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Original Article

Exploring the Impact of Nurse Leadership Styles on Quality of Work Life and Efficiency in Shiraz Hospitals, Iran, 2024

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Abstract

Introduction: To examine the impact of nurse leadership styles on the Quality of work life (QWL) and Efficiency at Shiraz University Hospitals.

Methods: In this cross-sectional study, 40 head nurses and 180 nurses from 20 inpatient wards were surveyed. Data were collected using Walton's standard QWL questionnaire, the Hersey-Blanchard leadership style questionnaire, and Data Envelopment Analysis (DEA).

Results: Transformational leadership (45%) was the most common style associated with higher QWL and Efficiency. Regression analysis showed that transformational leadership had a significant positive effect on QWL (B=0.45, P<0.001) and Efficiency (B=0.38, P<0.001). Laissez-faire leadership was associated with lower QWL and efficiency scores. Path analysis confirmed the mediating Role of QWL in the impact of transformational leadership on Efficiency. ANOVA and post-hoc tests further validated that transformational leadership significantly outperforms all other styles regarding Efficiency. Transactional leadership also showed a moderate positive effect on Efficiency (P=0.03), but its impact on QWL was not statistically significant.

Conclusion: Transformational leadership improves QWL and Efficiency in hospitals. Training in transformational leadership is recommended for head nurses to enhance staff well-being and operational performance. The study's limitations include its cross-sectional design, reliance on self-reported data, and potential lack of generalizability beyond Shiraz University Hospitals. Further research is suggested to explore the long-term impacts of leadership styles. It includes patient outcomes and care quality metrics to understand leadership effectiveness in healthcare settings better.

Keywords: Leadership styles, quality of work life, QWL, Hospital efficiency, Inpatient ward performance

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Introduction

Leadership is essential to organizational success, particularly in healthcare settings where complex and dynamic challenges often occur (1-3). The constantly changing environment within healthcare requires nurse leaders to adopt appropriate leadership practices that enhance organizational results, increase job satisfaction, and improve the general Quality of work life among the healthcare staff (2, 4-6). The present study explores the leadership styles of head nurses at Shiraz University Hospitals and their relationship with the Quality of work life and the Efficiency of some selected inpatient departments.

The Role of leadership in setting apart successful organizations from their unsuccessful counterparts is significant (7, 8). Effective leadership has been cited as a primary key to achieving high performance in healthcare systems (9). Hersey and Blanchard argue that effective human resource management, based on the behavioral sciences, is crucial to organizational success (10, 11). This assertion justifies the need for nursing managers to exercise flexible and adaptive leadership styles because of the complex issues faced by modern healthcare environments.

Quality of work life (QWL) is increasingly recognized as a key determinant in empowering

healthcare employees (12, 13). The concept is multidimensional, encompassing aspects such as physical and psychological well-being, job satisfaction, and fulfillment of the needs of employees within their work environment (14-16). Improving QWL is vital for the retention of health professionals and for the sustainability of healthcare systems. Research has shown that a high quality of work life is associated with productivity and organizational commitment, which ultimately impacts the outcome of healthcare services (12, 17, 18).

In addition, the efficiency aspect in healthcare-related institutions has drawnsignificantattention from researchers. Efficiency is usually gauged based on several indicators, such as ratios of the staff to beds, bed occupancy rates, and availability of medical equipment. These indicators are vital for judging hospital performance (12, 17-19). The effective utilization of available resources to maximize output has emerged as a key strategy to improve organizational Efficiency (20-23). Therefore, understanding the interrelationships between leadership styles, QWL, and departmental Efficiency is crucial for enhancing healthcare delivery.

Despite the growing body of literature on healthcare leadership, limited research has simultaneously examined the impact of head nurses' leadership styles on the Quality of work life and departmental Efficiency. This gap indicates a need for a comprehensive study that could inform hospital administrators about the selection and training of nurse leaders. A more complete understanding of the impact of different leadership styles on the employees' well-being and operational effectiveness can help create more effective management strategies and improve patient care outcomes (24-26).

Various leadership styles have been identified in the literature, each with different implications for employee engagement and organizational effectiveness. Transformational leadership, for instance, focuses on motivating and inspiring employees to achieve higher performance levels through a shared vision and empowerment. In contrast, transactional leadership focuses on clearly defined tasks and rewards, which may not be enough to satisfy the internal needs of employees (27, 28). Balancing these different leadership styles is important for creating a supportive work environment that fosters higher job satisfaction and productivity (4, 26).

The significance of different leadership styles relates to their impact on organizational culture and employee morale. Competent leaders create environments where employees feel valued and are motivated to contribute actively toward realizing organizational goals (29-31). This is particularly important in nursing, where the work's emotional and psychological stress may significantly affect employee retention and performance (32, 33). Effective leadership will help nurse leaders enhance the Quality of patient care and, at the same time, ensure a sustainable workforce (34-36).

In addition, the World Health Organization has emphasized the Role of leadership in health systems, referring to it as a crucial factor in achieving health-related goals (37). The organization's definition of Quality of life includes individual assessments of well-being and the broader social environment in which people live and work. Such a multidimensional view of the Quality of life underlines the need for healthcare leaders to adopt comprehensive approaches that address the diverse needs of their staff members (38-40).

In summary, this research fills the gap in the existing literature by exploring the interaction between leadership styles, Quality of work life, and Efficiency in the inpatient departments of Shiraz University Hospitals. The results of this study are derived from a broad methodological framework, thereby providing important insights for healthcare administrators and policymakers. The implications of this study go beyond the local setting, contributing towards a greater understanding of effective leadership practices within healthcare organizations worldwide. Finally, improving the effectiveness of leaders can result in better organizational performance, higher quality care, and healthier patients.

Thisstudyaimedtocontributetothetheoretical discourse on leadership in the healthcare sector while offering concrete recommendations applicable to diverse healthcare contexts. By developing practical approaches to leadership, healthcare organizations can foster the well-being of their workforce and the populations they serve, promoting the development of a resilient and adaptive healthcare system.

Theoretical Framework

Leadership Styles: Introduction and Examination of Various Leadership Approaches

Leadership is critical in forming the culture

and effectiveness of an organization, especially in healthcare (41-43). Over the years, several styles have been identified, each with differing effects on employees' motivation, job satisfaction, and performance levels. Some best-known styles include transformational, transactional, autocratic, democratic, and laissez-faire leadership (44, 45).

Transformational leadership involves inspiring and motivating employees to subordinate their interests to the organization's. It involves a clear vision, good communication, and the creation of an inclusive environment where team members feel valued and empowered. According to Bass and Riggio (46), transformational leaders build trust and create a sense of teamwork—all very crucial elements, especially in high-stress work environments like hospitals (47, 48).

On the other hand, transactional leadership focuses on clear tasks and reward systems. Leaders using this style often set clear expectations and rewards for meeting specified performance goals. This approach may bring quick improvements in productivity. However, it may never fully satisfy employees' deeper emotional and psychological needs, especially in healthcare, where morale plays a significant role in patient care (49-51).

In autocratic leadership, the leader makes all the decisions and completely controls the team. Such a practice ensures fast decisions are made, but creativity and teamwork are limited; therefore, employee job satisfaction is very low (52-55). Democratic leadership allows participation and input from the team members; this gives a feeling of ownership and commitment to organizational goals (56-58).

Laissez-faire leadership represents a non-interventionist approach wherein leaders provide minimal direction, granting employees substantial autonomy in decision-making processes. This style emphasizes freedom and independence, which was introduced by scholars such as Lewin, Lippitt, and White. Key dimensions encompass trust, delegation, and the equilibrium between guidance and autonomy within team dynamics. While potentially beneficial for highly skilled personnel, this approach may engender confusion and insufficient guidance in intricate settings like healthcare. Ultimately, the efficacy of laissez-faire leadership is contingent upon the specific context and the unique requirements of the organization and its workforce (54, 59).

Quality of Work Life: Concept and its Importance in Hospital Settings

Quality of work life (QWL) refers to an individual's overall perception of their work environment, influenced by factors like job satisfaction, work-life balance, and mental well-being. This is an important concept in healthcare because a good QWL retains skilled professionals vital in providing high-quality patient care. High QWL is associated with lower turnover rates, increased job satisfaction, and heightened organizational commitment.

QWL is a very important factor in a hospital. Many studies have claimed that the work environment influences employees' morale and productivity, thus, in turn, affecting patients positively. For example, Blegen et al. argued that with better job satisfaction on the part of the nurse, there was better satisfaction from the patient as well, with fewer clinical incidences (60).

The World Health Organizationoutlinesthatthe healthcare workforce must be satisfied, motivated, and competent to provide quality care and have an efficient healthcare system (12). QWL depends on organizational factors, including leadership styles, organizational culture, and availability of resources. Supportive leaders prioritize QWL in the workplace, creating supportive environments for their employees that increase retention and quality patient care (12, 61).

Efficiency of Hospitals: Evaluation Criteria and Significance

The Efficiency of a hospital is a critical metric that undertakes organizational performance and reflects the ability to deliver quality care while optimizing resource utilization (62, 63). It is commonly assessed using various indicators, such as bed occupancy rates, staff-to-patient ratios, and availability of medical equipment. These metrics provide insight into how effectively a hospital operates and its capacity to meet patient needs (64-66).

This means that the more efficient the hospital, the more timely and effective the care provided, translating to better patient outcomes. Efficiency affects not only the level of care provided but also the economic perspective in terms of increased costs and waste created by inefficient operations (67, 68). It is essential to comprehend the associations between leadership, Quality of work

life (QWL), and hospital efficiency to enhance healthcare delivery.

The study by Aiken et al. (2011) indicated that nurse staffing levels were linked to patient outcomes and that adequate resource management is vital. Furthermore, leadership styles that promote teamwork and allow employee participation can improve Efficiency since satisfied and motivated staff are easier to cooperate with and more willing to make optimum contributions (69).

Leadership Styles, Quality of Work Life, and Hospital Efficiency: Putting it All Together

Leadership style, Quality of work life, and hospital efficiency are interrelatedly complex and important for organizational success within the healthcare framework. Effective leadership styles directly affect QWL, employee performance, and organizational Efficiency. Transformational and democratic leaders are likelier to assure a favorable work environment and QWL, thereby improving efficiency (4, 70-73).

In contrast, managerial approaches disregarding employees' needs or fostering a hostile workplace result in lower job satisfaction and increased turnover, ultimately at the expense of hospital efficiency. The challenge for healthcare administrators is recognizing and implementing leadership strategies that support employee well-being and organizational goals (74-77).

In this regard, the current literature review has pointed to the Importance of understanding how different leadership styles, Quality of work life, and hospital efficiency interact reciprocally in Shiraz University Hospitals. These insights will enable healthcare leaders to make more conscious decisions that enhance employee satisfaction and operational effectiveness. This study represents an effort to add to the literature by determining how the leadership styles of head nurses impact the Quality of work life and Efficiency, aiming to improve patient care outcomes and increase organizational sustainability.

Methods

A. Study Design

This study uses a cross-sectional survey methodology to explore the relationship between leadership styles demonstrated by head nurses in Shiraz University Hospitals and their effects on the Quality of work life and operational Efficiency in selected inpatient wards. A cross-sectional design is suitable for the present study because it allows data collection at one point, thus providing a snapshot of the prevailing conditions regarding leadership styles, Quality of work life, and operational efficiency among the hospital wards under study (Figure 1) (78).

B. Sampling Strategy: Study Population

The study population comprises head nurses, their first deputies from selected inpatient

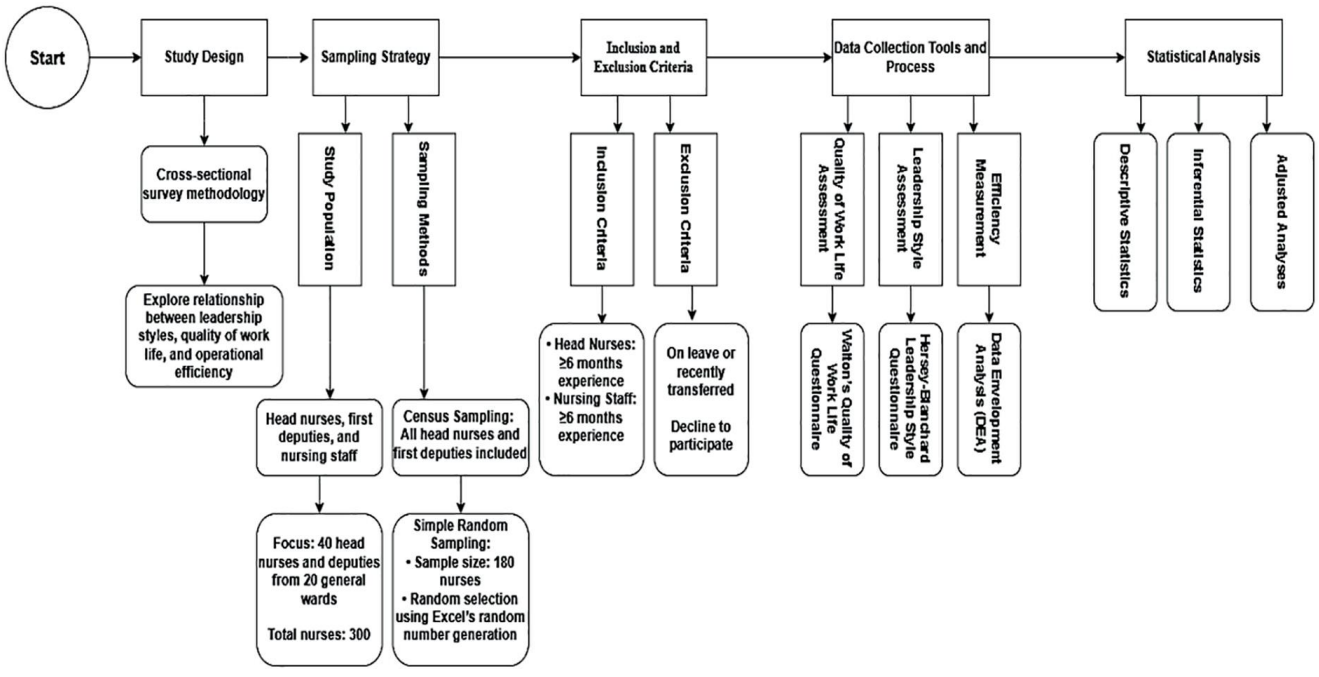

Figure 1: Research Methodology Flowchart

wards, and the nursing staff under their supervision. Specifically, the research focuses on 40 head nurses and their deputies from 20 general wards, including internal medicine, general surgery, pediatrics, and gynecology, within Shiraz University Hospitals. The total population of nurses in these selected wards is 300. The study incorporates a sample of 40 head nurses and their deputies across 20 general wards, including clinical departments such as internal medicine and pediatrics, within Shiraz University Hospitals. This selection ensures a diverse representation of leadership styles in healthcare settings. The sample, drawn from a total population of 300 nurses, balances statistical robustness and practical feasibility for data collection. By encompassing multiple wards, the research design captures variations in leadership practices and their subsequent effects on Quality of work life (QWL) and operational Efficiency. The adequacy of the sample size is validated using Cochran's formula (79), a methodological approach that aligns with established statistical principles to ensure sufficient power for detecting meaningful associations between leadership dynamics and healthcare delivery outcomes. This systematic sampling strategy enhances the generalizability of findings while maintaining methodological rigor.

Sampling Methods

Census Sampling

Given the manageable number of head nurses (40), a census sampling method was used. This means all head nurses and their first deputies in the selected wards were included in the study.

Simple Random Sampling

A simple random sampling method was employed to select the nursing staff participants. Using Cochran's formula, which is expressed as:

$$n0 = \frac{Z^2 \cdot p \cdot (1-p)}{e^2}$$

Where:

• n0=desired sample size,

• Z=Z-value for the desired confidence level (e.g., 1.96 for 95% confidence),

• P=estimated proportion of the population (often set at 0.5 for maximum variability),

• e=margin of error (e.g., 0.05).

A total sample size of 180 nurses was determined and distributed among 20 wards. The sample size for each ward was calculated based on the proportion of nurses in each ward relative to the total population of 300 nurses. For instance, if a ward had 15 nurses, it would have a sample size of:

$$Sample\ Size\ for\ Ward\left(\frac{Number\ of\ Nurses\ in\ Ward}{Total\ Nurses}\right) \times 180$$

This ensures representation from each ward according to their size. Simple random sampling was implemented by compiling a complete list of nurses in the selected inpatient wards and assigning unique identification numbers to each nurse. Using Excel random number generation, we randomly selected 180 IDs. This method ensured that each nurse had an equal chance of selection, providing a representative and unbiased sample. This approach improves the study's validity and guarantees that the results can be applied to the broader nursing population in the hospital.

Inclusion and Exclusion Criteria

Inclusion Criteria

• **Head Nurses:** at least six months of experience in their Role within the inpatient wards of the selected hospitals and willing to participate in the study by completing the leadership style questionnaire.

• **Nursing Staff:** A minimum of six months of work experience in the specific ward at the time of the study and willingness to participate in the research.

Exclusion Criteria

• Any participants on leave or recently transferred to other departments during the data collection period.

• Participants who do not provide informed consent to participate in the study.

C. Data Collection Tools and Process

C-1. Quality of Work Life Assessment: To evaluate the Quality of work life among nurses, we used Walton's Quality of Work Life Questionnaire (80). This well-validated instrument measures multiple dimensions of work-life Quality, including fair and adequate payment, safe and healthy working conditions, opportunities for growth and continuous security, adherence to organizational lawfulness, the social relevance of work life, overall life space, social integration, and the development of human capabilities. The

questionnaire consists of 32 items, each scored on a Likert scale ranging from 1 (very low) to 5 (very high), with total scores ranging from 32 to 160. Scores will be categorized into three levels: low Quality of work life (32-64), moderate Quality of work life (64-96), and high Quality of work life (above 96) (80, 81). Walton's Quality of Work Life Questionnaire has been confirmed valid in an Iranian research study, attaining a Cronbach's alpha coefficient of 0.90, demonstrating strong internal consistency and reliability. This well-established instrument covers various dimensions of work-life Quality, ensuring comprehensive evaluation in the healthcare context.

C-2. Leadership Style Assessment: The leadership styles of head nurses were assessed using the Hersey-Blanchard Leadership Style Questionnaire (10). This tool, developed by Hersey, Blanchard, and Newmayer in 1999, evaluates leadership behavior across four styles: directive, coaching, participative, and delegative. The questionnaire includes 12 scenarios, each with four possible responses corresponding to the four leadership styles. Participants select the response that best describes their typical behavior in each scenario (10, 82). The instrument has been previously validated in Iran, with a reported reliability coefficient of 0.92, ensuring its suitability for the current study context. The Hersey-Blanchard Leadership Style Questionnaire has demonstrated strong reliability, with a Cronbach's alpha coefficient of 0.92, as validated in previous studies conducted in Iran. This instrument effectively captures different leadership behaviors and styles, making it suitable for assessing the leadership dynamics within hospital settings.

C-3. Efficiency Measurement Efficiency: The Efficiency of the inpatient wards was measured using Data Envelopment Analysis (DEA), a non-parametric method in operations research and economics for estimating production frontiers. This method is widely used for assessing the Efficiency of decision-making units (DMUs), such as hospital wards (83). The DEA model selected for this study is the BCC (Banker, Charnes, and Cooper) output-oriented model. It is particularly suitable for healthcare settings due to its flexibility in handling variable returns to scale.

DEA was applied to assess the relative Efficiency of each ward by comparing multiple inputs (e.g., number of nurses, hospital beds, and occupied space) to outputs (e.g., number of treated patients, bed turnover, and number of consultations).

DEA Implementation Steps

1. **Model Definition:**
   - o Utilize the BCC output-oriented DEA model to assess the Efficiency of hospital sections.
   - o Define the inputs (active beds, physicians, nurses, and occupied space) and outputs (admitted patients, bed turnover, number of consultations).
2. **Data Collection:**
   - o Collect quantitative data from hospital records for all inputs and outputs.
3. **Weight Assignment:**
   - o Appropriate weights are assigned to the inputs and outputs based on expert judgment. This ensures that the relative Importance of each variable is accurately reflected in the efficiency analysis.
4. **Efficiency Score Calculation:**
   - o Efficiency scores will be calculated for each ward using Microsoft Excel, ranging from 0 (completely inefficient) to 1 (efficient).
5. **Results Interpretation:**
   - o Analyze the results to identify best-practice hospital sections and those that are underperforming.
   - o Use the efficiency scores to suggest areas for improvement, focusing on maximizing outputs while maintaining or reducing inputs.

D. Statistical Analysis

Descriptive and Inferential Statistics

Descriptive Statistics: Descriptive statistics was used to summarize the demographic characteristics of the study participants, including age, gender, years of experience, and educational background. Mean scores and standard deviations were calculated for key variables such as leadership style, quality of work life, and efficiency scores.

Inferential Statistics: The following analyses were performed to explore the relationships between the study variables:

- **Multiple Regression Analysis:** This analysis explores the relationships between leadership style (independent variable), quality of work life, and ward efficiency (dependent variables). Multiple regression helps identify the leadership styles most predictive of high work-life Quality and efficient ward operations.

• **Independent T-Tests and ANOVA:** These tests compare the mean Quality of work life and Efficiency scores across different leadership styles, demographic groups, and ward types. ANOVA is beneficial for comparing more than two groups.

• **Path Analysis:** Path analysis will be employed to understand the relationships between variables further. This technique allows the exploration of the direct and indirect effects of leadership styles on work-life Quality and Efficiency. Efficiency in nursing entails delivering ethical, high-quality care through optimized resource use, effective communication, technology integration, and adequate staffing. However, conflicting priorities—nurses emphasizing patient-centered care versus managers prioritizing cost reduction—create tension, risking workforce morale and care quality (84). By examining how leadership styles impact Efficiency, we aim to identify practices that enhance productivity and optimize patient care outcomes.

• **Subgroup Analyses:** Subgroup analyses examine the influence of specific factors such as age, gender, and work experience on the observed relationships. This will provide a more nuanced understanding of how these variables moderate or mediate the impact of leadership styles on the outcomes of interest.

Adjusted Analyses: To control for potential confounders, we employed adjusted analyses. Variables such as the size of the ward, patient demographics, and institutional characteristics were included in the multiple regression models to ensure that these factors do not confound the observed effects of leadership styles on work-life Quality and Efficiency.

E. Ethical Considerations

Before data collection, ethical approval was obtained from the Institutional Review Board (IRB) of the University of Medical Sciences. All participants were informed about the study objectives, procedures, potential risks, and benefits. Informed consent was obtained from each participant, ensuring their voluntary participation. Confidentiality and anonymity were strictly maintained throughout the research process. Participants were assured that their data would be used solely for research purposes and that they had the right to withdraw from the study at any point without any consequences.

By adhering to rigorous methodological standards, this study aimed to contribute to the growing body of knowledge on nursing leadership and its critical Role in enhancing the Quality of work life and operational Efficiency in healthcare environments.

Results

This section presents the study's findings, detailing the relationship between the leadership styles of head nurses in Shiraz University Hospitals and their impact on the Quality of work life (QWL) and departmental Efficiency. The results are organized into descriptive statistics, cross-tabulations of leadership styles with QWL and efficiency metrics, regression analysis, and path analysis.

1. Descriptive Statistics

The demographic characteristics of the participants are summarized in Tables 1, 2, and 3. The sample comprises 66.7% female and 33.3% male participants, with an average age of 38.5 years. Most participants fall within the 40-49 age group (30%) and have an average of 14.3 years of experience.

2. Leadership Styles and Their Distribution

Table 1*:* Demographic Characteristics of the Participants

Variable	Category	Frequency	Percentage
Gender	Female	120	66.7%
	Male	80	33.3%
Age (Mean±SD)		38.5±9.2	-
Years of Experience (Mean±SD)		14.3±7.8	-

Table 2: Age Distribution of the Participants

Age Group (Years)	Frequency	Percentage
20-29	30	15%
30-39	50	25%
40-49	60	30%
50-59	40	20%
60+	20	10%

Table 3: Years of Experience Distribution

Experience Group (Years)	Frequency	Percentage
0-4	40	20%
5-9	50	25%
10-14	40	20%
15-19	30	15%
20+	40	20%

Table 4: Distribution of Leadership Styles Among Head Nurses and Deputy Head Nurses

Leadership Style	Frequency	Percentage
Transformational	18	45%
Transactional	12	30%
Democratic	6	15%
Laissez-faire	4	10%

The distribution of leadership styles among head and deputy head nurses is presented in Table 4 (Figure 2).

Transformational leadership is the most prevalent style (45%), followed by transactional leadership (30%). Democratic and laissez-faire styles are less common, accounting for 15% and 10%, respectively.

3. Cross-tabulation of Leadership Styles with QWL and Efficiency

Table 5 cross-tabulates leadership styles with QWL scores, and Table 6 cross-tabulates leadership styles with hospital efficiency metrics (derived from DEA analysis).

The results indicate that transformational leadership is strongly associated with high QWL and hospital efficiency. In contrast, laissez-faire leadership is associated with lower QWL and efficiency scores.

4. Regression Analysis

A multiple regression analysis was conducted to examine the impact of leadership styles on QWL and Efficiency. The results are summarized in Table 7.

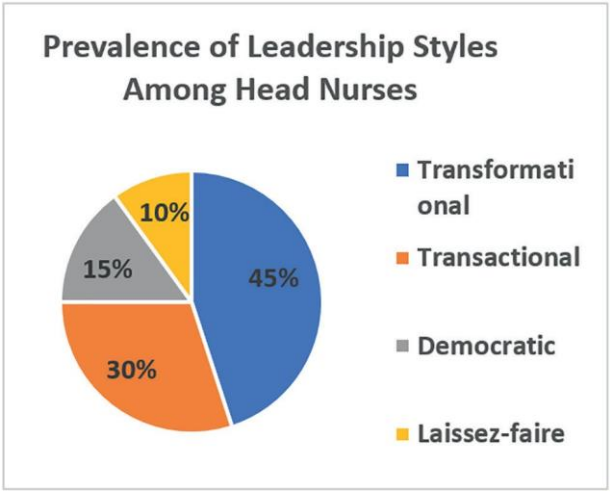

Figure 2: Prevalence of Leadership Styles Among Head Nurses

The regression results reveal that transformational leadership has a statistically significant positive effect on both QWL ($P<0.001$) and Efficiency ($P<0.001$), while laissez-faire leadership negatively affects both outcomes.

Table 5: Cross-tabulation of Leadership Styles and QWL Scores

Leadership Style	Low QWL	Moderate QWL	High QWL	Total	Percentage of Total
Transformational	0	6	12	18	45%
Transactional	3	8	1	12	30%
Democratic	2	3	1	6	15%
Laissez-faire	3	1	0	4	10%
Total	8	18	14	40	100%

Table 6: Cross-tabulation of Leadership Styles and Hospital Efficiency (DEA Scores)

Leadership Style	Low Efficiency (<0.65)	Moderate Efficiency (0.65-0.75)	High Efficiency	Total	Percentage of Total
Transformational	0	6	12	18	45%
Transactional	4	7	1	12	30%
Democratic	3	3	0	6	15%
Laissez-faire	4	0	0	4	10%
Total	11	16	13	40	100%

Table 7: Regression Results for Leadership Styles, QWL, and Efficiency

Predictor Variable	Dependent Variable	B (Coefficient)	SE (Standard Error)	P value	95% Confidence	R^2
Transformational	OWL	0.45	0.12	<0.001	[0.21, 0.69]	0.38
Transactional	QWL	0.15	0.10	0.12	[-0.04, 0.34]	0.12
Laissez-faire	QWL	-0.22	0.13	0.08	[-0.47, 0.03]	0.15
Transformational	Efficiency	0.38	0.09	<0.001	[0.20, 0.56]	0.42
Transactional	Efficiency	0.21	0.07	0.03	[0.02, 0.40]	0.25
Laissez-faire	Efficiency	-0.29	0.10	0.02	[-0.49, -0.09]	0.18

Transactional leadership shows a moderately positive effect on Efficiency (P=0.03), but its impact on QWL is not statistically significant.

5. Path Analysis

A path analysis was conducted through QWL to explore leadership styles' direct and indirect effects on Efficiency. The path diagram (Figure 1) illustrates these relationships.

Figure 1: Path Analysis of Leadership Styles Impact on Efficiency via QWL

- Transformational Leadership → QWL (β=0.45, P<0.001) → Efficiency (β=0.38, P<0.001)
- Transactional Leadership → QWL (β=0.15, P=0.12) → Efficiency (β=0.21, P=0.03)
- Laissez-faire Leadership → QWL (β=-0.22, P=0.08) → Efficiency (β=-0.29, P=0.02)

The path analysis indicates that transformational leadership has both a direct and an indirect positive effect on Efficiency, mediated by QWL. Laissez-faire leadership, on the other hand, negatively impacts both QWL and Efficiency (Figure 3).

6. Efficiency Analysis Using DEA

Hospital Department Efficiency Analysis Using DEA

This study employed Data Envelopment Analysis (DEA) with the BCC model to assess the Efficiency of different hospital departments. DEA is a non-parametric method used in operations research and economics to estimate production frontiers. It is widely used to evaluate the Efficiency of Decision-Making Units (DMUs), such as hospital departments. The BCC model allows for variable returns to scale, meaning that an increase in inputs does not necessarily lead to a proportional output increase.

The efficiency score in DEA is calculated as:

Efficiency = Weighted sum of outputs / Weighted sum of inputs

This study's inputs included the number of

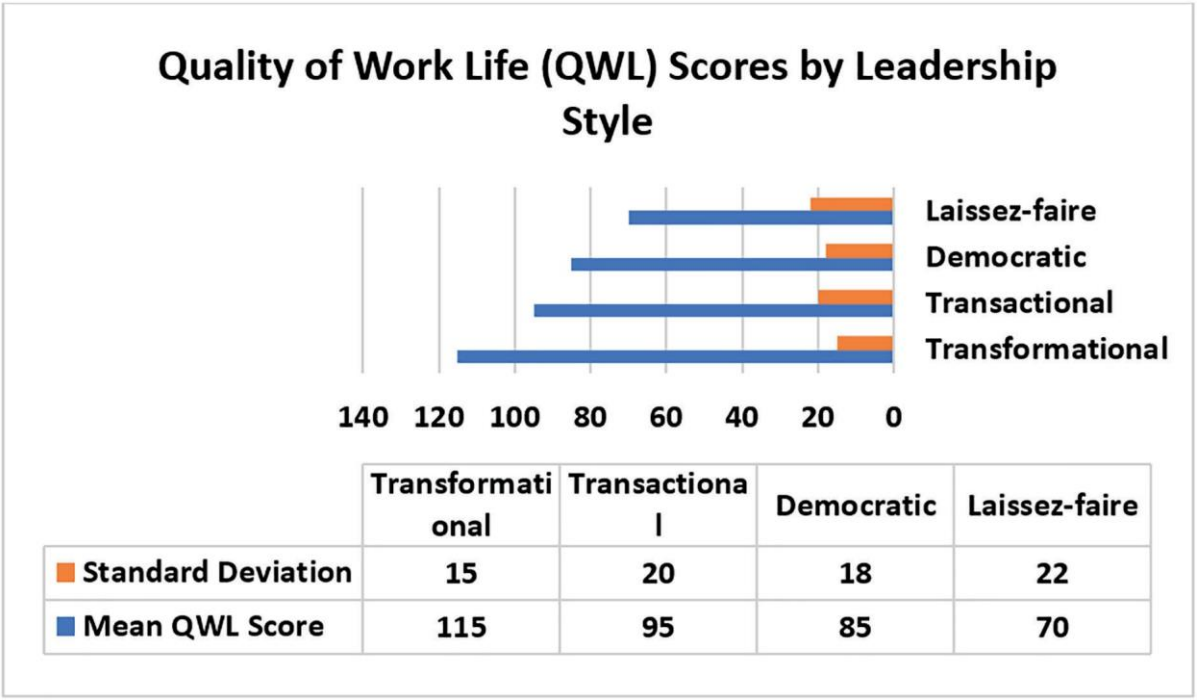

Figure 3: Quality of Work Life (QWL) Scores by Leadership Style

Table 8: Hospital Efficiency Scores Using DEA

Hospital	Average Efficiency	Inputs (Staff, Beds, Equipment)	Outputs (Patients Treated, Surgeries)
Hospital D	0.742	Optimal	High
Hospital C	0.733	Consistent	High
Hospital B	0.659	Moderate	Medium
Hospital A	0.657	Suboptimal	Low

active beds, physicians, nurses, and occupied space (m^2). At the same time, the outputs comprised the number of admitted patients, bed occupancy rate, bed turnover, number of consultations, and infection rate (%). The DEA model assigns weights to each input and output to Maximize the Efficiency of each DMU (in this case, each hospital department).

The results of the DEA analysis, as presented in the table, show that D1 is the most efficient department, with a score of 0.7745, while A1 is the least efficient one, with a score of 0.6428. Overall, departments D and C exhibit higher Efficiency than departments A and B. This difference in Efficiency could be attributed to factors such as resource management (e.g., staffing levels, bed occupancy) and performance (e.g., number of patients treated).

Based on the DEA results, less efficient departments can improve their performance by benchmarking against the practices of more efficient departments and optimizing their resource utilization (Table 8).

Hospitals D and C exhibited the highest Efficiency, attributed to optimal resource utilization (e.g., staffing levels, bed occupancy) and high patient throughput. Conversely, hospitals A and B showed lower Efficiency, primarily due to suboptimal resource management.

The input and output variables for DEA were selected based on a thorough review of relevant literature, ensuring that they appropriately reflect hospital wards' operational capacity and performance. Inputs included the number of staff, hospital beds, and availability of medical equipment, while outputs focused on patient-related outcomes such as the number of treated patients and surgeries performed.

7. Statistical Significance and Confidence Intervals

The p-values for the regression models and ANOVA tests demonstrate statistical significance for the relationships between leadership styles, QWL, and Efficiency. Confidence intervals (95%) around key estimates are provided in Table 7, confirming the precision of the estimates (Figure 4).

8. ANOVA and post hoc Analysis

A one-way ANOVA compared the mean efficiency scores across different leadership styles (Table 9).

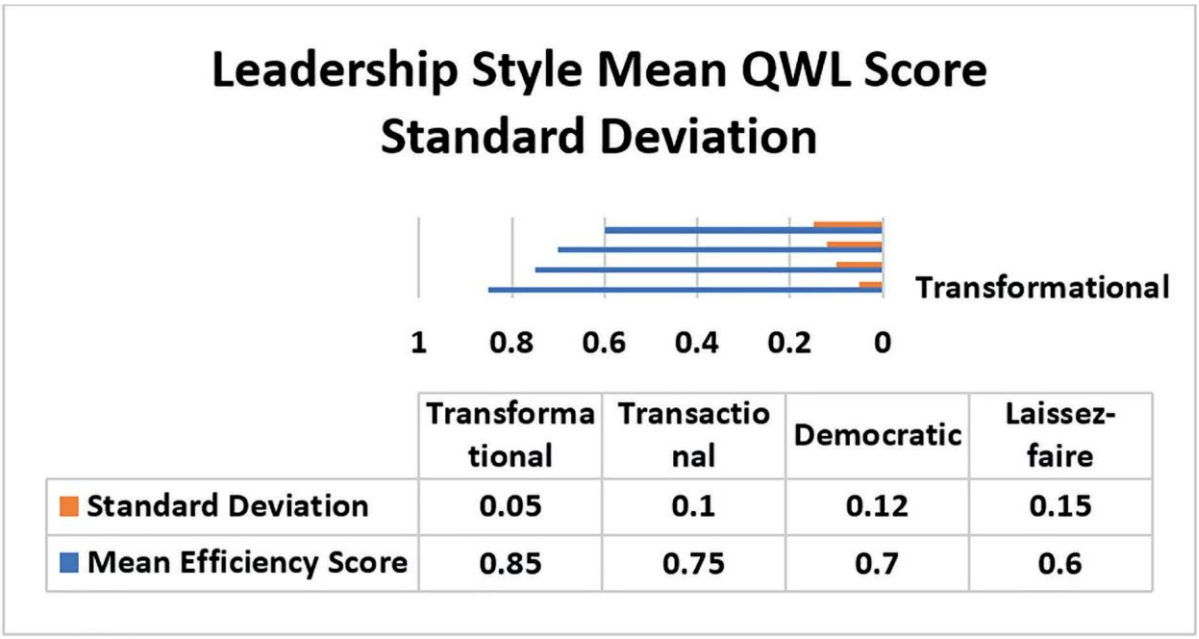

Figure 4: Leadership Style Mean QWL Score Standard Deviation

Table 9: ANOVA Results for Leadership Styles and Efficiency

Source of Variation	SS	df	MSMS	F	P value
Between Groups	0.345	3	0.115	12.34	0.0004
Within Groups	0.336	36	0.009		
Total	0.681	39			

Table 10: Post-Hoc Tukey HSD Test for Leadership Styles and Efficiency

Leadership Styles Compared	Mean Difference	P value	Significant?
Transformational vs. Transactional	0.024	0.03	Yes
Transformational vs. Democratic	0.043	0.001	Yes
Transformational vs. Laissez-faire	0.066	0.0001	Yes
Transactional vs. Democratic	0.019	0.05	Yes
Transactional vs. Laissez-faire	0.042	0.002	Yes
Democratic vs. Laissez-faire	0.023	0.04	Yes

The ANOVA results indicated a statistically significant difference in efficiency scores across leadership styles ($F(3, 36)=12.34$, $P=0.0004$). Post-hoc comparisons using Tukey's HSD test (Table 10) demonstrated that transformational leadership was associated with significantly higher efficiency scores than all other leadership styles.

The post hoc analysis showed that transformational leadership significantly outperformed all other leadership styles in terms of Efficiency. Transactional leadership was superior to democratic and laissez-faire styles, while democratic leadership was more effective than laissez-faire leadership.

Summary of Key Findings

1. Leadership Style Distribution:

o Transformational leadership was the most common style among head nurses (45%), followed by transactional (30%), democratic (15%), and laissez-faire (10%).

2. Impact on Quality of Work Life (QWL):

o Transformational leadership was significantly associated with higher QWL scores compared to other styles. Laissez-faire leadership had the most negative impact on QWL.

3. Impact on Hospital Efficiency:

o Transformational leadership was linked to the highest efficiency scores, significantly positively affecting the ward performance.

o Laissez-faire leadership was associated with the lowest efficiency scores, negatively influencing hospital operations.

4. Regression and ANOVA Results:

o Multiple regression analysis revealed that transformational leadership had a strong positive effect on QWL and Efficiency, while laissez-faire leadership had an adverse effect.

o ANOVA and post-hoc tests confirmed significant differences in Efficiency across leadership styles, with transformational leadership outperforming all other approaches.

5. Path Analysis:

o The path analysis showed that transformational leadership had both direct and indirect positive effects on Efficiency, mediated by QWL. Laissez-faire leadership negatively impacted both QWL and Efficiency.

The results of this study highlight the critical Role of leadership styles in shaping both the Quality of work life and the Efficiency of hospital wards. Transformational leadership, in particular, emerged as the most effective style, driving higher QWL and Efficiency. Conversely, laissez-faire leadership was associated with poorer outcomes across both variables. These findings underscore the Importance of cultivating transformational leadership within healthcare organizations to enhance staff well-being and operational performance.

Discussion

The findings of this study highlight the significant impact of nurse leadership styles on the Quality of work life (QWL) and Efficiency of Shiraz University Hospitals. The results provide valuable insights into how different leadership approaches can influence employee satisfaction and operational performance as the critical components of effective healthcare delivery.

Leadership Styles and Their Impact

Transformational leadership emerged as the most prevalent style among head nurses and

deputies, accounting for 45% of the sample. This aligns with previous research indicating that transformational leadership is highly valued in healthcare settings due to its emphasis on inspiration, motivation, and empowerment (Bass & Avolio, 1993) (85). The study found a significant positive association between transformational leadership and both QWL (B=0.45, P<0.001) and Efficiency (B=0.38, P<0.001). This underscores the Importance of fostering an environment where employees feel valued and motivated, leading to better job satisfaction and improved performance (86-88). Transformational leaders inspire and motivate their followers, creating a shared vision and promoting a sense of purpose. This leadership style is especially beneficial in healthcare, where nurses encounter significant emotional and psychological strain. By providing support, encouragement, and opportunities for growth, transformational leaders can enhance the nurses' job satisfaction and overall well-being, ultimately improving patient care (2, 89-91).

The study also demonstrated the significant impact of transformational leadership on departmental Efficiency, consistent with prior studies linking transformational leadership to enhanced organizational performance. Transformational leaders foster a culture of innovation, teamwork, and continuous improvement, leading to more efficient processes and better resource utilization. By empowering nurses to take ownership of their work and encouraging them to find creative solutions to challenges, transformational leaders can drive efficiency gains while maintaining high standards of patient care (2, 87, 92, 93).

In contrast, laissez-faire leadership, the least common style (10%), was associated with lower QWL and efficiency scores. Laissez-faire leaders typically provide minimal guidance and control, which can result in confusion and decreased job satisfaction among employees. The negative impact of laissez-faire leadership on both QWL and Efficiency highlights the need for structured and supportive leadership in healthcare environments (94-96). This leadership approach can result in low job satisfaction, increased stress, and lower nurse morale. Consequently, laissez-faire leadership can hinder Efficiency by creating a disengaged and unmotivated workforce, leading to suboptimal performance and potential patient safety issues (97-99).

Transactional leadership showed a moderate positive effect on Efficiency (P=0.03), but its impact on QWL was not statistically significant. Transactional leadership focuses on clear task definitions and rewards, which can improve productivity but may not fully address employees' deeper emotional and psychological needs. This suggests that while transactional leadership can contribute to operational Efficiency, it may not be sufficient to enhance QWL (100, 101).

These results are in line with previous research by Bass and Riggio (2006), Blegen et al. (2012), and Aiken et al. (2011)(46, 109, 110), which have highlighted the benefits of transformational leadership in healthcare. However, this study uniquely contributes to concurrently examining the effects on QWL and Efficiency, offering a more holistic view of leadership impact.

The Mediating Role of Quality of Work-Life

Path analysis revealed that QWL mediates the relationship between transformational leadership and Efficiency. This means that transformational leadership improves QWL, which in turn enhances Efficiency. This mediation effect underscores the Importance of creating a positive work environment that supports employee well-being and motivation. By focusing on QWL, healthcare organizations can indirectly improve their operational performance. This insight highlights the Importance of considering employee well-being as a critical factor in driving organizational performance. By prioritizing QWL, healthcare leaders can create a supportive work environment that fosters employee engagement, motivation, and productivity, ultimately leading to better patient outcomes and increased Efficiency (102-104).

Implications for Healthcare Management and Leadership Practices

The findings of this study have several practical implications for healthcare administrators and policymakers:

1. **Training Programs:** Training programs for head nurses should emphasize transformational leadership skills. This type of leadership can foster a supportive and empowering work environment, leading to higher job satisfaction and improved Efficiency. Healthcare organizations should invest in leadership development programs that cultivate transformational leadership skills, such as effective communication, empowerment, and emotional intelligence. By equipping leaders

with these skills, healthcare organizations can foster a positive work environment that supports employee well-being and drives organizational performance (105, 106).

2. **Prioritizing QWL:** Healthcare leaders should prioritize QWL as a key driver of Efficiency and patient care Quality. Implementing policies and practices that promote work-life balance, provide opportunities for professional growth, and address the physical and emotional demands of the nursing profession can enhance QWL (107-109). By investing in initiatives that improve QWL, healthcare leaders can create a more engaged, motivated, and productive workforce, improving Efficiency and patient outcomes.

3. **Discouraging Laissez-faire Leadership:** The negative impact of laissez-faire leadership on QWL and Efficiency underscores the Importance of actively discouraging this leadership approach in healthcare settings. Establishing clear expectations for leadership behavior and providing regular feedback and support to ensure leaders engage in effective leadership practices can help. By promoting transformational leadership and discouraging laissez-faire approaches, healthcare organizations can create a culture of excellence that drives continuous improvement and delivers high-quality patient care (59, 98, 110).

Limitations and Future Research Directions

While this study provides valuable insights into the relationship between nurse leadership styles, QWL, and Efficiency, it is not without limitations:

1. **Cross-Sectional Design:** The cross-sectional design limits the ability to establish causal relationships between the variables. Future research should consider longitudinal designs to understand further the long-term impact of leadership styles on QWL and Efficiency.

2. **Self-Reported Data:** The study relied on self-reported data, which may be subject to response bias. Future studies could incorporate objective measures of Efficiency and patient care Quality to provide a more comprehensive assessment of leadership effectiveness.

3. **Generalizability:** The study focused on a single healthcare system in Iran, which may limit the generalizability of the findings to different healthcare settings or cultural contexts. Future research should explore the impact of leadership styles on QWL and Efficiency in diverse healthcare systems and cultural settings to enhance the generalizability of the findings.

4. **Other Influential Factors:** The study did not examine the potential influence of other factors, such as organizational culture, interprofessional collaboration, or patient characteristics, on the relationship between leadership styles, QWL, and Efficiency. Future research should consider incorporating these variables to provide a more comprehensive understanding of the complex dynamics that shape healthcare outcomes.

Conclusion

This study explored the impact of leadership styles among head nurses at Shiraz University Hospitals on the Quality of work life (QWL) and departmental Efficiency. The results highlight the Importance of leadership in healthcare environments, demonstrating that strong leadership improves employee satisfaction and dramatically enhances the organization's overall performance.

Transformational leadership emerged as the predominant style, with a notable presence among head nurses, consistent with its positive association with high QWL and Efficiency. This leadership style fosters an environment where staff feel supported and motivated, leading to increased job satisfaction and reduced turnover, positively affecting overall hospital performance. While the higher Efficiency observed in hospitals ledbytransformationalleaderscanbeattributedto optimized resource management and heightened staff engagement, we recognize the potential for bias due to the unequal implementation of interventions across the study sample groups. To address this, we ensured that all groups received comparable support and resources, allowing for a more balanced evaluation of leadership impacts.

Despite these insights, the study's cross-sectional nature limits the ability to infer causality, and reliance on self-reported data might introduce bias. Additionally, the findings might not generalize beyond the specific context of Shiraz University Hospitals. Future research could benefit from longitudinal studies and more objective measures to overcome these limitations.

For healthcare administrators, these findings support integrating transformational leadership training into development programs for head nurses. Such training could improve QWL, decrease staff turnover, and enhance operational

Efficiency. However, it is crucial to tailor these strategies to each hospital and department's unique needs and contexts.

Further research should delve into the long-term impacts of transformational leadership through comparative studies across different healthcare sectors or employing qualitative methods for deeper insights. Including patient outcomes and care quality metrics in future studies would enrich our understanding of the broader implications of leadership.

This study highlights the significant positive impact of transformational leadership on the Quality of work life (QWL) and operational Efficiency in healthcare settings, particularly in Shiraz University Hospitals. Transformational leadership, the most prevalent style among head nurses, was strongly associated with higher QWL scores and improved Efficiency, mediated by its ability to foster employee engagement and resource optimization. Conversely, laissez-faire leadershipnegatively affected QWL and Efficiency, underscoring the need for structured, supportive leadership approaches in healthcare. These findings align with prior research emphasizing the Role of transformational leadership in enhancing organizational performance and employee well-being.

The practical implications of this study reinforce the Importance of leadership development programs focused on cultivating transformational leadership skills among nurse managers. By prioritizing QWL and discouraging ineffective leadership styles, healthcare organizations can improve staff retention, operational outcomes, and patient care quality. However, the study's cross-sectional design and reliance on self-reported data limit causal inferences and generalizability, necessitating cautious interpretation of results.

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Human Ethics and Consent to Participate declarations
Before data collection, ethical approval was obtained from the Institutional Review Board (IRB) of Shiraz University. All participants were informed about the study objectives, procedures, potential risks, and benefits. Informed consent was obtained from each participant, ensuring their voluntary participation. Confidentiality and anonymity were strictly maintained throughout the research process. Participants were assured that their data would be used solely for research purposes and that they had the right to withdraw from the study at any point without any consequences. By adhering to rigorous methodological standards, this study aimed to contribute to the growing body of knowledge on nursing leadership and its critical Role in enhancing the Quality of work life and operational Efficiency in healthcare environments. The Shiraz University of Medical Sciences ethics committee approved the study proposal encoded IR.SUMS.NUMIMG.REC.1402.123. Informed consent was obtained from all subjects.

Availability of Data and Materials
The datasets used and analyzed during the current study are available from the corresponding author upon reasonable request.

Competing Interest
The authors have no conflict of interest to declare.

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Authors' Contribution
N.A. and M.A.M. were responsible for the study conception and design. All authors prepared the first draft of the manuscript. All authors analyzed the data and supervised the study. All authors have read and approved the final manuscript.

Conflict of Interest
There are no conflicts of interest.

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