BMC Nursing

RESEARCH

Open Access

Measured nursing perception of the working environment through authentic leadership with technology support and OCB among Chinese public hospitals

Abid Hussain[1], Wang Ruowei[1], Xu Xia[1], Shahida Kanwel[2*], Shen Chunhong[1] and Arif Jameel[3*]

Abstract

Nursing is a comprehensive discipline that applies principles from the natural and social sciences to diagnose and address existing or potential health problems and their responses. The morale and productivity of nurses are essential for providing quality healthcare services in busy and high-stress environments. However, nurses' perceptions of the hospital working environment (PHWE) can hinder these goals. This study examines the role of nursing authentic leadership (NAL) in mitigating perceptions of the hospital working environment and its subsequent effects on nurses' organizational citizenship behaviors as organizational and individuals (NOCBO&I), nurses' technological support (NTS), and nurses' task-oriented performance (NTP) among hospital employees. The research involved 557 nurses from public sector hospitals in Shandong Province, China. Data was collected between August and November 2024 and analyzed using structural equation modeling (SEM). The findings reveal that perceptions of the hospital working environment significantly affect nurses' technological support, nurses' organizational citizenship behaviors (NOCBO&I), and task-oriented performance. Additionally, authentic leadership is significantly correlated with perceptions of the hospital working environment, positively influencing technological support, task-oriented performance, and NOCBO&I. This study underscores the vital role of authentic leadership in moderating the profound impacts of the working environment, fostering a positive atmosphere in hospitals, and enhancing nurse productivity with the support of technology. The insights gained from this research provide valuable implications for nurse leaders seeking to improve hospital performance through effective leadership practices.

Keywords Hospital working environment, Nurses task-oriented performance, Nurses technological support, NOCBO&I, Shandong, China

*Correspondence:
Shahida Kanwel
shahidakanwel@yahoo.com
Arif Jameel
arifjamil24@gmail.com
[1]School of Nursing, Shandong Xiehe University, Jinan 250109, PR China
[2]School of Management, Jiangsu University, Zhenjiang, Jiangsu 212013, PR China
[3]School of Business, Shandong Xiehe University, Jinan 250109, PR China

Introduction

In the past three decades, leadership studies have moved from traditional, leader-focused approaches to being more relational and interactive, aligning with the dynamic between leaders and followers [1]. However, authentic leadership has become a crucial construct among these changing paradigms; it involves a leader's authentic and genuine expression of values and behaviors that are consistent and resonate genuinely with their followers' needs and aspirations [2].

Nursing authentic leadership (NAL) is a leadership style in which nurse leaders behave genuinely, transparently, and ethically, maintaining trust with their team members and fostering positive relationships [3]. This approach emphasizes self-awareness, relational transparency, balanced decision-making, and an internalized moral perspective. Real nurse leaders lead by example, embodying their values and incorporating them into every aspect of their work, creating a supportive and empowering environment where professionals can grow in their practice while delivering the best possible care to their patients [4]. Although nursing authentic leadership has a well-documented positive effect on follower outcomes [5], gaps exist regarding applying this trait in particular organizational contexts, notably in complex public sector hospital settings with demanding work conditions, intricate power dynamics, and high resource dependency.

Nurses' Organizational Citizenship Behavior (organization-focused and individual-focused, NOCBO&I) refers to extra-role behaviors beyond the mandated job responsibilities performed by nurses in the hospital that contribute to the functioning and effectiveness of the hospital [6]. These are behaviors that are not immediately rewarded but are nonetheless critical to fostering a work culture and enhancing organizational performance [7]. A unique setting to observe the impact of leadership styles consists of public sector hospitals, where nurses and professionals constantly work under tremendous pressure to look after patients' health and avoid life-threatening errors in care delivery [8]. Drug administration errors, including work under the influence of the public-sector hospitals' leadership. Nurses are met with extended working hours, heightened stress, and resource constraints; these contribute to resource depletion, burnout, and disengagement [9]. Authentic leadership in this context has a key role in developing a positive working environment, attuning to the conflicting demands emanating from nursing obligations and staff welfare, while minimizing undesirable outcomes [10].

To address this issue, our study integrates three foundational theoretical perspectives: social exchange theory (SET), social learning theory (SEL) and conservation of resources (COR) theory. The Social Exchange Theory, based on an exchange of resources between leader and follower, is explained by the principle of reciprocity specified by Blau (1964), in that positive interactions between the leader and follower increase the trust, commitment, and cooperation in organizations [11]. SET principles are compatible with authentic leadership, which is defined through transparency in relationships, integrity, and self-awareness, as authentic leadership cultivates high-quality exchanges that nurture trust and cooperation in healthcare teams [12]. Elshikh [13] suggests that nurses' mental well-being and task performance in high-pressure environments depend primarily on preserving and replenishing their personal resources (such as time, energy, and social support).

From the social learning theory perspective, Albert Bandura shows that people learn by observing and understanding actions before repeating them [14]. According to Bandura's model, people learn from observing others through four main steps, including focusing on behavior models and retaining seeing [15]. SEL can explain in detail how the different elements in the nursing context interplay and affect the nurse's behaviors and performance. It treats the individual-level learning process and the learning social environment [16]. The theory explains how nurses can learn new skills and behaviors to perform better and contribute to the organization, which is important because nursing is a field of continuous learning and adaptation [17]. Authentic nurse leaders can be expected to act in a specific manner as they assume the role of role models. Self-evaluations include decision-making, patient care framework, and leadership among nurses. By observing, a nurse will most likely replicate these behaviors and cause improved task performance and OCBO&I [18].

The Conservation of Resources (COR) Theory provides an essential lens through which this study interprets nurses' experiences in public hospitals. COR Theory posits that individuals strive to obtain, retain, and protect valuable resources such as energy, time, emotional stability, and social support, particularly in high-demand environments [19]. In resource-constrained hospital settings, nurses face substantial risks of resource depletion due to extended working hours, high stress levels, and limited organizational support [20]. When personal and professional resources are threatened or lost, it can lead to burnout, disengagement, and reduced organizational citizenship behaviors (NOCBO&I) [21]. Authentic leadership is a protective factor that helps replenish these critical resources by fostering trust, transparency, and support. Furthermore, technology support is an additional resource that can alleviate workload pressures and enhance nurses' capabilities [22]. By integrating COR Theory, this study examines how authentic leadership and technology support can buffer the adverse effects of hospital work environments on nurses' performance and

well-being, ultimately promoting resilience, engagement, and extra-role behaviors within healthcare organizations.

Increasingly, leadership effectiveness is recognized as being mediated by technological and environmental factors. Recent studies show that organizational culture affects how authentic leadership manifests and produces positive outcomes. For example, the influence of authentic leadership on workplace spirituality was moderated by the organizational environment [23], and organizational working environments mediated the impact of authentic leadership on collective thriving [24]. Although these advances have occurred, little research has focused on the extent to which authentic leadership is the relationship between several variables in various service sectors, such as support [24], education [25], information technology [26], and banking [27]. To address this gap, our study investigates the moderating role of nurses' authentic leadership in public sector hospitals, its effects on nurses' task-oriented performance, and organizational citizenship behaviors toward individuals and organizations (NOCBO&I). We examine how technology support can facilitate these dynamics, enabling resource replenishment and resource-intensive behaviors in resource-constrained environments.

The combination of nursing task-oriented performance, nursing technological support, NOCBO&I, and leadership dynamics provides researchers with a comprehensive method to assess their combined effects on operational performance, organizational citizenship, and psychological aspects within nursing practice. To address this gap, our study investigates the moderating role of nurses' authentic leadership in public sector hospitals, its effects on nurses' task-oriented performance, and organizational citizenship behaviors toward individuals and organizations (NOCBO&I). We examine how technology support can facilitate these dynamics, enabling resource replenishment and resource-intensive behaviors in resource-constrained environments. Specifically, we aim to answer the following questions:

1. What is the relationship between PHWE and NTP, and how does NAL moderate this relationship?
2. Does NAL reduce the effect of PHWE on NOCBO&I (organizational and individual-focused behaviors)?
3. Next, what does technology support do to enhance the benefits of NAL and bring positive nursing outcomes?

The research enhances the theoretical understanding of authentic leadership practices in healthcare institutions that require extensive resources. It illustrates how leadership techniques from the public sector can be applied to private healthcare organizations, yielding insights relevant to hospital policies and management systems. The study examines the necessary adaptations of public healthcare leadership approaches for the private sector while highlighting the importance of context-specific leadership models in effectively addressing public healthcare challenges. Additionally, this research explores how authentic leadership, supported by technology, mitigates negative aspects of the hospital work environment while enhancing nursing workforce engagement, productivity, and resilience.

Although interest in authentic leadership in healthcare has grown, research reveals significant weaknesses in this area. Several Previous studies have focused on general leadership outcomes without examining the interaction between authentic leadership and technological support in public hospitals, where resources are often limited [28–30]. Recent research emphasizes the importance of nurse performance and ethical teamwork as critical workplace outcomes, yet it remains limited due to insufficient integration of these factors [31]. Additionally, studies have not demonstrated how authentic leadership and technology can enhance resources for frontline healthcare workers [32], as explained by the Conservation of Resources Theory [33].

To address these gaps, this study operationalizes nursing authentic leadership, technological support, and COR theory to create a model that explains that leadership and technological resources enhance task performance and organizational citizenship behaviors (OCBs) among nurses. It seeks to develop theoretical knowledge by applying COR theory to examine that authentic leadership and technological support bolster nurses' psychological and functional resources, offering an integrated perspective on task-oriented and extra-role behaviors (NOCBO&I) within the public health sector. The research also provides insights into about leadership and technology interact to improve various aspects of nursing. Furthermore, this study fills the existing literature gaps on authentic leadership and offers recommendations for enhancing staff management in healthcare facilities facing limited resources. We proposed the hypothesized model based on theoretical analyses and empirical research (see Fig. 1).

Hypothesis development

This study integrates several core constructs to examine how authentic leadership and technology support influence nursing outcomes in resource-intensive healthcare settings.

Definitions of Constructs:

- Nursing task-oriented performance (NTP) evaluates how effectively nurses systematically and accurately perform these fundamental patient care responsibilities. This encompasses administering

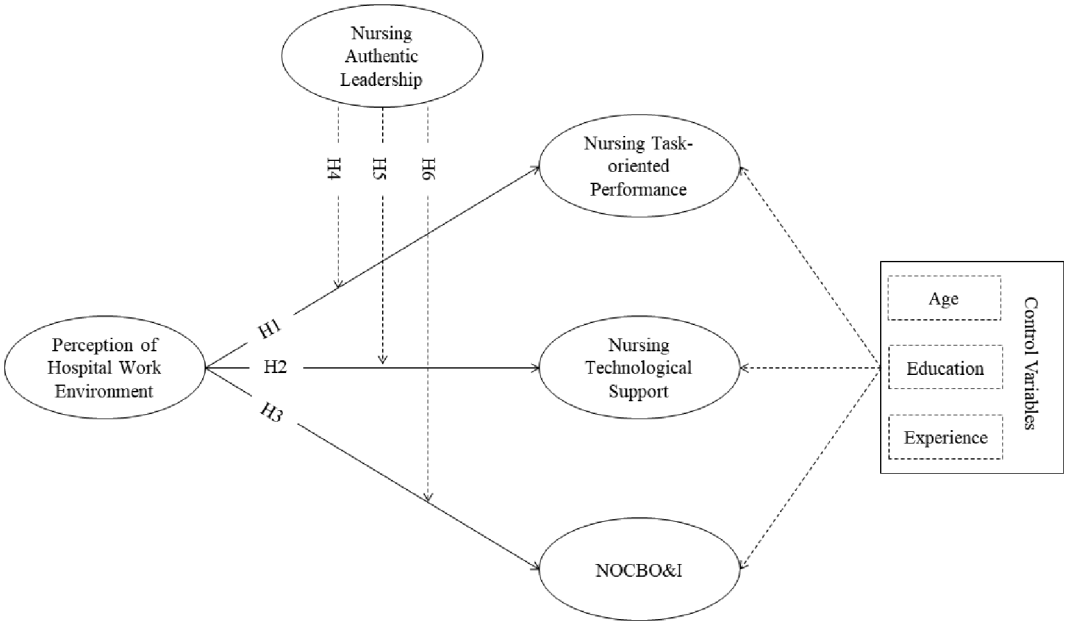

Fig. 1 Study conceptual framework

medication, charting, and addressing critical patient needs. Furthermore, high task-oriented performance demonstrates nurses' capacity to maintain clinical quality and safety, even in stressful circumstances [34].

- Nursing technological support (NTS) assesses nurses' comfort with digital technology, such as artificial intelligence programs and computer-based medical records. This concept reflects the support nurses receive from their workplace and the technological tools available to enhance patient care and streamline their tasks [35, 36].
- Nurses' organizational citizenship behaviors toward Individuals and the organization (NOCBO&I) are considered the voluntary, extra role behaviors of nurses performed above and beyond the job duties prescribed in their job descriptions. Endorsing the hospital image to outsiders or supporting institutional goals is considered as NOCBI (organization-focused), while assisting or aiding colleagues, mentoring junior staff, and propagating teamwork are classified as NOCBI (individual-focused) [37, 38].

These constructs are related but distinct. While NTP assesses how effectively nurses perform their assigned clinical tasks, NTS evaluates the environmental support that enables performance, and NOCBO&I examines voluntary contributions that enhance the broader organizational climate. Together, these dimensions provide a comprehensive understanding of how authentic leadership and technological resources influence formal performance and discretionary efforts within public hospital settings.

The scholar selected the variables based on a scientific rationale, which posits that nurses perform basic patient responsibilities step-by-step to evaluate how well they handle duties such as administering medical therapy and charting under pressure. Throughout crisis leadership scenarios, this performance demonstrates precisely how well nurses can apply their skills to care for patients [39]. By analyzing this aspect, the study examines whether nurses can effectively integrate leadership strategies and technology tools to deliver safe care.

Technology incorporation is accepted as a dependent variable that considers the role of digital tools, particularly artificial intelligence, in modern healthcare delivery. This variable addresses how nurses feel empowered to access and effectively utilize technological resources [40]. Given the growing complexity of hospital environments, particularly during crises, understanding this support helps evaluate the success of AI training and infrastructure in aiding nursing operations, reducing workload, and improving decision-making capabilities [36]. Organizations experience multiple outcomes resulting from Organizational Citizenship Behavior, individual aspects, and institutional factors such as commitment and loyalty [41]. The described dimensions help evaluate broad organizational environments that shape nurses' psychological responses and behaviors toward their work environment [42].

Association of PHWE and NTP

Employee performance is a widely recognized element in organizational behavior, where performance management is considered a significant component. PHWE assesses how healthcare professionals evaluate various aspects of their workplace in a hospital setting. This includes evaluations of physical conditions, organizational culture, interpersonal relationships, and support systems that help determine their job satisfaction, performance, and well-being [43]. This positive relationship between the perception of the hospital working environment (PHWE) and nursing task-oriented performance (NTP) has important implications for healthcare. A conducive working environment in a hospital promotes nurses' competence, motivation, and well-being, increasing their ability to perform clinical and administrative duties effectively [44]. Adequate staffing, access to necessary resources, supportive leadership, and clear communication channels create an environment that allows nurses to focus on patient care without distractions or stress [45]. This link is particularly important since nurses provide an essential link in delivering quality and safe healthcare and are considered critical to overall organizational success [36]. The association has been studied from a research perspective; it is an interesting research question from the broader perspective of how organizational factors affect nursing performance and patient outcomes. Researchers can identify key environmental elements that influence task-oriented performance and, in doing so, inform hospital administrators and policymakers about areas that could use improvement, including workload, resource allocation, and workplace culture [43, 46].

Understanding these dynamics is essential for creating custom interventions designed to boost nursing performance, forestall errors, improve efficiency, and increase patient satisfaction in healthcare establishments [47]. Moreover, this link emphasizes the need to invest in nursing staff's health and professional development as a crucial component of a long-range health design. For nurses, creating a positive working environment improves their task performance and takes care of some issues nurses face in the sector, such as burnout, job dissatisfaction, and turnover [48]. The healthcare industry can gain from the research on PHWE and its effects on NTP to create sustainable practices, maintain staff retention, and create a continuous improvement culture. All this contributes to long-term organizational resilience and improved patient health outcomes, and hence, exploring this relationship remains an important issue for further research and policy development.

H1 PHWE influenced positively to NTP.

Association of PHWE and NTS

Understanding how workplace conditions affect the effective use of technology in healthcare requires a positive association between the perception of the hospital working environment (PHWE) and nursing technological support [49]. A well-structured working environment that promotes and facilitates nurses' utilization of technological tools to improve patient care and complete flow in the hospital's operation gives them dense support [36]. Nurses are more likely to adopt and effectively use technologies such as electronic health records, automated medication systems, and diagnostic tools when they perceive their workplace as providing enough resources, training opportunities, technical support, etc. It also improves the quality of care, making it efficient and less likely to cause errors [50].

From a research point of view, studying the link behind this association confirms the importance of developing a good working environment that will work towards the good integration of technology for hospital services. This allows us to understand organizational factors that allow nurses to harness technological advancements to improve healthcare delivery. However, hospitals can fill the gaps in technology adoption and optimize how they utilize existing tools through training, infrastructure, and leadership support [51–53]. In addition, this relationship emphasizes how workplace policies can be calibrated to technological advancement, which allows nurses to keep up with the rising demands of this rapidly changing clinical world without compromising on quality patient care.

H2 PHWE influenced positively to NTS.

Association of PHWE and OCBO&I

Perception of the hospital working environment has a positive relationship with organizational citizenship behavior (individual and organizational) OCBI & OCBO, which is very important for the better functioning of healthcare institutions [6]. In supportive, fair, and well-organized hospital environments, employees are more likely to engage in tasks or behaviors beyond the formal job description that are beneficial for their colleagues (OCBI) and the organization as a whole (OCBO) [54]. Employers should consider the value and support nurses feel. For example, valued and supported nurses may support colleagues through complex tasks, coach new staff, and help build a positive workplace culture. Such behaviors promote teamwork, reduce workplace conflicts, and result in efficient and harmonious hospital operations [55].

From a research perspective, the exploration of this association relates to the existence of organizational factors that support discretionary and altruistic behaviors critical in high-stress environments such as hospitals.

Understanding how perceptions of the work environment relate to OCBI and OCBO can provide healthcare administrators direction for developing interventions that will promote workplace satisfaction and engagement [30, 56]. This could be achieved through initiatives like better leadership practices, better communication, and more opportunities to grow professionally [7]. In addition to its implications for patient care outcomes and the prevention of turnover, this article highlights its significance for sustaining citizenship (pro-social) behaviors and, therefore, enhancing the reputation and sustainability of healthcare organizations.

H3 PHWE influenced positively to OCBO&I.

Nursing authentic leadership (NAL)

Hospitals are service-oriented institutions, and institutional dynamics within their organizations determine their achievements. These dynamics take different shapes, such as decision-making, resource allocation, and patient care scheduling; they often involve complicated interpersonal interactions [57, 58]. In this vein, NAL is key in that it advances values alignment, transparency, and ethical decision-making [59]. The management of the PHWP among authentic nursing leaders can take heed in cultivating a culture of trust, fairness, and open communication [60]. This is due to hospital leadership providing a supportive and inclusive atmosphere, encouraging nurses to remain committed and engaged in their hospital care mission [61]. It entails making access to technological advancement possible, organizing and maintaining continual education and training programs, developing patient services, and strategically implementing organizations [62]. Hospitals can create a sustainable, high-quality workplace through authentic leadership while motivating and supporting healthcare professionals and patients [4, 63].

Social exchange theory (SET)

SET relationships are developed on reciprocal exchanges by Blau, 1964 and interactions based on mutual benefit expectations [64, 65]. Through the PHWP in hospital settings, effective nursing leadership creates a trusting culture by encouraging transparency in decision-making, reducing uncertainty, and vindicating a fear of a hidden agenda [12]. Nursing leaders aligning with SET principles manifest commitment and trust by setting up reciprocal relationships with their teams [66]. This also helps nurses stay involved in high-quality patient care, educational programs, and organizational strategies [67]. By harnessing authentic and transparent leadership, hospitals can realize a positive work environment that molds their employees' well-being and healthcare services [68].

Social learning theory (SLT)

SLT was developed by Bandura (1977), who suggested that the learning processes of a behavior can be acquired through the observation and imitation of others in a social context [14]. SLT is an essential framework for explaining how nurses can develop and demonstrate nursing task-oriented performance and organizational citizenship behaviors toward individuals and the organization in nursing settings through NAL [18]. Nurses usually learn and model these behaviors by observing peers, leaders, and the organizational culture, particularly in the hospital working environment [69].

Nurses show increased commitment and proactive behaviors through observational learning, which happens when hospital working environments demonstrate positive support through collaboration, professional modeling, and recognition [70]. The successful implementation of nursing technological support receives support from vicarious learning and social reinforcement, through which nurses observe others effectively incorporating technology in their care delivery [36]. SLT demonstrates that environmental elements and social interactions produce the complete formation of nurse performance and professional practices [71].

Conservation of resources (COR) theory

According to the Conservation of Resources (COR) Theory, individuals pursue acquiring, maintaining, and protecting valued resources; when depleted, resources may result in adverse outcomes [72]. Effective nursing leadership in hospitals contributes to preserving these resources through a culture of fairness and meritocracy by reducing perceptions of favoritism and espousing core values [73]. With nursing leaders' support of open communication, professional development, and psychological support, the staff becomes resilient in the face of the difficulties brought up by the PHWP [63]. Leading by example protects employees' well-being and improves their engagement, motivation & job satisfaction. Nursing leaders, through COR, conserve and strengthen workplace resources to build an environment where nurses can dedicate themselves to providing high-level patient care and engage OCB, which ultimately supports the hospital's mission and success [74, 75].

Nurses' perceived work environment can either promote or discourage their motivation related to task performance. However, in an authentic leadership situation, Hobfoll [76] suggests that COR encourages nurses to continue to be committed to the hospital's mission regardless of workplace challenges. At the hospital level, COR can provide useful clues about how to create effective workplaces and enhance the effectiveness of nursing within the context of service institutions [77]. authentic nursing leadership introduces a culture of fairness

and meritocracy by prioritizing core professional values, which helps minimize perceptions of favoritism throughout the hospitals [57]. This eventually brings the psychological well-being of nurses into play since authentic leaders encourage open communication while at the same time offering avenues for professional development, which fortifies them against the harmful effects of PHWP [59].

The relationship between the work environment and performance has been examined previously, with the identification of several moderators. Take, for instance, Lee and Na [78] discovered that public service motivation can shrink the effect of workplace circumstances on performance; highly motivated employees may stay dedicated to their roles regardless of the demanding work environment. Also, age and job autonomy have been demonstrated to buffer workplace conditions greater work autonomy has a protective effect on the impact of workplace dynamics, resulting in positive effects on TP [79]. In addition, the impact of PHWP on nursing performance may vary depending on organizational context: different service provider settings face different levels of workplace challenges [80].

Nursing leaders do not encourage workplace politics or environmental uncertainty to deflate motivation. Instead, they create transparency, foster trust, and develop a value-based work culture to allow nurses to continue to see the 'big picture' of patient care as well as the overall goals of the hospitals they work for [81]. Through an environment based on equity, open communication, and professional integrity, NAL provides nurses a place to perform in the best ways we know how, despite pressures from the outside. Further empirical studies in hospital settings are needed to nuance NAL's role as a workplace dynamics buffer and provide strategies to improve nursing efficiency and healthcare service delivery [82].

Similarly, authentic leadership plays a crucial moderating role in the relationship between servant leadership and organizational creative behavior in the services sector. Specifically, when AL is strong, the association impact of environment on OCBO&I both (individual and organizational) is also high on the performance, fostering a more positive association between personnel discretionary efforts and their commitment to the institution, even in the presence of workplace challenges [2]. While research on this dynamic within the hospital sector remains limited, previous findings from service and nonprofit organizations suggest that the principles of authentic leadership are widely applicable and can be effectively implemented to enhance teamwork, collaboration, and overall hospital performance.

Leadership, in its proper form, involving self-awareness, relational transparency, internalized moral perspective, and balanced processing, is a crucial moderating factor that plays its part in the service sector. The effects of organizational commitment and job satisfaction on employee performance can be improved by implementing authentic leadership in customer-oriented industries, such as hospitality, healthcare, and tourism [3, 83, 84]. It has been empirically shown that employees' acceptance of authentic leaders leads to the enhancement of trust and psychological safety and, consequently, a substantial positive impact on job satisfaction and service quality [85]. A study defined authentic leadership as a moderator of the association between psychological empowerment and employee engagement, enhancing service delivery and its effect on customer satisfaction [86].

In the case of employee well-being and managing stress, authentic leadership is also a buffer against work-related stressors, thus moderating the impact of work demands on employee burnout. Authentic leadership reduces the detrimental effects of role stressors, i.e., workload and emotional exhaustion, by providing an enabling and supporting work environment [3]. Authentic leaders tend to assist their employees by using optimistic coping approaches, which help reduce the adverse outcomes of job stress and upsurge general well-being. High-pressure services in which emotional workers are significant to job performance illustrate this finding well [57].

In addition, authentic leadership moderates the effects of organizational justice and psychological contract fulfillment on organizations' extra-role behaviors (organizational citizenship behaviors). Empirical evidence to support this statement from a study conducted by Kurian and Nafukho [87] employees who opt to work in an environment where they perceive fair treatment of employees and strong psychological contracts are more likely to engage in OCBs when leaders are perceived as authentic. Given that most work occurs in the service sector, where customer interaction is likely to demand discretionary effort, authentic leadership creates an ethical workplace environment and inner motivation among nurses, resulting in a better quality of service and patient loyalty. In addition, these findings highlight how authentic leadership increases the chances of creating service-oriented work environments and the possibilities of maximizing employees' potential.

H4 NAL moderates positively between the PHWE and NTP.

H5 NAL moderates positively between the PHWE and NTS.

H6 NAL moderates positively between the PHWE and OCBO&I.

Methodology

Context selection

Data were collected using a structured questionnaire and random sampling, a standard method in social science research for testing hypotheses. The data collection occurred between August and November 2024 from nurses working in public hospitals across various Shandong Province, China cities. One of China's most populous and economically significant regions, Shandong Province, located on its eastern coast, has a well-developed healthcare framework, serving as a key partner in delivering medical services to its residents [88].

Understanding the nurses' work environment and performance is crucial, given the increasing demand for quality nursing care in the province's extensive network of hospitals. The questionnaire was divided into two sections: the first section was made to gather demographic information, and the second section was used to measure the key variables: perception of the hospital working environment (PHWE), nursing task-oriented performance (NTP), nursing technological support (NTS), organizational citizenship behavior at both individual and organization level (OCBI & OCBO) and nursing authentic leadership (NAL). The sample size for the distribution of the 750 questionnaires was determined based on Saunders [89] and Krejcie [90].

The response rate was 74%, and 557 valid responses were obtained. The data collected obtained a valuable understanding of the relationship between leadership, organizational behavior, and nursing performance in Shandong Province's healthcare sector. Due to the province's push to improve hospital services, evidence relating to nurses' responsibilities for patient care and nurses' leadership and performance is significant to the broader discussion on enhancing nursing efficiency, leadership dynamics, and healthcare management in China.

The study team provided all participants with a detailed briefing on the research objectives, an explanation of the procedures, risk identification, and a description of the benefits. Each participant provided informed consent before the study, and researchers ensured the confidentiality of responses with complete privacy and unrestricted withdrawal rights throughout the research. The researchers maintained secure storage of the data collection materials and focused all research uses exclusively on the collected data.

Table 1 Demographic details

Characteristics (*N* = 557)	Frequency	Percentage
Gender		
Male	169	30.34%
Female	388	69.66%
Age (years)		
20–30	193	34.66%
31–40	227	40.76%
41–50	115	20.64%
51 to above	22	3.94
Education		
Bachelor degree	251	45.06%
Master degree	306	54.94%
Experience		
6 months < 1 years	33	5.93%
1–5 years	197	35.38%
6–10 years	155	27.83%
11–15 years	129	23.16%
16–20 years	43	7.7%

Construct development

All items were adapted from the previous studies, including NAL, OCBO&I, NTS, NTP, and PHWE. NAL was measured through 16 constructs adapted from the [91] and [92] with the sample item "To what extent has your leader improved the quality of your work life". The OCBO&I evaluated 8 items adapted from [93] with the sample item "Willingly offer your time to assist others with work-related issues". NTS was measured by 8 items adapted from [36] with the sample item "Hospitals support the use of technology to enhance healthcare delivery". NTP was measured by 7 items adapted from [39] with the sample item "Providing instructions for care at home". PHWE was measured through 12 items adapted from [94] with the sample item, "Staff nurses have the opportunity to serve on hospital and nursing committees". Appendix 1 lists all constructs. Table 1 shows the respondents' demographic characteristics, including gender, age, education, and experience. A 5-point Likert scale was used to measure all questions, with 1 representing strongly disagree, 2nd disagree, 3rd neutral, 4th Agree, and 5th representing strongly agree. Demographic variables were used as control variables for potential confounding effects; age, education, and tenure were among these.

Establishing the reliability of the questionnaire

Before the primary research, a pilot study was conducted to test the reliability of the questionnaire. For this preliminary assessment, 49 participants constituted a sample of about 8.79% of the target population. Cronbach's alpha (CA) test, a well-known method to evaluate the scale reliability, was applied to measure the internal consistency in SPSS. It is standard [36, 95], and [96] in social science research, a Cronbach's alpha coefficient of 0.7 or higher (a well-established reliability threshold) is deemed acceptable. Table 2 presents the results, confirming that the questionnaire passed this reliability threshold. Hence, the respondents understood the constructs, as shown in Table 1; an overview of measured constructs and their

Table 2 Establishing the reliability of the study

Variables	CA coefficient
NAL	0.863
NTP	0.849
NOCBO&I	0.835
NTS	0.829
PHWE	0.878

Note: NAL = Nursing Authentic Leadership, NOCBO&I = Nursing Organizational Citizenship Behavior (Organizational & Individual), NTS = Nursing Task-oriented Performance, NTP = Nursing Technological Support, PHWE = Perception of Hospital work Environment,

Cronbach's alpha coefficients supports the instrument's robustness for the main study.

Analysis methods

The study used reliability, validity, correlation, descriptive statistics, structural equation modeling (SEM), the social science statistical package (SPSS), and analysis of moment structure (AMOS). Confirmatory Factor Analysis (CFA) and SEM were run to examine the hypothesized model [97]. SEM was used to test the study hypotheses, a widely used method for healthcare research [36, 98–100]. Consistency analysis [101] was performed to test the reliability and validity of all measurement items.

A measurement model was specified to assess the relationships of the studied constructs with the items covering them. The analysis was conducted using Ahmadi, Abdi [102] suggested a three-stage SEM approach by following it sequentially. The items' component scores were first evaluated using the measurement model. Second, some discriminant validity is assessed with CFA. Finally, the relationship of the study variables by causal relationship was studied using SEM [103]. The causal procedures were designed to uphold the validity and reliability of the causal model. Moreover, the mediating effects were analyzed by using AMOS 21.0 and SPSS.

Results

Descriptive statistics

Table 3 describes the study variables and descriptive statistical analyses such as correlations, means, standard deviations, and average variance extracted. From the results, there was a significant relation between NAL to NOCBO&I ($r = 0.33$, $p < 0.01$), NTS ($r = 0.08$, $p < 0.01$), NTP ($r = 0.34$, $p < 0.01$), and PHWE ($r = 0.49$, $p < 0.01$). Additionally, NOCBO&I also significantly correlated with NTS ($r = 0.39$, $p < 0.01$), NTP ($r = 0.43$, $p < 0.01$), and PHWE ($r = 0.49$, $p < 0.01$), whereas NTS also significantly correlated with NTP ($r = 0.38$, $p < 0.01$) as well as NTP significantly correlated with PHWE ($r = 0.37$, $p < 0.01$).

The five variables used in this research were NAL, NOCBO&I, NTS, NTP, and PHWE. The Cronbach's α values and factor loadings are demonstrated in Table 4. As per Nunnally and Bernstein [101], the recognized α

Table 3 Descriptive statistics

	Variables	AVE	Mean	SD	Correlations							
					1	2	3	4	5	6	7	8
1	Age	-	2.81	1.69	-							
2	Education	-	1.99	1.81	0.7	-						
3	Experience	-	2.18	1.17	0.21*	0.13*	-					
4	NAL	0.67	3.07	1.09	0.15*	0.16*	0.07	-				
5	NOCBO&I	0.63	3.15	1.03	0.17*	0.09	0.08	0.33**	-			
6	NTS	0.69	2.93	1.09	0.07	0.06	0.04	0.08**	0.39**	-		
7	NTP	0.75	3.26	1.48	0.09	0.11*	0.12*	0.34**	0.43**	0.38**	-	
8	PHWE	0.71	3.54	1.37	0.02	0.08	0.03	0.49**	0.49**	0.31**	0.37**	-

Note: AVE = Average Variance Extracted, NAL = Nursing Authentic Leadership, NOCBO&I = Nursing Organizational Citizenship Behavior (Organizational & Individual), NTS = Nursing Task-oriented Performance, NTP = Nursing Technological Support, PHWE = Perception of Hospital work Environment, Significance level: *$p < 0.05$; **$p < 0.01$

Table 4 Confirmatory factor analysis CFA

Factor	Items	Loadings	S. E	t	C.*R*	A
NAL	NAL1	0.713	0.050	14.26**	0.93	0.95
	NAL2	0.831	0.045	16.24**		
	NAL3	0.742	0.051	14.54**		
	NAL4	0.738	0.047	15.70**		
	NAL5	0.950	0.060	12.50**		
	NAL6	0.861	0.053	14.35**		
	NAL7	0.783	0.062	12.62**		
	NAL8	0.894	0.052	15.26**		
	NAL9	0.747	0.059	12.66**		
	NAL10	0.779	0.060	12.98**		
	NAL11	0.962	0.054	14.11**		
	NAL12	0.721	0.048	15.02**		
	NAL13	0.809	0.055	12.89**		
	NAL14	0.715	0.061	11.72**		
	NAL15	0.887	0.049	16.06**		
	NAL16	0.798	0.053	15.05**		
NOCBO&I	NOCBO&I1	0.763	0.057	13.38**	0.85	0.89
	NOCBO&I2	0.781	0.049	15.93**		
	NOCBO&I3	0.900	0.061	11.47**		
	NOCBO&I4	0.950	0.053	14.15**		
	NOCBO&I5	0.732	0.048	15.25**		
	NOCBO&I6	0.875	0.063	12.30**		
	NOCBO&I7	0.749	0.059	12.69**		
	NOCBO&I8	0.891	0.054	14.64**		
NTS	NTS1	0.764	0.046	16.60**	0.87	0.90
	NTS2	0.829	0.063	11.57**		
	NTS3	0.749	0.045	16.64**		
	NTS4	0.852	0.061	12.32**		
	NTS5	0.870	0.058	13.27**		
	NTS6	0.804	0.060	13.40**		
	NTS7	0.940	0.057	12.98**		
	NTS8	0.773	0.043	17.97**		
NTP	NTP1	0.803	0.048	16.72**	0.89	0.91
	NTP2	0.797	0.053	16.60**		
	NTP3	0.829	0.049	14.87**		
	NTP4	0.948	0.056	12.67**		
	NTP5	0.961	0.043	17.69**		
	NTP6	0.709	0.047	14.46**		
	NTP7	0.985	0.058	13.53**		
PHWE	PHWE1	0.783	0.052	15.05**	0.93	0.95
	PHWE2	0.859	0.061	12.44**		
	PHWE3	0.727	0.049	14.83**		
	PHWE4	0.853	0.051	14.76**		
	PHWE5	0.739	0.057	12.96**		
	PHWE6	0.895	0.063	12.61**		
	PHWE7	0.746	0.059	12.64**		
	PHWE8	0.865	0.047	16.27**		
	PHWE9	0.803	0.055	14.60**		
	PHWE10	0.941	0.045	16.46**		
	PHWE11	0.790	0.050	15.80**		
	PHWE12	0.887	0.048	16.39**		

Note: NAL = Nursing Authentic Leadership, NOCBO&I = Nursing Organizational Citizenship Behavior (Organizational & Individual), NTS = Nursing Task-oriented Performance, NTP = Nursing Technological Support, PHWE = Perception of Hospital work Environment, Significance level: $^{**}p < 0.01$

Table 5 Measurement model

Model	χ^2	Df	χ^2 /df	CFI	TLI	RMSEA	SRMR
5-factor model (NAL, NTP, NOCBO&I, NTS, PHWE)	441.31	263	1.678	0.93	0.87	0.079	0.032
4-factor model (NAL + NTP + NOCBO&I, PHWE)	1130.02	285	3.965	0.91	0.85	0.042	0.079
3-factor model (NAL + NTP, NOCBO&I, NTS, PHWE)	1153.24	299	3.857	0.95	0.89	0.085	0.063
2-factor model (NAL + NTP + NOCBO&I, NTS + PHWE)	2028.50	481	4.342	0.94	0.87	0.093	0.058
1-factor model (NAL + TP + NOCBO&I + NTS + PHWE)	2503.68	489	5.120	0.97	0.95	0.103	0.087

Note: NAL = Nursing Authentic Leadership, NOCBO&I = Nursing Organizational Citizenship Behavior (Organizational & Individual), NTS = Nursing Task-oriented Performance, NTP = Nursing Technological Support, PHWE = Perception of Hospital work Environment

Table 6 Hypothesized relationships (H1- H6)

	Path	β	S.E.	t-value	Bias-Corrected 95% CI		*p*-value
					LLCI	ULCI	
Direct effects							
H1	PHWE → NTP	0.311	0.119	2.613	0.373	0.468	<0.01
H2	PHWE → NTS	0.283	0.114	2.482	0.257	0.439	<0.01
H3	PHWE → NOCBO&I	0.349	0.112	3.116	0.229	0.483	<0.01
Moderating associations							
H4	NAL → NTP	0.185	0.082	2.256	0.165	0.271	<0.01
	PHWE → NTP	0.193	0.089	2.168	0.279	0.351	<0.01
	NAL*PHWE -> NTP	0.191	0.057	3.350	0.171	0.258	<0.01
H5	NAL → NTS	0.138	0.061	2.262	0.245	0.372	<0.01
	PHWE → NTS	0.165	0.073	2.260	0.112	0.261	<0.01
	NAL*PHWE -> NTS	0.123	0.039	3.153	0.295	0.314	<0.01
H6	NAL → NOCBO&I	0.198	0.082	2.390	0.129	0.281	<0.01
	PHWE → NOCBO&I	0.173	0.067	2.582	0.321	0.462	<0.01
	NAL*PHWE -> NOCBO&I	0.272	0.067	4.059	0.170	0.259	<0.01

value according to (α) is 0.70, the most frequently used to check internal consistency. The α for NAL, NOCBO&I, NTS, NTP, and PHWE is 0.95, 0.89, 0.90, 0.91, and 0.95, respectively. According to the Hair [104] and Nguyen, Han [105], the acceptable criterion for factor loading is 0.50. Table 4 shows that the NAL factor loading ranges from 0.962 to 0.713, the OCBO&I factor loading ranges from 0.985 to 0.732, the NTS ranges from 0.940 to 0.749, the NTP ranges from 0.985 to 0.709, and the PHWE ranges from 0.941 to 0.727.

The 5-factor model (NAL, NTP, NOCBO&I, NTS, PHWE) described χ^2 value of 441.31 with 263 degrees of freedom, resulting in a χ^2/df ratio of 1.678 [106]. The Comparative Fit Index (CFI) is 0.93, and the TuckerLewis Index (TLI) is 0.87 [107], supporting the model's acceptability (see Table 5).

In Table 6, hypothesis 1 shows a positive relationship between PHWE and NTP (β = 0.311); that is, higher levels of PHWE are associated with higher levels of NTP. The (β = 0.311, standard error = 0.119), which shows the variability of the coefficient estimate, and (t-value = 2.613, p (< 0.01) 'is statistically significant at 1% level, indicating a significant relationship. Hypothesis 2 also has a significant association between PHWE and NTS, but with a higher β value of 0.283 than that of the processing seed. It also provides statistical significance at the 1% level (t-value = 2.482, p-value = < 0.01). The likely range for the true effect size is a 95% confidence interval (0.257, 0.439). The hypothesis on the PHWE and NOCBO&I relationship (Hypothesis 3) is implemented by running a regression analysis using control variables and finds that PHWE has a positive and statistically significant association with NOCBO&I (β = 0.349, t-value = 3.116, p-value < 0.01). The robustness of this finding is additionally supported by the 95% confidence interval (0.229, 0.483).

Also, H4, H5, and H6 test NAL's role as a moderator between H1, H2, and H3 relationships. Although H4 indicates that NAL positively affects NTP (β = 0.185) and PHWE negatively affects NTP (β = −0.93), this relationship is not evident in H3 (β = 0.028; 0.08 respectively). The interacting term (NAL × PHWE) has a positive coefficient (β = 0.191). Thus, the force of PHWE on NTP, which is statistically significant, becomes more significant when NAL is high. The t-values indicate these

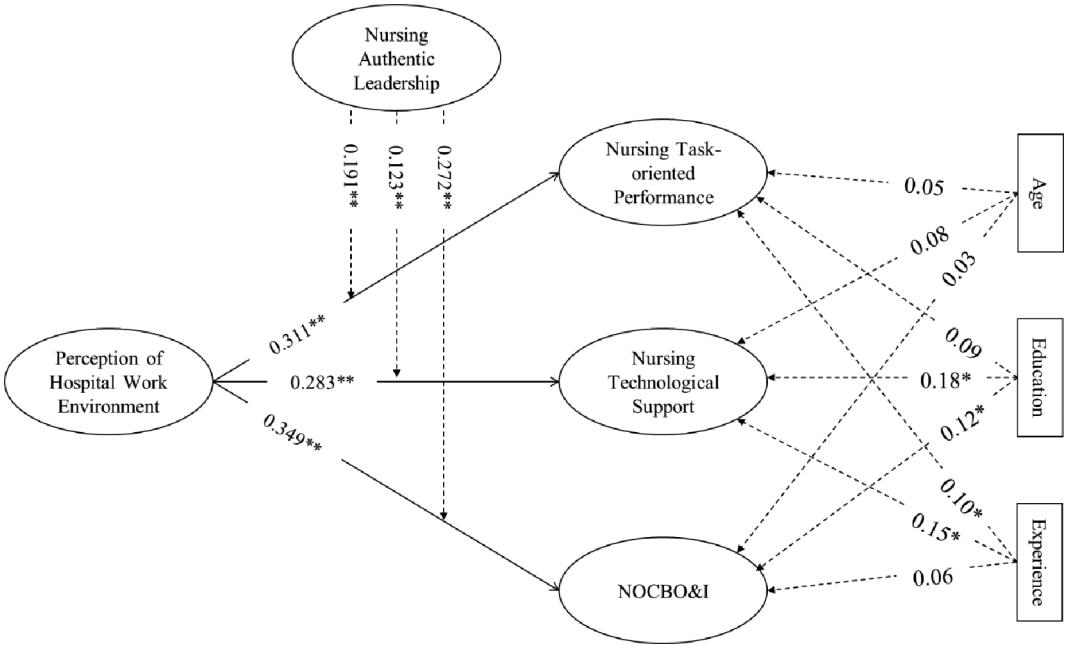

Fig. 2 SEM moderation results

effects' statistical significance and magnitude, as seen in the p-values and confidence intervals.

H5 investigates how NAL affects the relation between PHWE and NTS. The results show the positive effect of NAL on NTS (β = 0.138, t-value = 2.262, p-value < 0.01). Moreover, PHWE shows a positive and statistically significant relationship with NTS (β = 0.165, p-value < 0.01), whereby higher levels of PHWE are associated with higher levels of NTS. The interaction term (NAL × PHWE) also shows a positive and significant coefficient (β = 0.123, p-value < 0.01). This finding suggests that the positive effect of PHWE on NTS becomes more pronounced when NAL levels are higher. In other words, the presence of NAL mitigates the potential negative effects of PHWE on NTS. The 95% confidence interval (0.295, 0.314) provides a range within which the actual effect size of this interaction is likely to fall with 95% confidence (see Table 6).

H6 considers whether the moderating effect of NAL on the relationship between PHWE and NOCBO&I. Findings indicate that NAL has a positive and statistically significant influence on NOCBO&I (β = 0.198, t = 2.390, p = < 0.01) and thus NAL can significantly improve NOCBO&I. PHWE simultaneously has a positive and statistically significant relationship with NOCBO&I (β = 0.173, $p < 0.01$) which implies that a higher level of PHWE can contribute to better NOCBO&I duties. In addition, the coefficient of the interaction term (NAL × PHWE) is statistically significant with (β = 0.272) and (p-value < 0.01. It indicates that when NAL is high, the nursing work environment in hospitals influences

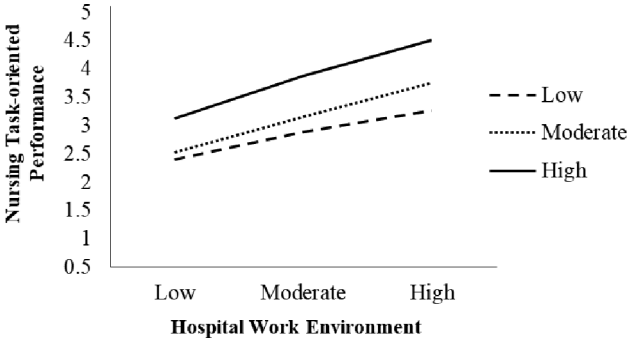

Fig. 3 NAL moderates the positive relationship between PHWE and NTP

NOCBO&I. The actual effect size of this interaction is likely to be within the range of 0.170 to 0.259 at the 95% confidence interval. Hypotheses H1 to H6 relationships are depicted in Table 6; Fig. 2. The diagrams illustrating the moderation effect are also shown in Figs. 3 and 4, and 5.

Discussion

Understanding the relationship between perceptions of the working hospital environment and nursing task-oriented performance, technological support, and organizational citizenship behavior (OCB) is crucial in determining the impact of hospital work environments on nursing outcomes. Based on previous research, a comprehensive discussion of the importance and significance of these associations follows. Research indicates that a positive perception of the hospital's working environment enhances nursing task-oriented performance.

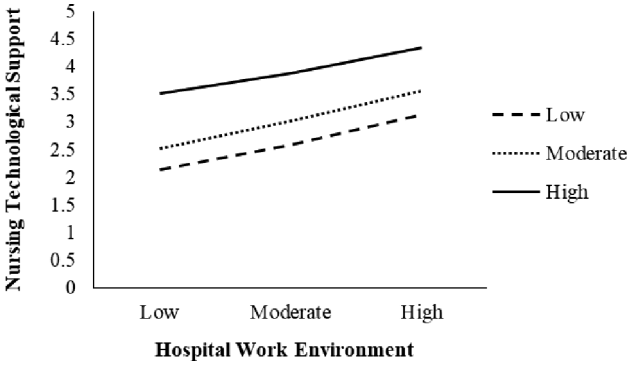

Fig. 4 NTL moderates the positive relationship between PHWE and NTS

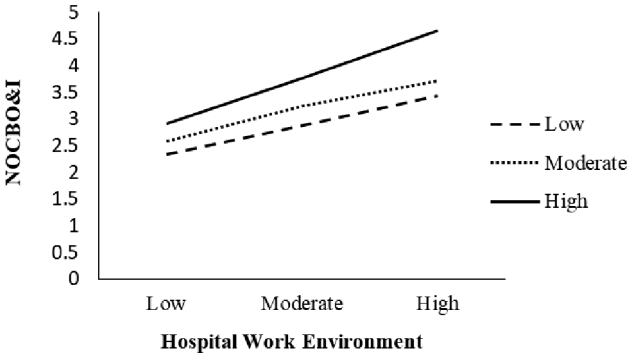

Fig. 5 NTL moderates the positive relationship between the PHWE and NOCBO&I

A supportive environment reduces stress and burnout, enabling nurses to perform their work more effectively in patient care and clinical tasks [108, 109]. For example, proper staffing, suitable workloads, and effective team dynamics have been shown to enhance nurses' ability to carry out tasks efficiently and effectively [110].

Additionally, job satisfaction, which is strongly related to enhanced task performance, is a positive outcome associated with a positive work environment [111]. Nevertheless, it has been argued that such a relationship may be moderated by individual or organizational constraints and/or resilience. For instance, in situations where the environment is not resource-rich, even a positive perception of the environment might not lead to improved performance in a task due to systemic inefficiencies [112]. In this sense, the association is generally significant but is not necessarily true for all contexts.

When employees perceive the working environment positively, they have better access to and use technological support. Hospitals with strong environments tend to invest in advanced technologies and training since this boosts nurses' incorporation capabilities in technology workflows [36, 113]. According to Allana [114] studies have demonstrated that nurses working in such environments feel better about using technology to improve patient care and reduce errors. However, the relationship may be insignificant if technological systems are not implemented well or nurses observe them as intrusive rather than supportive [115]. For instance, introducing technology without appropriate training or considering workflow requirements will generate frustration and resistance, eventually ruining all the benefits of a successful work environment [116]. The association is derived from the quality and usability of the installed technological systems.

A positive perception of the hospital environment is associated with individual and organizational OCB [117]. Nurses working in a supportive climate tend to carry out 'extra' work behaviors going beyond the formal job requirement, i.e., helping colleagues, volunteering for extra duties, and enhancing the positive organizational culture [118]. According to research, leadership support, recognition, and the feeling of belonging are essential motivators in nursing OCB [119]. However, this association may not exist where nurses are burdened or underrecognition. Such examples indicate that, even if nurses' perception of the environment is generally positive, they may be too exhausted and disengaged to engage in OCB [120]. In addition, organizations' policies that contradict the encouragement of discretionary efforts may be a reason for weakening this relationship [121].

The study has generally supported the hypotheses by emphasizing the positive role of the hospital working environment in nursing performance, technological support, and OCB. However, the strength and importance of these relationships depend on contextual factors, such as resource availability, implementation quality, and individual or organizational constraints. The moderation relationship of authentic leadership in the relationship between the perception of the hospital working environment and task-oriented performance was positively moderated. The presence of authentic leaders and open, ethical, and concerned leaders among employees spur a respect-based environment with the potential to facilitate the effective completion of nurses' tasks [122]. According to studies, authentic leadership leads to psychological safety that entails nurses concentrating on their responsibilities without fear of consequences [123]. For example, it is understood that nurses perceive their leaders as authentic, which leads nurses to feel supported and motivated, improving task performance [70]. Yet, given the nature of the interactions between leadership and these factors, it is possible that the moderating effect may not be significant in situations characterized by systemic problems, for instance, chronic understaffing or resource shortages, in which the impact of leadership may be negligible. In that case, even very authentic leaders can fail to boost the efficiency of task-oriented performance because of structural constraints [124]. Further, nurses might perceive a gap between authentic leadership and

what it is really acting on, and consequently moderate the impact of these factors [82].

The perception of the hospital working environment and technological support has a positive relationship that can be moderated by authentic leadership. However, to achieve the adoption of user-friendly technologies, more than likely, authentic leaders will advocate for and facilitate the adoption of such technologies [125], and nurses will get adequate training and support [36]. Similarly, a study investigates how authentic leadership influences employee innovation and work engagement within the context of digital transformation. The results imply that authentic leadership positively influences employees' innovative behaviors, and digital transformation moderates this relationship, increasing authentic leadership's positive effects on innovation and engagement [126]. Additionally, research examines authentic leadership in the IT industry and its influence on creating and fostering a work environment. The paper concludes that authentic leadership behaviors are key to employee vitality and learning, the two factors necessary for thriving at work, especially in industries with high technology [26]. Moreover, a study's outcomes show that authentic leadership has positive effects on inventive behavior, indicating that honest and clear leaders can make a workplace favorable for progress [127].

It was found that the perception of the hospital working environment strongly moderates the relationship between authentic leadership and OCB. Nurses working under authentic leaders will likely be more prosocial, including helping colleagues, volunteering for additional assignments, and contributing to a positive organizational culture [128]. This is especially important in healthcare settings because teamwork and collaboration are absolutely key to patient outcomes [129]. A previous study indicated that authentic leaders reduce POP's negativism by encouraging open communication and mutual support, which builds working relationships that discourage self-serving behaviors and enhance transparency [130]. Similarly, research examines how authentic leadership can mediate the negative effects of the perceived organizational environment on OCB. The results indicate that authentic leadership moderates this relationship with organizational politics and environment, dampening its negative impact on employees' citizenship behaviors [131].

Conclusion

This study demonstrates the essential relationship between the perception of the hospital working environment, authentic leadership, and nursing outcomes concerning task-oriented performance, technological support, and organizational citizenship behavior (OCB) in the setting of public sector hospitals in Shandong Province, China. Simpler research indicates the need to create a good hospital working environment that will increase nursing performance, make it easy to adopt technological tools, and promote prosocial behaviors among nurses. However, authentic leadership as a moderator plays a complex role in the relationships of these dynamics, especially in the specific healthcare context of Shandong Province.

As Shandong Province experiences rapid modernization of the healthcare systems with increasing demands, integrating technology into nursing practice is becoming more and more vital. Positive perception of the working environment and authentic leadership increase the nurses' easy access to and use of technological devices. Bridging technological advancements with nursing workflows would be authentic leaders who advocate user-friendly technologies and provide adequate training [36, 132]. Teamwork and collaboration are needed to manage high patient loads, which makes Shandong Province a good place for nurses' OCB to experience an authentic leadership effect on job performance. Nurses working for leaders who encourage trust and commitment are motivated to engage in extra-role behaviors for the benefit of the organization, such as helping co-workers and promoting a positive hospital environment.

Implications

Therefore, hospital administrators in Shandong Province must emphasize the development of authentic leadership skills by nurse managers and senior leaders to improve the nursing work environment and outcomes. Focusing training programs on promoting transparency, empowering employees, and ethical decision-making can increase leaders' capacities to develop nurse-friendly work environments and improve nursing. Hospitals need to ensure that technological advances are as advantageous as possible by making their new devices easy to use and corresponding to nurses' workflows. Processes for implementing technology should occur with the active involvement of authentic leaders who serve as trainers and supportive agents who address nurse concerns and create a culture of technological acceptance.

Under limited resources, authentic leadership acts as a buffer to negate some of the adverse effects of resource constraints; however, the issue of understaffed and inadequately funded pushes to the policy level for prompt resolution. Second, provincial healthcare authorities should allocate resources to improve the public hospitals' working conditions so that nurses can effectively perform their duties and engage in OCB. The government can advocate for hospital policies to acknowledge and honor nurses' discretionary efforts and promote a culture where collaboration with mutual support is sustained. Even an authentic leader can play a key role in promoting such

initiatives in which nurses feel valued and/or motivated to contribute to organizational success.

Theoretical implications

This study offers several significant theoretical contributions, advancing our understanding of authentic leadership, organizational behavior, and the role of technological support in healthcare settings. First, by integrating social exchange theory and conservation of resources theory, this research extends existing leadership theories to healthcare, particularly in public sector hospitals. While SET traditionally explains leader-follower interactions through reciprocity, this study demonstrates how authentic leadership fosters high-quality exchanges that promote nursing task-oriented performance and organizational citizenship behaviors.

The research addresses a knowledge gap by exploring how leaders enhance the availability of nursing resources in their work environments. This study contributes to COR Theory by demonstrating that authentic leadership is a protective factor, mitigating the adverse effects of stressful medical settings. It offers fresh insights into how effective leadership can promote workforce well-being and enhance organizational outcomes by preserving staff's emotional and professional assets. The study shows how technology assists nurses in managing workload demands, enabling them to maintain their performance and health even when resources are limited. Additionally, this research enhances the field of authentic leadership by exploring how technological support benefits healthcare leaders.

Prior research has examined the effectiveness of leadership in traditional settings; however, this study explores how technology fosters the development of authentic leadership and enables leaders to navigate environmental challenges. It presents a fresh perspective by integrating technological support with authentic leadership, demonstrating that leadership styles and technological advancements are interconnected and can work together to achieve positive outcomes in complex, resource-intensive environments. This research provides essential insights for future studies on resource management in healthcare organizations. It allows healthcare leaders to examine resource preservation behaviors and their interaction with technology in workplace leadership practices. The findings lay the groundwork for developing models integrating human leadership interactions with digital AI healthcare solutions and other relevant factors.

Future research directions

Future research must go beyond naming regional factors and critically analyze the relationship between authentic leadership and nursing outcomes related to healthcare policies, culture, and economic disparities within Shandong Province, PRC. However, merely suggesting these factors without analyzing how they can potentially moderate their influence shortens the study's theoretical contribution. Investigating these boundary conditions more systematically would lead us to a richer, more context-sensitive understanding of leadership dynamics in healthcare. The recommendation for longitudinal research needs additional explanation to be practical.

Research must follow multiple time points to study how authentic leadership affects developing jobs and responds to organizational improvements and healthcare system updates. This study design would provide better results and bring a fresh understanding of effective leadership practices. The final premise that authentic leadership and positive workplaces advance healthcare delivery are over-reductive. Future studies should identify and test specific mediators (job satisfaction, burnout, psychological safety, and professional commitment) that explain how and why the improvements are observed. A more rigorous examination of these mechanisms would place the study within a broader theoretical framework, strengthen its scholarly contribution, and provide more constructive implications for leadership theory and health care practice.

Abbreviations

NAL	Nursing authentic leadership
HWE	Hospital working environment
NTOP	Nurses' task-oriented performance
NTS	Nurses' technological support
OCBO&I	Organizational citizenship behavior, both organizational and individual
NOCBO&I	Nurses' organizational citizenship behavior, both organizational and individual
SET	Social Exchange Theory
SLT	Social Learning Theory
COR	Conservation of Resources Theory

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12912-025-03173-y.

Supplementary Material 1

Acknowledgements

The authors wish to acknowledge the assistance of the participants from the China Health Association who were involved in the study.

Author contributions

AH and WR: conceptualization. AH, SK, AJ, WR, and SC: methodology, writing, investigation, and coding analysis. AH, AJ, SK, and SC: data collection. All authors contributed directly to the article and approved it for publication.

Funding

Youth Innovation Team Development Plan for Universities in Shandong Province (2022KJ339).

Data availability

The authors will make the raw data supporting this article's conclusions available without undue reservation.

Declarations

Ethics approval and consent to participate
This study was approved by the Ethics Committee of Jiangsu University, Zhenjiang, China (No. 2379 HREC/2024), in accordance with the principles outlined in the Declaration of Helsinki. Participants were informed about the study's objectives and were free to withdraw at any time. All collected data were anonymized and handled with strict confidentiality, adhering to ethical guidelines. Informed consent was obtained from all participants.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

Received: 20 February 2025 / Accepted: 6 May 2025
Published online: 19 May 2025

References

1. Epitropaki O, et al. Leadership and followership identity processes: A multilevel review. Leadersh Q. 2017;28(1):104–29.
2. Cengiz Ucar A, Alpkan L, Elci M. The effect of servant and transformational leadership styles on employee creative behavior: the moderating role of authentic leadership. Int J Organizational Leadersh. 2021;10:99–119.
3. Batista SA, et al. Authentic leadership, nurse satisfaction at work and hospital accreditation: study in a private hospital network. Revista Brasileira De Enfermagem. 2021;74(2):e20200227.
4. Kensler PA. Authentic leadership, relationships between nurse team members and leaders, perception of stress, and intent to stay and intent to leave. Louisiana State University Health Sciences Center; 2024.
5. Almutairi M, et al. Authentic leadership—A concept analysis. Journal of Advanced Nursing; 2024.
6. Wijaya D, Supriyanto S, Yusuf A. Organisational citizenship behaviour (OCB) model in hospital nurses in Indonesia. Malaysian Journal of Medicine & Health Sciences; 2023. p. 19.
7. Tsai J-C, Chang W-P. The mediating effect of job satisfaction on the relationship between workplace bullying and organizational citizenship behavior in nurses. Work. 2022;72(3):1099–108.
8. Mohammadi F, Rustaee S, Bijani M. The factors influencing patient safety management as perceived by emergency department nurses: A qualitative study. Nurs Open. 2024;11(3):e2135.
9. Noor N, Rehman S, Gull M. Determinants of Work-Related stress among nursing professionals. Pakistan J Humanit Social Sci. 2023;11(2):1836–49.
10. Thompson N. Authentic leadership revisited: an existentialist approach. Edward Elgar Publishing; 2024.
11. Kilroy J, Dundon T, Townsend K. Embedding reciprocity in human resource management: a social exchange theory of the role of frontline managers. Hum Resour Manage J. 2023;33(2):511–31.
12. Chen JK, Sriphon T. The relationships among authentic leadership, social exchange relationships, and trust in organizations during COVID-19 pandemic. Adv Decis Sci. 2022;26(1):1–37.
13. Elshikh M. Mitigating Burnout: Identifying Risk Factors and Effective Strategies for Enhancing Nurses' Well-Being. 2024.
14. Bandura A. Social learning theory (SLT). Department of Psychology. 1977.
15. Duprez V, et al. Understanding strategies that foster nurses to act as clinical leaders in hospitals: a realist review. J Adv Nurs. 2024;80(4):1248–61.
16. Zhang C, et al. How does ethical leadership influence nurses' job performance? Learning goal orientation as a mediator and co-worker support as a moderator. Nurs Ethics. 2024;31(4):406–19.
17. Ossenberg C, et al. Nurses' Perceptions of the Relevance of Their Role and Responsibilities for Adopting Evidence-Based Feedback Into Practice: An Implementation Study. Journal of Advanced Nursing; 2025.
18. Teo S, Lux A, Pick D. Authentic leadership and psychological well-being of nurses: A mediated moderation model. J Nurs Adm Manag. 2023;2023(1):7593926.
19. Chen G, et al. Social support, psychological capital, multidimensional job burnout, and turnover intention of primary medical staff: a path analysis drawing on conservation of resources theory. Hum Resour Health. 2024;22(1):42.
20. Xerri MJ, Cozens R, Brunetto Y. Catching emotions: the moderating role of emotional contagion between leader-member exchange, psychological capital and employee well-being. Personnel Rev. 2023;52(7):1823–41.
21. Chamisa SF, Mjoli TQ, Mhlanga TS. Psychological capital and organisational citizenship behaviour in selected public hospitals in the Eastern cape Province of South Africa. SA J Hum Resource Manage. 2020;18:12.
22. Tran HP. How authentic leadership promotes individual knowledge sharing: viewing from the lens of COR theory. Volume 14. Management & Marketing; 2019. 4.
23. Alomar A, Mydin AA, Alaklabi S. A review of authentic leadership and workplace spirituality & campus sustainability in educational institutions. Int Trans J Eng Manage Y Appl Sci Y Technol. 2022;13(2):1–13.
24. Mansouri H, et al. The influences of authentic leadership, meaningful work, and perceived organizational support on psychological well-being of employees in sport organizations. J Global Sport Manage. 2024;9(3):575–98.
25. Abbas A, et al. Positive leadership psychology: authentic and servant leadership in higher education in Pakistan. Curr Psychol. 2022;41(9):5859–71.
26. Durrah O, et al. Authentic leadership behaviors and thriving at work: empirical evidence from the information technology industry in Australia. Psychol Rep. 2024;127(4):1911–40.
27. Zubair A, Kamal A. Perceived authentic leadership, psychological capital, and creative work behavior in bank employees. Pakistan J Psychol Res, 2017. 32(1).
28. Reinhardt AC, Leon TG, Summers LO. The transformational leader in nursing Practice–an approach to retain nursing staff. Administrative Issues J. 2022;12(1):2.
29. Zhang L, et al. The relationship between transformational leadership and work engagement among intensive care unit nurses: the mediating function of organizational climate. BMC Nurs. 2025;24(1):1–11.
30. Ng L-P, et al. Job satisfaction and organizational citizenship behaviour amongst health professionals: the mediating role of work engagement. Int J Healthc Manag. 2021;14(3):797–804.
31. Kohanová D, Solgajová A, Cubelo F. The association of teamwork and missed nursing care in acute care setting: a mixed-methods systematic review. J Clin Nurs. 2024;33(9):3399–413.
32. Alilyyani B, Wong CA, Cummings G. Antecedents, mediators, and outcomes of authentic leadership in healthcare: A systematic review. Int J Nurs Stud. 2018;83:34–64.
33. Marques-Quinteiro P, et al. On the relationship between authentic leadership, flourishing, and performance in healthcare teams: a job demands-resources perspective. Front Psychol. 2021;12:692433.
34. Bourgault AM. Task-oriented nursing care through a positive lens. 2023, American Association of Critical Care Nurses. pp. 7–9.
35. Webster NL, et al. Using technology to support the emotional and social well-being of nurses: A scoping review. J Adv Nurs. 2020;76(1):109–20.
36. Hussain A, et al. The mediating effects of perceived usefulness and perceived ease of use on nurses' intentions to adopt advanced technology. BMC Nurs. 2025;24(1):33.
37. Li Z, et al. Challenge-Oriented organizational citizenship behaviors among nurses: the influence of perceived inclusive leadership and organizational justice in High-Intensity work environment. J Nurs Adm Manag. 2024;2024(1):3032694.
38. Ali Nisar Q, et al. Cost of organizational citizenship behaviors: serial mediation model of citizenship fatigue. Manage Res Rev. 2024;47(6):904–27.
39. Greenslade JH, Jimmieson NL. Distinguishing between task and contextual performance for nurses: development of a job performance scale. J Adv Nurs. 2007;58(6):602–11.
40. Teo T, Lee CB. Explaining the intention to use technology among student teachers: an application of the theory of planned behavior (TPB). Campus-Wide Inform Syst. 2010;27(2):60–7.
41. Arifin S, Narmaditya BS. Fostering employee performance of civil servants in Indonesia: the mediating role of organisational citizenship behaviour. SA J Hum Resource Manage. 2024;22:2412.
42. Kiranmayi GR, et al. Examining organizational justice, psychological well-being, and citizenship behaviors in the Indian banking sector: a mediation analysis. In: Organization, purpose, and values. Routledge; 2024. p. 114–28.
43. Morvati D, et al. Nurses' and nurse leaders' perspectives on a health-promoting work environment: a meta-ethnographic study. Int J Qual Stud Health Well-Being. 2025;20(1):2460255.
44. Bindayel MA. Innovation leadership and employee behaviours in nurse recruitment in Saudi Arabian hospitals: A qualitative study. Cardiff University; 2022.

45. Dong S, et al. Workplace violence, psychopathological symptoms, and deviant workplace behavior among nursing interns in China: a network analysis. BMC Nurs. 2025;24(1):129.
46. Ferede AJ, et al. Nurses' perceptions of caring behaviors at referral hospitals in Ethiopia: A mixed-methods approach. BMC Nurs. 2024;23(1):1–11.
47. Oducado RMF. Quality health care and nursing. 2019.
48. Tran QHN. Exploring relationships among leadership behaviors, organizational citizenship behaviors, organizational justice and person–organization fit in Vietnamese academic libraries. The Learning Organization; 2024.
49. Lerio RR, Bandiola AN. Work environment, human resource practices, and organizational culture: A causal model on service quality of employees in government agency in Davao region. Am J Public Policy Adm. 2023;8(3):1–33.
50. Delaney CW et al. Nursing and Informatics for the 21st Century-Embracing a Digital World, Book 1: Realizing Digital Health-Bold Challenges and Opportunities for Nursing. 2022.
51. Baporikar N. Role of Information Technology in Enhancing Healthcare Services, in Digital Technologies for a Resource Efficient Economy. 2024, IGI Global. pp. 63–87.
52. Alilyyani B, et al. Nursing experience and leadership skills among staff nurses and intern nursing students in Saudi Arabia: a mixed methods study. BMC Nurs. 2024;23(1):87.
53. Fan S, et al. The role of the nursing work environment, head nurse leadership and presenteeism in job embeddedness among new nurses: a cross-sectional multicentre study. BMC Nurs. 2024;23(1):159.
54. Yusuf Z, et al. Assessing organizational commitment and organizational citizenship behavior in ensuring the smoothness of the supply chain for medical hospital needs towards a green hospital: evidence from Indonesia. Uncertain Supply Chain Manage. 2024;12(1):181–94.
55. Bakeer HM, Nassar RA, Sweelam RKM. Investigating organisational justice and job satisfaction as perceived by nurses, and its relationship to organizational citizenship behaviour. Nurs Manag, 2024. 31(5).
56. Lee K, Jun HS. The mediating effects of perceived organizational support and perceived supervisor support in the relationship between clinical nurses' organizational citizenship behavior and turnover intention. J Korean Acad Nurs Adm. 2024;30(1):11–8.
57. Youn S, Geismar HN, Pinedo M. Planning and scheduling in healthcare for better care coordination: current understanding, trending topics, and future opportunities. Prod Oper Manage. 2022;31(12):4407–23.
58. Nurkholis N, et al. Power dynamics in Accounting-Related strategic Decision-Making within hospital management: A narrative literature review. Jurnal Akuntansi Manado (JAIM); 2024. pp. 133–42.
59. Luger S, Koziol D. Authentic nursing leadership theory and nurse leaders' stories: storytelling workshop impact on nurse leader burnout. Nurs Manag. 2024;55(5):22–7.
60. Moore AON. Leaders' perceived value of leadership competencies in healthcare organizations participating in mergers and acquisitions. The University of Mississippi Medical Center; 2024.
61. Muirhead L, et al. Using an organizational framework to drive change in nursing education: an action plan for nurse leaders. Nurs Outlook. 2025;73(1):102313.
62. Chakraborty S, Kaynak H, Pagan JA. Bridging hospital quality leadership to patient care quality. Int J Prod Econ. 2021;233:108010.
63. Labrague LJ, et al. Authentic leadership, nurse-assessed adverse patient events and quality of care: the mediating role of nurses' safety actions. J Nurs Adm Manag. 2021;29(7):2152–62.
64. Settoon RP, Bennett N, Liden RC. Social exchange in organizations: perceived organizational support, leader–member exchange, and employee reciprocity. J Appl Psychol. 1996;81(3):219.
65. Ahmad R, et al. Social exchange theory: systematic review and future directions. Front Psychol. 2023;13:1015921.
66. Allgood A. Erosion Of Trust In Healthcare Leadership: An Analysis Of Anomie And Social Exchange During The Covid-19 Pandemic. 2024.
67. Trybou J, et al. The importance of social exchange to nurses and nurse assistants: impact on retention factors. J Nurs Adm Manag. 2014;22(5):563–71.
68. Mirzaei A, et al. The relationship of perceived nurse manager competence with job satisfaction and turnover intention among clinical nurses: an analytical cross-sectional study. BMC Nurs. 2024;23(1):528.
69. Huang N et al. Ethical leadership and organizational citizenship behavior: mediation of trust and psychological well-being. Psychol Res Behav Manage, 2021: pp. 655–64.
70. Pattali S, et al. Effect of leadership styles on turnover intention among staff nurses in private hospitals: the moderating effect of perceived organizational support. BMC Health Serv Res. 2024;24(1):199.
71. Lartey SA, et al. Leadership self-efficacy and nurses' aspiration to leadership: an evolutionary concept analysis. Int J Nurs Stud. 2023;143:104496.
72. Hobfoll SE. Conservation of resources: a new attempt at conceptualizing stress. Am Psychol. 1989;44(3):513.
73. Khan MA. Linking organizational cronyism, time theft and Nurse's proactive behavior: an evidence from public sector hospitals of Pakistan. Int J Health Care Qual Assur. 2024;37(1/2):1–23.
74. Alvaro Cervilla LO. Influence of nurses' organizational citizenship behaviors and empowerment on the quality of care: A literature review. 2018.
75. Wu W-L, Lee Y-C. Do work engagement and transformational leadership facilitate knowledge sharing? A perspective of conservation of resources theory. Int J Environ Res Public Health. 2020;17(7):2615.
76. Hobfoll S. Conservation of resources theory: applications to stress and management in the workplace. Handbook of organization behavior (2nd revised edition)/Dekker, 2000.
77. Asim M, et al. Abusive supervision and helping behavior among nursing staff: a moderated mediation model. J Health Organ Manag. 2024;38(5):724–40.
78. Lee S, Na C. Public service motivation and job satisfaction amid COVID-19: exploring the effects of work environment changes. Public Personnel Manage. 2024;53(2):281–308.
79. Müller A, et al. The age-related effect of job autonomy on depressive symptoms through selective optimization with compensation: A two-wave panel study. Work Aging Retire. 2017;3(4):379–92.
80. Felder M, et al. Job crafting as retention strategy: an ethnographic account of the challenges faced in crafting new nursing roles in care practice. Int J Health Plann Manag. 2024;39(3):722–39.
81. Dickson CA, et al. Leadership practices that enable healthful cultures in clinical practice: A realist evaluation. J Clin Nurs. 2024;33(3):982–97.
82. YILDIRIM D, BAHÇECİK AN. Nurses' Authentic Leadership Perceptions and Organizational Trust Levels: A Correlation and Cross-Sectional Study. Turkiye Klinikleri J Nurs Sci, 2024. 16(3).
83. Srivastava AP, Dhar RL. Authentic leadership and extra role behavior: A school based integrated model. Curr Psychol. 2019;38:684–97.
84. Ayça B. The impact of authentic leadership behavior on job satisfaction: A research on hospitality enterprises. Procedia Comput Sci. 2019;158:790–801.
85. Mrayyan MT, et al. Nurses' authentic leadership and their perceptions of safety climate: differences across areas of work and hospitals. Leadersh Health Serv. 2022;35(3):372–89.
86. Kaya B, Karatepe OM. Does servant leadership better explain work engagement, career satisfaction and adaptive performance than authentic leadership? Int J Contemp Hospitality Manage. 2020;32(6):2075–95.
87. Kurian D, Nafukho FM. Can authentic leadership influence the employees' organizational justice perceptions?–a study in the hotel context. Int Hospitality Rev. 2022;36(1):45–64.
88. Sui Y, et al. Exploring the dynamic equilibrium relationship between urbanization and ecological environment–A case study of Shandong Province, China. Ecol Ind. 2024;158:111456.
89. Saunders M. Research methods for business students. Person Education Limited; 2009.
90. Krejcie R. Determining sample size for research activities. Educational Psychol Meas; 1970.
91. Walumbwa FO, et al. Authentic leadership: development and validation of a theory-based measure. J Manag. 2008;34(1):89–126.
92. Datta B. Assessing the effectiveness of authentic leadership. Int J Leadersh Stud. 2015;9(1):62–75.
93. Lee K, Allen NJ. Organizational citizenship behavior and workplace deviance: the role of affect and cognitions. J Appl Psychol. 2002;87(1):131.
94. Zhao P, et al. The validation and application of the C Hinese version of perceived nursing work environment scale. J Clin Nurs. 2013;22(13–14):1827–32.
95. Kanwel S, et al. The influence of hospital services on patient satisfaction in OPDs: evidence from the transition to a digital system in South Punjab, Pakistan. Volume 22. Health Research Policy and Systems; 2024. p. 93. 1.
96. Hussain A, et al. Exploring sustainable healthcare: innovations in health economics, social policy, and management. Heliyon; 2024.
97. Hussain A, et al. Antecedents of patient loyalty: exploring mediating and moderating paradigms in public hospitals. Patient preference and adherence; 2025. pp. 527–42.

98. Al Mansoori SANA, et al. Strategic management planning and the development of healthcare sector in Abu Dhabi: structural equation modeling (SEM) approach. European Journal of Social Sciences Studies; 2018.
99. Singh S, et al. Determinants of health system efficiency in middle-east countries-DEA and PLS-SEM model approach. Int J Syst Assur Eng Manage. 2024;15(5):1815–27.
100. Saedpanah K, et al. Effects of workload and job stress on the shift work disorders among nurses: PLS SEM modeling. Eur J Translational Myology. 2022;33(1):10909.
101. Nunnally J, Bernstein I. Psychometric theory, 3rd edn., internat. stud. ed.,[Nachdr.]. McGraw-Hill Series in Psychology. Tata McGraw-Hill Ed, New Delhi, 2010.
102. Mashayekh R, et al. The effect of the preceptorship training program on the participation of clinical nurses in training nursing internship students: a quasi-experimental study. BMC Nurs. 2024;23(1):395.
103. Shaheen F, et al. Structural equation modeling (SEM) in social sciences & medical research: a guide for improved analysis. Int J Acad Res Bus Social Sci. 2017;7(5):132–43.
104. Hair JF. Multivariate data analysis. 2009.
105. Nguyen TVT, et al. The bookstore-café: emergence of a new lifestyle as a third place in Hangzhou, China. Space Cult. 2019;22(2):216–33.
106. Bentler PM, Chou C-P. Practical issues in structural modeling. Sociol Methods Res. 1987;16(1):78–117.
107. Kline RB. Principles and practice of structural equation modeling. Guilford; 2023.
108. Wei H, et al. The state of the science of nurse work environments in the united States: A systematic review. Int J Nurs Sci. 2018;5(3):287–300.
109. Liu X, et al. Hospital nursing organizational factors, nursing care left undone, and nurse burnout as predictors of patient safety: A structural equation modeling analysis. Int J Nurs Stud. 2018;86:82–9.
110. Griffiths P, et al. Nursing workload, nurse staffing methodologies and tools: A systematic scoping review and discussion. Int J Nurs Stud. 2020;103:103487.
111. Fan S, et al. The role of the nursing work environment, head nurse leadership and presenteeism in job embeddedness among new nurses: a cross-sectional multicentre study. BMC Nurs. 2024;23(1):159.
112. Anas M, et al. Moving towards sustainable environment development in emerging economies: the role of green finance, green tech-innovation, natural resource depletion, and forested area in assessing the load capacity factor. Sustain Dev. 2024;32(4):3004–20.
113. Cachata D, et al. The integration of information technology in the management and organization of nursing care in a hospital environment: A scoping review. Int J Environ Res Public Health. 2024;21(8):968.
114. Allana S. Investigating Technology Implementation in a Canadian Community Hospital. 2024.
115. Ramadan OME, et al. Facilitators and barriers to AI adoption in nursing practice: a qualitative study of registered nurses' perspectives. BMC Nurs. 2024;23(1):891.
116. De Leeuw JA, Woltjer H, Kool RB. Identification of factors influencing the adoption of health information technology by nurses who are digitally lagging: in-depth interview study. J Med Internet Res. 2020;22(8):e15630.
117. Ningsih LK, Prastiwi NLPEY. Improving the performance of hospital employees reviewed from the perspective of organizational culture, organizational citizenship behavior, and organizational commitment. Int J Social Sci Bus. 2022;6(1):39–46.
118. Khajoei R, Jokar M, Vasli P. Nurses' experiences of the attributes of the organizational citizenship behavior: a qualitative content analysis. BMC Health Serv Res. 2024;24(1):538.
119. Akgerman A, Gül D, Sönmez B. The relationship between inclusive leadership, organizational justice, work engagement and organizational citizenship behavior in healthcare workers. Leadership in Health Services; 2024.
120. Dixon D. Examining burnout, leader member exchange quality, experience and OCB in registered nurses. Northcentral University; 2021.
121. Torlak NG, et al. Links connecting nurses' planned behavior, burnout, job satisfaction, and organizational citizenship behavior. J Workplace Behav Health. 2021;36(1):77–103.
122. Birnbaum A. True Connections: High-Quality Connections in a Post-COVID-19 Landscape. 2023.
123. Coxen L, Van der Vaart L, Stander MW. Authentic leadership and organisational citizenship behaviour in the public health care sector: the role of workplace trust. SA J Industrial Psychol. 2016;42(1):1–13.
124. Alhussin EM, et al. Patients' satisfaction with the quality of nursing care: a cross-section study. Int J Afr Nurs Sci. 2024;20:100690.
125. Lin Q. How does authentic leadership drive hotel employees to Innovate?? A cross-level influencing process. Int J Hospitality Manage. 2024;123:103890.
126. Zhang H, Li X, Li Y. The impact of authentic leadership on employee innovation behavior and work engagement in specialized, fined, peculiar and innovative SMEs. Open J Bus Manage. 2022;11(1):238–59.
127. Laguna M, et al. Authentic leadership and employees' innovative behaviour: a multilevel investigation in three countries. Int J Environ Res Public Health. 2019;16(21):4201.
128. Laschinger HKS, Grau AL. The influence of personal dispositional factors and organizational resources on workplace violence, burnout, and health outcomes in new graduate nurses: A cross-sectional study. Int J Nurs Stud. 2012;49(3):282–91.
129. Maziero VG, et al. Positive aspects of authentic leadership in nursing work: integrative review. Revista Brasileira De Enfermagem. 2020;73(6):e20190118.
130. Gardner WL, et al. Authentic leadership theory: the case for and against. Leadersh Q. 2021;32(6):101495.
131. Asif M, et al. Authentic leadership: bridging the gap between perception of organizational politics and employee attitudes in public sector museums. Humanit Social Sci Commun. 2025;12(1):1–12.
132. Doherty DP, Hunter SM, Revell. Developing nurse leaders: toward a theory of authentic leadership empowerment. In Nursing forum. Wiley Online Library; 2020.

Publisher's note