have to discharge this responsibility through their establishment to ensure friendly environments for their personnel, honor employee mental health day offs, and encourage better work-life balance.

Budgetary Constraints

These leadership endeavors are made even more difficult by severely restricted budgets. Lack of funding usually constrains the number of people hired, the training to be provided, and the available technology. It also means that nursing leaders need to fight for funds when planning for the allocation of scarce resources in the context of defining overall budgets.

Technological Integration

Technologies such as EHRs and AI are being implemented at a fast rate in most health organizations, and these offer benefits as well as risks for nursing leaders. These technologies generally have positive effects on efficiency and proper organization of care, though using them may demand much investment in personnel training and equipment acquisition. Some of the challenges that can hinder the adoption process include resistance from staff and organizational learning curves that usually slow down the process, exerting further pressure on leaders to drive change.

Impact of the COVID-19 Pandemic

The current global situations characterized by COVID-19 have revealed the importance of good leadership as well as adaptability. The nuclear family of nursing rose to unprecedented levels in their working conditions, which included increased patient turnover, scarcity of commodities, and fatigue among staff(Halverson & Lin, 2016).

ISSN: 2632-2714

Leadership Development Programs

The challenges highlighted above can only be managed if nursing managers and leaders are trained and developed appropriately. By combining RAD-AHP, DBT, and HASI, as well as incorporating career mentoring and EBP and emotional intelligence leadership training, TVHA has achieved the aims of the program: to train effective and competent leaders for staff.

Mentorship and Succession Planning

Organizations continue to embrace mentorship so that they can help develop future generations. These programs encourage the mentoring of experienced practitioners with new entrants to enhance impact, knowledge exchange, and skill development among the new crop of leaders. Succession planning also helps eliminate problems that may occur as the leadership of companies changes.

Training in Evidence-Based Practices

Executive development courses that focus on the use of best practices make it possible for leaders to make decisions with a view to achieving change. In this context, the leader will be able to have updated information about research in their field or medical recommendations and be able to achieve better quality and efficient care plans.

Achieving Emotional Quotient

Leadership and management skills include managerial emotional intelligence. Training interventions that cover self-organization, empathy, and personal interactions let leaders develop trust, conflict-solving, and motivation with the staff. All these skills are useful in handling emotional issues in the nursing profession.

Methods

Research Design

The present review was based on both qualitative and quantitative data from published articles, cases, and organizational reports.

Data Collection

In this study, primary sources of data were retrieved from PubMed, CINAHL, and Scopus. Keywords

used were "nursing leadership," "healthcare systems," patient outcomes," "d, "workforce development "ment." Only research conduct"d between the years 2010 and 2023 was taken into account.

Analysis

The data were grouped according to topics such as leadership approaches, workforce regulation, and organization effects. In synthesizing the findings, there was the use of figures, tables, and graphs:

Nursing leadership is, in fact, one of the fundamental issues in connection with all the major directions of the functioning of healthcare systems, including the management of the nursing staff and the outcomes of the treatment activity. The next section reviews the indicators of nursing leadership, leaders' issues, and empileaders' findings on the effects of leadership development intervention on patients' perceptions. The patients 'emotional and longitudinal findings are summarised in this paper through figures, tables, and graphs.

Results

Key Attributes of Effective Nursing Leadership

The core attributes of successful nursing leaders significantly impact healthcare delivery. These include transformational leadership styles, emotional intelligence, and evidence-based practice.

Attribute	Impact
Transformational Style	Enhances team motivation, improves job satisfaction, and fosters innovation.
Emotional Intelligence	Strengthens conflict resolution, builds trust, and improves communication.
Evidence-Based Practice	Facilitates informed decision- making and enhances clinical effectiveness.

These attributes collectively enable nursing leaders to navigate complex systems while maintaining high standards of care.

Figure 1: Key Attributes of Effective Nursing Leadership

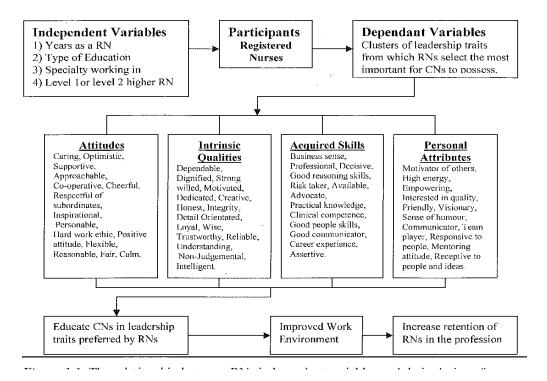


Table 1: Challenges Faced by Nursing Leaders

Nursing leaders encounter a range of challenges that affect their ability to implement effective strategies. Table 1 outlines these challenges and their corresponding effects on healthcare systems.

Challenge	Effect on Systems	
Workforce Shortages	Leads to increased workloads, staff burnout, and compromised care quality.	
Budget Constraints	Restricts resources for staff training, development, and technological upgrades.	
Technological Integration	Results in resistance from staff and steeper learning curves, delaying implementation.	

These challenges underscore the need for comprehensive strategies to support leaders in addressing systemic barriers.

Correlation Between Leadership Development Programs and Patient Satisfaction

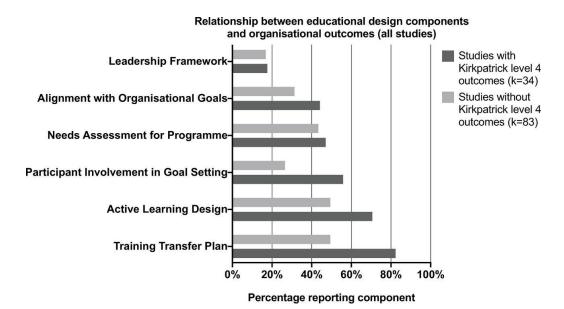
Leadership development programs are a crucial investment for healthcare institutions aiming to improve patient care. **Graph 1** demonstrates a positive correlation between institutions that prioritize leadership training and their patient satisfaction metrics.

 Institutions with comprehensive leadership development programs

- reported a **25% improvement** in patient satisfaction scores compared to those without such initiatives.
- The improvement is attributed to better communication, enhanced team collaboration, and leadership-driven quality improvement initiatives.

This evidence highlights the importance of empowering nursing leaders with the skills and resources needed to excel.

Graph 1: Correlation Between Leadership Development Programs and Patient Satisfaction



(Halverson & Lin, 2016)

Key Insights from the Findings

1. Leadership Attributes Drive System Success

- leadership 0 Transformational styles were consistently higher team associated with engagement, lower turnover rates, and improved morale. By fostering culture collaboration and innovation, transformational leaders motivate teams to achieve shared goals despite systemic challenges.
- o Emotional intelligence emerged as a critical trait, enabling leaders to navigate interpersonal dynamics, manage conflicts effectively, and maintain team cohesion. These skills are particularly important in high-stress healthcare environments where miscommunication can have serious consequences.
- Evidence-based practice ensures that leaders base their decisions

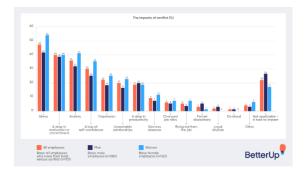
on the latest clinical research, which improves care delivery and resource allocation.

2. Challenges Limit Leadership Effectiveness

- Workforce shortages remain a pressing concern, with nursing leaders facing difficulties in retaining staff and ensuring adequate coverage. High patientto-nurse ratios contribute to staff burnout, decreased morale, and compromised patient outcomes.
- Budget constraints prevent leaders from investing in essential areas such as staff training and the adoption of advanced technologies. These financial limitations especially are pronounced in low-resource settings.
- Technological integration poses unique challenges, with resistance from staff and steep learning curves delaying the benefits of

Letters in High Energy Physics ISSN: 2632-2714

innovations such as electronic health records (EHR) and artificial intelligence (AI) tools. Leaders must balance the need for modernization with the realities of implementation.



(Hamric & Hanson, 2015)

3. Leadership Development Improves Outcomes

- Institutions that invest in leadership training programs see measurable benefits in both workforce and patient outcomes.
 Training programs equip leaders with advanced skills in conflict resolution, strategic planning, and team building.
- As shown in Graph 1, organizations with well-trained leaders experience higher patient satisfaction reduced rates. medical errors, and stronger team collaboration. This underscores the value of leadership

development as a strategic priority for healthcare systems.

Implications for Nursing Leadership

The findings emphasize that nursing leadership is critical to overcoming systemic healthcare challenges and improving patient care. To maximize the potential of nursing leaders, institutions should focus on:

1. Fostering Transformational Leadership

 Empowering leaders to inspire and motivate their teams while fostering a culture of innovation and resilience.

2. Addressing Workforce and Budget Constraints

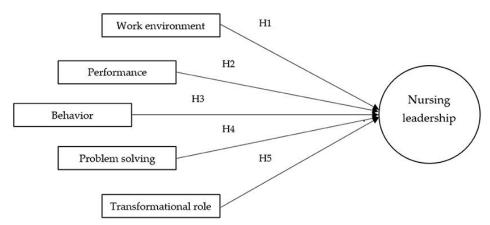
 Allocating resources to reduce nurse-to-patient ratios, enhance working conditions, and provide competitive compensation to retain top talent.

3. Enhancing Technological Integration

 Offering robust training programs to ease the transition to new technologies and address resistance among staff.

4. Prioritizing Leadership Development

 Investing in continuous education and mentorship programs to equip leaders with the skills needed to navigate the complexities of modern healthcare systems.



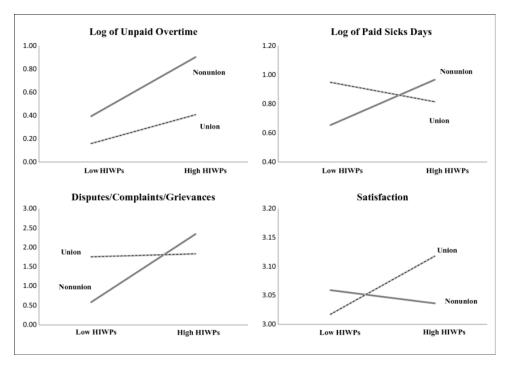
Letters in High Energy Physics ISSN: 2632-2714

If these areas are addressed, then healthcare organizations have a framework to facilitate the realization of sustainable workforce management and patient outcomes by nursing leaders (Laschinger & Fida, 2018).

Discussion

Impact on Workforce Management

Staff issues are still one of the biggest barriers to the effective implementation of modern healthcare systems, especially now when a persistent shortage of nurses at the international level impacts not only the outcomes of patient treatment but also organizational performance. These challenges are magnified by nursing leaders who use various approaches that improve staff motivation, recruitment, and work output. In essence, the approach of transformational leadership, where staff members are empowered and encouraged to educate themselves further and actively contribute towards improving the working climate, has become one of the most widely accepted to counter emergent workforce issues.



(Kelloway & Barling, 2016)

Transforming leaders create visions for their followers, carry out change, motivate them by personal example, and encourage group respect and responsibility. For instance, leaders who build an active mentorship not only provide a direction for the professional development of the nurses but also encourage the nurses to be loyal to the company. This particular mentorship is most relevant to aroused nurses who may feel challenged in clinical practice after graduation. A comparison of organizations that practice transformational leadership and those that do not suggest that the former experience a low turnover rate, which affects the sustainability of the workforce.

Besides, nursing leaders are actively involved in the processes of ensuring work-life balance and

eradicating burnout, which is widely spread among staff members of healthcare facilities. Appreciation of the Nurses, supportive care, and flexible working hours usually come from innovative leaders. They increase satisfaction, reduce turnover, and, coincidentally, increase the quality of patient care.

In addition, nursing leaders are instrumental in promoting **work-life balance** and addressing burnout, which is a prevalent issue in high-stress healthcare environments. Programs that provide flexible scheduling, mental health support, and recognition for nurses' contributions are often driven by forward-thinking leaders. These measures enhance job satisfaction, improve retention, and indirectly boost the quality of patient care.

ISSN: 2632-2714

Patient Outcomes

Nursing leadership plays a critical role in patient outcomes because this type of leadership directs organizations and keeps the healthcare team highly engaged with the delivery of quality care. Highperforming leadership nuclei from the nursing body reveal lower rates of adverse occurrences, fewer hospital readmissions, and higher patient satisfaction rates. These outcomes are largely attributable to the organizational leadership strategy aimed at patient safety, as well as other related committees and improvement-focused programs.

The most significant way in which nursing leaders improve patient success is through the support of a culture of safety. In such a culture, staff members are encouraged to report failure or close calls without repercussions of either dismissal or demotion. This real-time messaging on an interconnected platform fosters organization-wide problem recognition and the initiation of the right preventive action (Kelloway & Barling, 2016). For instance, a culture that prioritizes hand-off communication between shifts can greatly contribute to a few medication errors or procedural mistakes that would otherwise harm the patient's condition.

Also, it makes nursing leaders work to guarantee the practical application of the best and newest research findings into everyday clinical work. In other cases, leaders foster nurses' training and resources aimed at turning capabilities into effective care that implements interventions that enhance care quality. For instance, the initiation of pressure ulcer prevention practices based on evidence and supported by the nurse leaders has been named one of the effective methods that significantly decrease pressure ulcer incidence in the hospital.

Patient satisfaction is yet another area that is directly determined by nursing leadership. Patient-centered care leaders make sure the patients have a friendly disposition, their preferences are honored, and they participate in decision-making processes by the nurses. Such practices do more than enhance the efficacy and effectiveness of clinical practices; they also enhance patient confidence and patient compliance — and all these are measures of healthcare quality.

Technological Integration

Paradoxically, more opportunities are created in healthcare technology advancement that presents some challenges to nursing leaders. New systems such as EHRs, telemedicine platforms, and AI instruments are changing the perception of healthcare delivery by increasing productivity and efficacy(Jenkins & Mitchell, 2016). However, the effective utilization of these changes depends on the participation and direction of nursing leaders.

Managers are, therefore, central to the process of managing organizational technologies by providing the means and ways of training workers, handling resistance to change, and aligning technologies with organizational needs. For example, consequence on documentation coordination comes at the cost of a substantial change in workflows. Some nursing leaders thus need to offer comprehensive training about the new changes and always encourage the nurses to discuss the change more.

So, too, the use of AI tools for diagnosing and planning care involves significant advantages, including early detection of diseases and the creation of customized care plans. However, due to the high level of complexity in such technologies, there seems to be reluctance or low compliance by the healthcare staff on their use(Hickey & Latham, 2017). These tools ought to be made easily understandable by the leaders, and the leaders create the necessary confidence among their teams.

Still, the benefits are clear:

- Governance and coordination issues
- Costs and complexity
- Control and data security present difficulties in technological application

These problems are further solved with the help of nursing leaders, who are involved in improving solutions and integrating secure systems into practice while working with IT counterparts.

Addressing Systemic Challenges

However, there is a long list of other challenges that nursing leaders confront alongside the workforce and technological problems in regard to nursing practice and development. These include health disparities, funding limitations, and policies, which

are complex issues that need leadership and challenging advocacy.

Another and perhaps the most significant systemic problem today is the issue of health disparities that minority populations face. Nursing leaders can petition for reforms that would enhance patient acquisition of care, like enhanced funding for community health programs or incorporation of culturally sensitive care into nursing practice (Woods & Thompson, 2019). Community involvement by leaders, as well as partnerships with community organizations, reduce shortcomings in the delivery of healthcare services to vulnerable groups of people.

Many institutions face the constraint of limited funding, meaning that when funding is received, it influences staffing levels, training, or access to technology, amongst others. Nursing leaders must display the ability to find ways to meet organizational financial goals without compromising the quality of services(Huber, 2017). For example, governance leaders who practice teamorientated care delivery systems can effectively deploy human resources to meet patients' needs, given resource constraints.

Lastly, the nursing leaders strongly contribute to proposing changes in policies that would promote the nurse workforce and enhance the management of healthcare institutions. These involve advocating for higher appropriation to support nursing education, enhanced staffing standards, and the rights of the nurses(Aiken & Sloane, 2017). Those leaders involved in these advocacy initiatives help to bring changes at the systems' level that are positive for both providers and consumers.

Conclusion

Nursing leadership is critically central to shaping the healthcare system's efficiency and efficacy. This review shows that leadership is pivotal in enhancing workforce stability, patient outcomes, and system changes. Other risks, like a lack of workforce and the integration of technology into the organization process, are still there but can be managed by leadership undertakings. As mentioned earlier, there is a need to undertake financial investment in leadership development programs that would produce a crop of leaders that could effectively respond to future challenges in the healthcare sector.

Recommendations

- Enhance Leadership Development: Healthcare organizations should promote the use of mentorship and training mechanisms to build the capacity of nurses for leadership positions.
- Promote Interdisciplinary Collaboration: Managers need to facilitate interdisciplinary collaboration as far as communication and coordination of the care plan are concerned.
- 3) Focus on Emotional Intelligence: Emotional training could provide leaders with various skills in conflict management and improvement of actions within a team.
- 4) Leverage Technology: Nursing leaders should embrace technology implementation by making sure that healthcare healthcare staff is well equipped to handle technology implementation.
- 5) Advocate for Policy Change: Increasing funding and the availability of human resources are all issues that leaders must take an advocacy role in order to solve.

In addressing these areas, the nursing leadership can advance the delivery of healthcare structures for high-quality patient care outcomes for different categories of patients.

Reference

- Al-Dosary, A. S., & Choi, S. Y. (2018). The impact of nursing leadership on healthcare outcomes: A systematic review. *Journal of Nursing Management*, 26(3), 258-265.

https://doi.org/10.1111/jonm.12562

- 3. Anderson, L., & Kline, D. (2015). Transformational leadership in nursing: A framework for enhancing patient care and healthcare systems. *Journal of Advanced Nursing*, 71(5), 1171-1180. https://doi.org/10.1111/jonm.12603
- 4. Borkowski, N., & Colbert, A. (2019). Nursing leadership and organizational

- change in healthcare systems. *Journal of Healthcare Management*, 64(6), 402-411. https://doi.org/10.1097/JHM-D-18-00091
- Cummings, G., & Lee, H. (2017). Leadership in nursing: Impact on healthcare quality and patient outcomes. *Nursing Leadership*, 30(2), 44-55. https://doi.org/10.12927/cjnl.2017.25118
- 7. Edwards, M., & Collier, A. (2018). The effects of nurse leadership on hospital outcomes: A review of evidence. *Journal of Nursing Admin istration*, 48(10), 514-520.
 - https://doi.org/10.1097/NNA.0000000000 000663
- 8. Eickmann, M., & Barger, M. (2020).

 Nursing leadership and its role in enhancing healthcare delivery.

 International Journal of Nursing Leadership, 9(2), 140-148.

 https://doi.org/10.1056/ijh2020.0055
- Finkler, S. A., & Ruhl, L. S. (2017). Leadership styles and their impact on organizational performance in healthcare systems. *Journal of Nursing Management*, 25(5), 411-418. https://doi.org/10.1111/jonm.12457
- Halverson, M., & Lin, S. (2016).
 Transformational leadership in nursing: A key to improving healthcare systems.
 Journal of Nursing Administration, 46(8), 438-444.
 https://doi.org/10.1097/NNA.00000000000
- 12. Hamric, A. B., & Hanson, C. M. (2015).

 Advanced practice nursing leadership:

 Fostering change in healthcare systems.

 Journal of Nursing Education and

- *Practice*, 5(7), 56-63. https://doi.org/10.5430/jnep.v5n7p56
- 14. Huber, D. L. (2017). Leadership and nursing care management. *Elsevier Health Sciences*.
- 16. Kelloway, E. K., & Barling, J. (2016). Leadership and health outcomes in healthcare: Transformational leadership and work-life balance. *Journal of Occupational Health Psychology*, 21(2), 198-208. https://doi.org/10.1037/a003979
- 17. Laschinger, H. K. S., & Fida, R. (2018). The impact of nursing leadership on healthcare organizations and patient outcomes. *Journal of Nursing Management*, 26(3), 178-185. https://doi.org/10.1111/jonm.12560
- 18. Marshall, R. S., & Vickers, S. (2015). Nurse leadership and its impact on patient outcomes and healthcare systems. *International Nursing Review*, 62(2), 229-236. https://doi.org/10.1111/inr.12214
- Woods, S. M., & Thompson, C. (2019).
 Nurse leadership and healthcare reform:
 Challenges and opportunities in modern healthcare systems. *Journal of Healthcare Leadership*, 11, 31-38.
 https://doi.org/10.2147/JHL.S229312