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Role of Ambidextrous Leadership in Enhancing Work Engagement and Organizational Performance.

Waseem Rafiq, *Department of Management Sciences, Alhamd Islamic University, Islamabad, Pakistan*
Noheed Khan*, *Department of Management Sciences, Alhamd Islamic University, Islamabad, Pakistan*

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ABSTRACT

This empirically examined the role of ambidextrous leadership on employees' work engagement and organizational performance. Ambidextrous leadership encompasses a leader's capability to stimulate exploitative and explorative activities in employees. A cross-sectional survey was developed, and data were gathered through convenience sampling of N=258 health professionals from government and private sector hospitals from main cities in Pakistan with a condition to have COVID emergency response centers in them so that pressure and crisis management experience must be there in the population of study. The study's conceptual model was analyzed through structural equation modeling partial least squares with SmartPLS 3 software. Mediation by bootstrap was used to analyze the indirect relationships. Results Ambidextrous leadership was found to have a direct impact on both work engagement (β = 0.236) and organizational performance (β = 0.395). The direct relationship between ambidextrous leadership and employee creativity was nonsignificant. However, the relationships between ambidextrous leadership and work engagement and organizational performance were both mediated by High performance work systems. Finally, the results reveal that organizational performance mediated the relationship between high performance work system and work engagement. The results show that ambidextrous leadership and high performance work system promote the overall performance of health professionals. Thus, a practical implication is that health-care organizations should recruit, train, and develop their leaders to become ambidextrous leaders, in addition to being aware of the multiple direct and indirect effects of practicing ambidextrous leadership.

*Corresponding author: noheed_khan@yahoo.com

INTRODUCTION

The healthcare system in Pakistan is confronted with multiple challenges that hinder its ability to deliver equitable and effective medical care. Key issues include disparities between public and private healthcare services, with public hospitals often lacking essential services and private healthcare being financially inaccessible for many (Shaikh & Hatcher, 2005). Despite increasing health expenditures relative to Pakistan's GDP, there has not been a corresponding improvement in crucial health indicators such as life expectancy, infant mortality, and healthcare service quality. This discrepancy highlights the need for a thorough examination of the system's efficiency and resource allocation. Literature has revealed that there is need for further investigation into Pakistan's healthcare system could focus on several critical areas:

i. Resource Allocation: An analysis of how financial resources are allocated and utilized within the healthcare sectors could highlight inefficiencies or misallocations (Shaikh & Hatcher, 2005).
ii. Infrastructure Development: Improvements in both physical infrastructure and the integration of advanced health management technologies are needed to enhance service delivery in public hospitals.
iii. Human Resources: Addressing the shortage of healthcare professionals is vital. Policies aimed at increasing training, retention, and equitable distribution of health workers must be developed.
iv. Healthcare Accessibility: Exploring barriers to accessing healthcare, especially in the private sector, could help in formulating policies to make healthcare more affordable and equitable across different population segments.
v. Policy and Governance: Assessing the governance mechanisms of healthcare provision could identify necessary policy adjustments to improve health service delivery effectiveness.

The general overall situation of Pakistan's healthcare sector can be seen in table below:

Table1: Healthcare Sector of Pakistan at Glance

Domain	Facts	Source
Healthcare Expenditure	Healthcare spending has varied from 0.5% to 0.8% of GDP over the past ten years, which is below the 6% recommended by WHO	(Khan, 2019)
Policy Changes	Recent years have seen policy initiatives guided by the Alma Ata Declaration, with an emphasis on Primary Healthcare (PHC)	(Ali et al., 2021)
Rural Population Coverage	Basic healthcare services reach approximately 70% of the rural population	
UN Healthcare Benchmarks	Aims to achieve compliance with UN healthcare standards by 2030	
Number of Healthcare Programs	There are about 17 programs currently, which include both vertical and horizontal integration efforts	
Notable Initiatives	Key programs include the National Tuberculosis Control Program and the Lady Health Worker (LHW) Program	
Infrastructure Challenges	Healthcare infrastructure is insufficient, from a scarcity of hospitals to uneven distribution of facilities	(Khan, 2019)
Current Healthcare Expenditure	Current healthcare spending is at 0.4% of GDP, significantly under the WHO's guideline for low-income nations	
Workforce Challenges	There is a shortage of trained nurses and an inadequate doctor-to-patient ratio	(Health workforce profile of Pakistan, 2020; Khan, 2019)
Innovative Financing Models	Public-private partnerships like the Sehat Sahulat Program initiated in 2015 are promising but face challenges	(Hasan et al., 2022)

These areas represent a comprehensive approach to reforming the healthcare system in Pakistan, aiming to ensure better accessibility and quality of healthcare services for the population. Among these the work engagement is major challenge for effective performance outcomes. Leadership style has been widely recognized as a pivotal element in enhancing organizational performance and work engagement, particularly within the healthcare sector. Research indicates that the effectiveness of leadership can significantly influence both the individual and collective outputs of healthcare professionals (Al-Sawai, 2013). The integration of high-performance work systems (HPWS) further amplifies this effect, providing a structured environment in which leadership styles can more effectively impact employee outcomes (Boon et al., 2019). Leadership is recognized as a pivotal factor across various organizational types, with a particular emphasis on its significance in enhancing work engagement within healthcare settings (Leadership Academy, 2020). It is imperative to advance our comprehension of leadership's multifaceted impacts within healthcare organizations. This research primarily investigates the concept of ambidextrous leadership, defined by its dual focus on explorative and exploitative practices, and its correlation with work engagement among health professionals (Rosing et al., 2011). Furthermore, the study probes the potential of ambidextrous leadership to influence indirect health-related outcomes, evident in enhancements in high performance work systems and overall organizational performance (Birkinshaw & Gibson, 2004). Given the comprehensive influence of leadership on various organizational dimensions and individual performance, it is essential for organizations, particularly in healthcare, to delineate and understand the nuances of effective leadership practices (Zhang et al., 2015). The given study is an effort to substantiate the issue of in effective human resource depletion and their respective engagement due to leadership inefficacy. Ambidextrous leadership, which involves the capability to flexibly switch between explorative and exploitative leadership behaviors, is particularly effective in healthcare settings where both innovation and efficiency are required (Rosing, Frese, & Bausch, 2011). This style allows leaders to foster innovation (exploration) while simultaneously managing daily operations efficiently (exploitation), thereby enhancing work engagement and organizational performance (Zacher & Rosing, 2015).

Moreover, the presence of HPWS systems that enhance employee capabilities through comprehensive training, development, and decision-making autonomy—has been noted to synergize with ambidextrous leadership to promote enhanced organizational performance (Jiang et al., 2012). This interaction suggests that when leaders effectively balance and exhibit both explorative and exploitative behaviors, they enhance the organizational commitment, work engagement, and overall performance of healthcare employees (Birkinshaw & Gibson, 2004).

In sum, ambidextrous leadership profoundly impacts the performance and engagement of healthcare workers, particularly when aligned with HPWS. The efficacy of ambidextrous leadership in fostering an environment that balances innovation with operational efficiency underscores the need for strategic leadership development within healthcare institutions (Kuoppala et al., 2008).

This research focuses on the healthcare sector in Pakistan, specifically targeting health professionals employed in both government and private sector hospitals that have designated COVID-19 emergency response centers. The study is designed to capture a comprehensive cross-section of healthcare professionals, encompassing various roles and responsibilities within these organizations, thus providing a broad perspective on leadership dynamics in high-pressure environments. The investigational framework employs a cross-sectional survey method to gather

data, enabling the analysis of current perceptions and behaviors related to ambidextrous leadership and its effects.

The analytical approach is grounded in structural equation modeling (SEM) using SmartPLS 3 software, which is well-suited for complex model testing including mediation effects, thereby providing robust insights into the relationships among ambidextrous leadership, high performance work systems, work engagement, and organizational performance. The study's geographical and sector-specific focus, combined with advanced statistical analysis, delineates its precise scope within the realm of organizational behavior and healthcare management. This study addresses significant gaps identified in prior research by focusing on two primary objectives. Initially, the study investigates the influence of ambidextrous leadership on the work engagement (WE) of health professionals. It delves into the potential mechanisms through which ambidextrous leadership practices could enhance WE among this group. Subsequently, the research seeks to determine the effects of ambidextrous leadership on less direct variables that influence health professionals' WE, such as employee ambidexterity and creativity.

The foundation of this inquiry is a thorough review of relevant literature, leading to the development of a conceptual model. This model is rigorously analyzed using Partial Least Square – Structural Equation Modeling (PLS-SEM). This approach is particularly relevant in responding to recent demands for more focused research on ambidextrous leadership within the healthcare sector. To our knowledge, this investigation represents an initial effort to systematically explore and quantify the relationship between ambidextrous leadership and high-performance work systems in health services research. The structure of the paper is methodically organized to enhance clarity and flow of information. It begins by defining the key concepts and exploring their interrelationships. Following this foundational work, it presents research hypotheses and illustrates the conceptual model. The methodology section describes the selected context and details the empirical analysis conducted. The results are then thoroughly discussed, providing a robust basis for the subsequent section, which offers recommendations for implementing effective leadership styles and practices in healthcare settings. These practices aim to optimize the engagement of health professionals by encouraging them to think and act in ways that foster exceptional engagement in their roles. It is posited that in complex healthcare environments, leadership that effectively balances explorative and exploitative strategies might be particularly beneficial, thereby enhancing overall work engagement among health professionals. The following questions serve the purpose of given study:

Research Question 1: How does ambidextrous leadership (AL) among healthcare professionals influence their work engagement (WE)?

Research Question 2: What is the relationship between ambidextrous leadership (AL) among healthcare professionals and their organizational performance (OP)?

Research Question 3: How does ambidextrous leadership (AL) correlate with the implementation of high-performance work systems (HPWS) among healthcare professionals?

*Research Question 4***:** To what extent does the relationship between ambidextrous leadership (AL) and work engagement (WE) among healthcare professionals depend on high performance work systems (HPWS)?

Research Question 5: Is the impact of ambidextrous leadership (AL) on organizational performance (OP) among healthcare professionals mediated by high performance work systems (HPWS)?

Research Question 6: How does organizational performance (OP) mediate the relationship between employees' ambidexterity (EA) and their work engagement (WE) among healthcare professionals?

Thus, these questions highlight the existing problem that in the dynamic and often crisis-laden environments of healthcare sectors in developing countries, the quality of leadership is pivotal in navigating operational challenges and enhancing workforce productivity. In Pakistan, healthcare professionals frequently encounter high-pressure situations, especially in facilities designated as COVID-19 emergency response centers. This backdrop necessitates an investigation into the effectiveness of ambidextrous leadership, which embodies the capability to foster both explorative and exploitative activities among employees. Previous studies have predominantly focused on developed economies with mature healthcare systems, leaving a significant gap in understanding how ambidextrous leadership impacts work engagement and organizational performance within the developing world's healthcare context.

The proposed study aims to fill this gap by empirically examining whether ambidextrous leadership can enhance work engagement and thereby improve organizational performance among healthcare professionals in Pakistan. This inquiry is essential, as the outcomes may provide empirical support for the adoption of ambidextrous leadership practices in healthcare settings characterized by crisis and pressure, common in developing countries. Given the complex interplays of leadership styles, employee engagement, and performance outcomes in such settings, this study seeks to delineate the direct and mediated relationships between these variables, thereby offering actionable insights for policy-makers and healthcare administrators to optimize leadership development and strategic human resource interventions.

REVIEW OF THE LITERATURE

The first part of this section describes the concept from Fig. 1, the conceptual model, which is depicted in the next section. The presentation of individual concepts follows a logic of relationships, starting from the left side of Fig. 1 (with “leadership practice”) to the right side. The second part of the section considers the relationships between the different concepts.

Ambidextrous Leadership (AL)

Ambidextrous Leadership refers to the capability of leaders to simultaneously manage and balance both innovative, risk-taking activities (exploration) and efficient, predictable activities (exploitation) within an organization to achieve strategic objectives (Gibson & Birkinshaw, 2004). Ambidextrous leadership is a concept that focuses on the ability of leaders to balance exploitation of existing resources and exploration of new opportunities within an organization (Raisch & Birkinshaw, 2008). This balancing act is crucial for organizational success in today's dynamic and competitive business environment (O'Reilly & Tushman, 2013).

According to Gibson and Birkinshaw (2004), ambidextrous leadership involves simultaneously exploiting the current knowledge and capabilities of the organization while exploring new ideas and innovations. Leaders who are able to effectively manage this duality can lead their organizations to sustainable competitive advantage (Volberda, 2013).

Research by Jansen, Van Den Bosch, and Volberda (2006) suggests that ambidextrous leadership requires leaders to create a balancing act between structure and flexibility within the organization. By encouraging experimentation and risk-taking while also maintaining a focus on efficiency and productivity, leaders can foster an environment that promotes innovation and adaptability (Chen & Miller, 2012).

Effective ambidextrous leadership has been linked to improved performance outcomes in organizations (O'Reilly & Tushman, 2011). By promoting a culture of exploration and

exploitation, leaders can drive organizational growth and success in the long term (Floyd & Lane, 2000).

Thus, ambidextrous leadership is a critical capability for leaders in today's fast-paced and competitive business environment. By balancing exploitation and exploration, leaders can drive innovation and growth within their organizations, ultimately leading to sustainable competitive advantage and also enhanced work engagement and the study addresses the need for further research and investigation of this style.

High Performance Work Systems (HPWS)

High Performance Work Systems involve a comprehensive set of human resource strategies designed to enhance employee skills, commitment, and productivity, thereby transforming staff into a sustainable competitive asset for the organization. These strategies often include extensive recruitment and selection processes, incentive and compensation schemes, performance management systems, and substantial employee training and engagement (Boxall & Purcell, 2011).

A high-performance work system has been widely recognized as a strategic approach to managing human resources that aims to enhance organizational effectiveness and performance. This system encompasses a set of human resource practices such as employee involvement, skill development, rewards systems, performance management, and work design that are believed to collectively promote employee motivation, skills development, and innovative work behaviors (Boxall & Macky, 2014). Ambidextrous leadership, which involves the ability to balance between explorative and exploitative behaviors, has gained attention in recent years as a critical leadership competency for organizations seeking to thrive in dynamic and competitive environments (Jansen et al., 2016). Research suggests that ambidextrous leadership can facilitate organizational learning, innovation, and adaptation by encouraging employees to explore new ideas while also exploiting existing resources and capabilities (Rosing et al., 2011). Work engagement, defined as a positive, fulfilling, work-related state of mind characterized by vigor, dedication, and absorption, has been identified as a key driver of individual and organizational performance (Saks, 2006). Engaged employees are more likely to exert discretionary effort, show higher levels of job satisfaction, and exhibit lower levels of turnover intentions compared to disengaged employees (Bakker & Bal, 2010). The role of high-performance work systems as a mediator in the relationship between ambidextrous leadership and work engagement has gained attention in the literature. By implementing a high-performance work system, organizations can create an environment that supports ambidextrous leadership behaviors and fosters employee engagement. For example, a high-performance work system that emphasizes employee involvement and skill development can enable leaders to empower employees to engage in exploratory activities while also providing the necessary resources and support to ensure successful outcomes. In conclusion, the integration of ambidextrous leadership, high-performance work systems, and work engagement can create a mutually reinforcing system that promotes organizational innovation, agility, and performance. Future research should continue to explore the mechanisms through which these concepts interact and influence each other to inform practice and theory in the field of organizational behavior and human resource management.

Work Engagement (WE)

Work Engagement is characterized as a psychological state related to work that includes three positive dimensions: vigor, dedication, and absorption. Vigor is the energy that allows an individual to exert considerable effort at work, overcoming challenges. Dedication refers to the emotional and cognitive involvement in one’s work, enhancing feelings of significance,

enthusiasm, and pride in one's profession. Absorption represents a high level of focus and concentration on work tasks, making it difficult to detach from work and causing time to seem to pass quickly.

Ambidextrous leadership, which enables leaders to support both explorative and exploitative activities, is essential in dynamic settings such as healthcare, where adaptability to technological advancements and patient care practices is critical. Rosing, Frese, and Bausch (2011) highlight that ambidextrous leadership correlates with increased team innovation and adaptability, while Zacher and Rosing (2015) note its role in enhancing organizational agility.

High-performance work systems (HPWS), encompassing robust employee recruitment, training, and retention practices, are linked to improved organizational performance through increased employee satisfaction and productivity (Becker & Huselid, 2006). In healthcare, where services are labor-intensive and highly specialized, aligning human resources with organizational goals is crucial for operational efficiency (Pfeffer, 1998).

Furthermore, work engagement among healthcare professionals significantly impacts patient outcomes and staff retention. Bakker and Demerouti (2007) argue that work engagement results from adequate job resources and a supportive environment, which are instrumental in improving job performance and reducing turnover intentions. Additionally, engaged healthcare professionals demonstrate higher levels of empathy and patient care, which are vital for patient satisfaction and treatment adherence (Schaufeli, Bakker, & Salanova, 2006).

Therefore, exploring the interplay between ambidextrous leadership, HPWS, and work engagement in healthcare is important. Investigating how these factors collectively enhance healthcare delivery could provide valuable insights into optimal management practices and improve employee outcomes in this sector.

Organizational Performance (OP)

Organizational Performance is defined as the capacity of an organization to effectively meet its strategic objectives across various dimensions, including financial outcomes, customer satisfaction, internal processes, and learning and growth, as outlined by Kaplan and Norton (1992). Organizational performance is a critical aspect of businesses that encompasses the achievement of strategic goals and objectives. Researchers have identified various factors that impact organizational performance, including leadership styles and the adoption of high performance work systems. This literature review aims to explore the relationship between ambidextrous leadership, high performance work systems, and organizational performance. Organizational performance in the healthcare sector can be significantly influenced by ambidextrous leadership, which refers to the ability of leaders to effectively manage and balance both explorative and exploitative activities within an organization. This type of leadership is crucial in healthcare due to the dynamic nature of the industry, which requires continuous innovation while maintaining efficient daily operations (Christofi, 2024).

Explorative activities in healthcare involve the pursuit of innovative solutions and technologies, such as new treatments or cutting-edge medical devices, which can lead to substantial improvements in patient care and healthcare outcomes. Exploitative activities, on the other hand, focus on optimizing existing resources, processes, and capabilities to enhance operational efficiency and service quality (Lu et al. 2024).

Ambidextrous leadership supports organizational performance by fostering a culture that values both types of activities. Leaders who exhibit this style are adept at navigating the complexities of healthcare management, ensuring that their organizations are not only adaptable and forward-thinking but also stable and reliable.

The effectiveness of ambidextrous leadership in the healthcare sector can be assessed through various metrics such as patient satisfaction, treatment outcomes, operational efficiency, and innovation rates (Slåtten et al., 2023). Organizations that successfully implement this leadership style may see improved adaptability in response to environmental changes, better alignment between innovation and core operational processes, and ultimately, enhanced overall performance. In summary, ambidextrous leadership is a valuable approach in the healthcare sector, enabling organizations to thrive by simultaneously exploring new opportunities and optimizing existing operations. This balance is essential for sustaining long-term organizational health and effectiveness in a rapidly evolving industry landscape. Ambidextrous leadership refers to the ability of leaders to balance exploration (innovation) and exploitation (efficiency) within their organizations. Ayoko et al. (2012) found that ambidextrous leadership positively influences organizational innovation and performance. Leaders who can effectively manage both exploration and exploitation are better equipped to adapt to dynamic environments and drive organizational success.

High performance work systems (HPWS) are a set of human resource practices designed to enhance employee skills, motivation, and performance. Gong et al. (2013) highlighted the role of HPWS in enhancing employee commitment, skills, and motivation, leading to improved organizational performance. HPWS can act as a mediator in the relationship between leadership styles, such as ambidextrous leadership, and organizational outcomes.

The Social Exchange Theory provides a theoretical framework to understand the relationship between leadership styles, high performance work systems, and organizational performance. According to this theory, employees engage in positive exchanges with their organization when they perceive that their needs are being met through supportive leadership behaviors and opportunities for skill development provided by HPWS. In conclusion, ambidextrous leadership and high performance work systems are critical factors that influence organizational performance. By incorporating HPWS as a mediator in the relationship between ambidextrous leadership and organizational outcomes, organizations can enhance employee skills, motivation, and commitment, leading to improved overall performance.

Hypothesis of Study

In the light of all discussion the study developed following hypothesis:

Hypothesis 1 There is a positive relationship between health professionals' AL and their WE.

Hypothesis 2 There is a positive relationship between health professionals' AL and their OP

Hypothesis 3 There is a positive relationship between the AL of health professionals and their HPWS.

Hypothesis 4 The relationship between health professionals' AL and WE is mediated by HPWS.

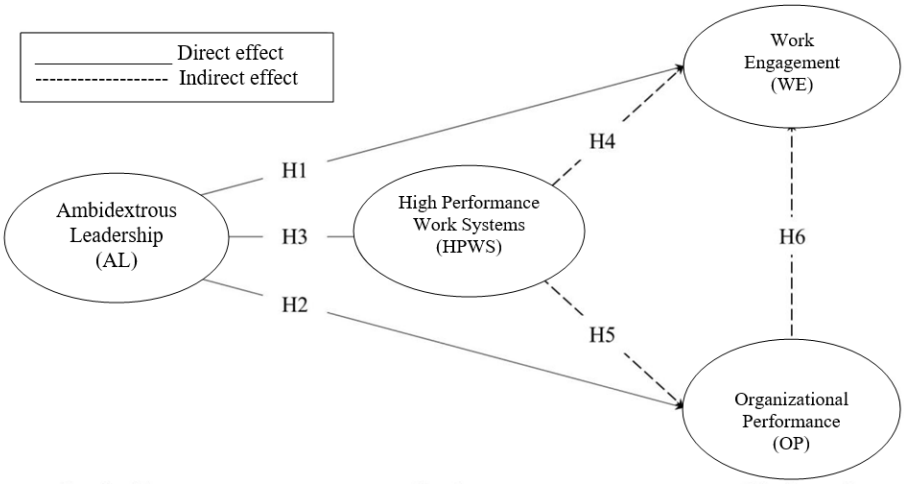
Hypothesis 5 The relationship between health professionals' AL and OP is mediated by HPWS.

Hypothesis 6 The relationship between health professionals' EA and WE is mediated by OP.

Conceptual model

Figure 1 depicts the conceptual model. All concepts in Fig. 1 are categorized into one of three categories, labeled (i) "Leadership style," (ii) "Mediator," and (iii) "Organizational Outcome Factors." The arrow signals the presence of a relationship between each of the three categories. Specifically, starting from the left in Fig. 1, we assume a logic where leadership practice is expected to function as a triggering factor that has an impact on the other two ("Employees' activities" and "Job-directed performance"). In line with the aim and focus of this study, AL represents the category "Leadership style." HPWS represents the category "Mediator." WE and OP represent the category "Outcome Factors." The solid line in Fig. 1 visualizes the assumption

about direct relationships, while broken lines visualize the assumption about indirect relationships. Figure1.



Methodology

Sample and procedure

Ambidextrous leadership is pivotal in fostering organizational adaptability and success within dynamic environments (Rosing, Frese, & Bausch, 2011). The healthcare sector, requiring a balance between innovative patient care and cost-effective administrative practices, presents a context where such leadership could yield significant benefits (Zehir & Zehir, 2023). This study aims to explore how ambidextrous leadership impacts strategic human resource practices and subsequently, organizational outcomes where HPWS refer to a group of human resource practices designed to enhance employee skills, commitment, and productivity (Combs, Liu, Hall, & Ketchen, 2006). In healthcare, these systems may encompass extensive training, empowerment initiatives, and performance incentives. This study will examine the mediating role of HPWS in facilitating the effects of ambidextrous leadership on organizational outcomes, positing that HPWS may effectively channel leadership influences to enhance both employee engagement and organizational performance (Khan, 2024). The effectiveness of ambidextrous leadership and HPWS is ultimately reflected in improved organizational performance and elevated work engagement among healthcare workers. Organizational performance in this context includes metrics such as patient care quality, operational efficiency, and financial outcomes. Work engagement is considered through the lens of psychological states of healthcare employees, including aspects of vigor, dedication, and absorption in work (Schaufeli, Bakker, & Salanova, 2006). This investigation aims to provide a comprehensive understanding of how leadership and HR strategies impact the healthcare sector. The research study is aimed to explicate the pathways through which ambidextrous leadership affects organizational performance and work engagement in the healthcare sector, focusing on the mediating role of HPWS. This study aims to contribute to the expansion of theoretical frameworks concerning leadership and organizational behavior and provide practical insights for healthcare management.

Approximately 17 hospitals were invited to participate in the study. Out of the 17, nine willingly agreed to participate in the research, an acceptance rate of approximately 53%. The focus of investigation in this study was the healthcare professionals employed in various hospitals across Pakistan. The data collection for this study will be undertaken in major metropolitan centers, namely Islamabad, Lahore, and Karachi. The establishment of appropriate inclusion criteria for healthcare workers is crucial for any study. Given study has following criteria deployed for further

analysis and explanations. Healthcare workers with a minimum organizational tenure, such as one year, to ensure that they are sufficiently familiar with leadership and organizational systems (Judge & Piccolo, 2004). A range of healthcare roles, including doctors, nurses, and administrative personnel, should be considered to capture a comprehensive perspective of the organization (Eisenbeiss et al., 2008). Workers from diverse regions within Pakistan were included to control for potential geographic variations in leadership styles or organizational performance (Uhl-Bien & Marion, 2009). Healthcare organizations of different sizes were part of the study to assess the impact of organizational size on the leadership-performance relationship (Hair et al., 1998) with full-time job were included to ensure a stable degree of interaction with organizational leadership styles (Podsakoff et al., 1996) from government and private hospitals. Hospitals that had established performance metrics to facilitate the assessment of organizational performance (Fornell & Larcker, 1981). Obtaining informed consent from healthcare workers willing to engage in data collection methods such as surveys or interviews was imperative (Hair et al., 1998).
The survey was distributed to about 500 employees, yielding 258 completed questionnaires, a response rate of 51.6%. The personal characteristics of the participants of this study are presented in Table 1.

Table 1: Personal characteristics of the study sample (N = 258)

Category	Details	**%**
Staff role	Doctors	34.5
	Nurses	49.2
	Other (health professionals)	16.3
Employed	< 5 years	35.7
	6–15 years	26.7
	16–25 years	23.3
	> 25 years	14.3
Sector	Private	66.7
	Government	33.3
Age	< 35 years	27.5
	35–50 years	38.4
	> 50 years	34.1

Instrumentation
Claims in each main measure (AL, EA, SQC, and C) were adopted. Each measure included claims with the seven-point Likert scale, ranging from “strongly disagree” (1) to “strongly agree” (7). In addition, the survey included a section on demographic characteristics, as summarized in Table 1. The data will be collected through self-administered questionnaires using an online survey platform. AL was adapted and measured through an 11-item scale from Roosing et al., 2011. Organizational Performance will be measured using scale of Kaplan & Norton, 1992, p. 72). High-Performance Work Systems was measured using a scale developed by Huselid (1995). Work Engagement Scale was derived from the University of Utrecht job Engagement Scale (UWES) by Schaufeli and Bakker in 2003. Organizational Performance was measured using scale of Kaplan & Norton, 1992, p. 72).
Data analysis

Given study employed partial least squares structural equation modeling (PLS-SEM) (Hair et al., 2022) as the data analytical procedure to test the hypotheses in given conceptual model using the SmartPLS 3 software (Ringle et al., 2015) . PLS-SEM was selected to evaluate the conceptual model because it is effective for explaining the variance in the model's dependent variables such as HPWS, WA, and OP, as detailed by Hair et al. (2022). SmartPLS is the predominant software for variance-based analyses within PLS-SEM. This software conducts the analysis through a two-stage process. Initially, it assesses the reliability and validity of the measurement model's item/claim measures. Subsequently, the focus shifts to evaluating the structural model's path coefficients. The mediator effects were also quantified and assessed using the bootstrapping method as per Zhao et al. (2010). The findings of this research align with previous literature, including Hair et al. (2019), on the reporting of PLS-SEM data.

FINDINGS AND INTERPRETATION

Measurement model

As the measurement models contained only reflective constructs, the assessment was based on primarily, convergent validity (the extent to which a variable is positively correlated with alternative variables used to measure the same construct, i.e. loading and average variance extracted); then internal consistency reliability (the magnitudes of the intercorrelations of the observed variables, using the criterion's composite reliability and Cronbach's alpha); and lastly discriminant validity (the extent to which a construct is distinct from other constructs, using the heterotrait– monotrait ratio criterion). The given study used the 'rule of thumb' criteria (Hair et al. 2015). The results in Table 3 indicated there exists reliable and valid measurement models.

Table 3 Results of the measurement model for the AL, HPWS, WE and OP constructs * AVE = Average variance extracted; HTMT = Heterotrait–monotrait ratio of correlations

Structural model

The results for the structural model are presented in Fig. 2. Figure2.

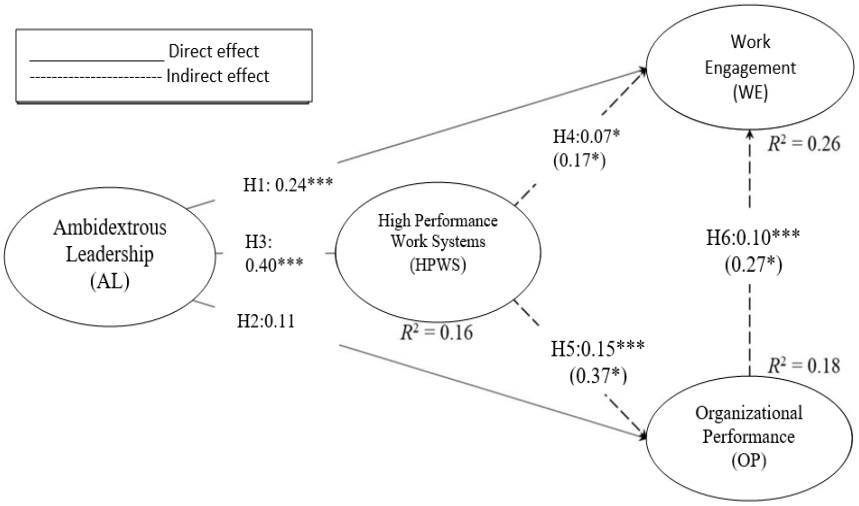


Fig. 2 Direct and indirect effect results from the structural model of the links between AL, HPWS, WE and OP.

Construct	Claims label	Claims
In general, my leader:		
AL	AL1	Allows different ways of accomplishing tasks.
	AL2	Encourages experimentation with different ideas.
	AL3	Gives possibilities for independent thinking and acting.
	AL4	Gives room for other colleagues' own ideas.
	AL5	Allows errors.
	AL6	Encourages error learning.
	AL7	Monitors and controls goal attainment.
	AL8	Establishes routines.
	AL9	Takes corrective action, if necessary.
	AL10	Controls adherence to rules.
	AL11	Sticks to plans.
In general, here:		
HPWS	HPWS1	Employees are involved in job rotation.
	HPWS2	Employees are empowered to make decisions.
	HPWS3	Jobs are designed according to employee skills and capabilities.
	HPWS4	Selection is comprehensive (uses interviews, tests etc.)
	HPWS5	Selection emphasizes their ability to join forces and work in teams.
	HPWS6	Selection involves selecting the best candidate, regardless of the specific job.
	HPWS7	Selection emphasizes promotion
	HPWS8	Selection places main concern on their potential to learn (e.g., aptitude).
	HPWS9	Training is on regular basis.
	HPWS10	Training programs are comprehensive.
	HPWS11	Training programs are to develop field-specific skills and knowledge.
	HPWS12	The training programs emphasize on-the-job experiences.
	HPWS13	Performance is based on objective, quantifiable results.
	HPWS14	Performance appraisals include feedback.
	HPWS15	Incentives are based on team performance.
	HPWS16	Compensation packages include an extensive benefits package.
	HPWS17	compensations include high wages.
	HPWS18	The incentive system is associated to skill-based pay.
	HPWS19	compensation is related to performance.
To which extent do you agree or disagree with these claims?		
WE	WE1	At my workplace, I experience a high level of energy.
	WE2	I take pride in the professional tasks I accomplish.
	WE3	I find myself deeply engaged in my work tasks.
	WE4	During work, I occasionally find myself intensely involved to the point of losing track of time.
	WE5	In my professional role, I sense robustness and vitality and I experience contentment during periods of intense work.

	WE6	I hold a positive attitude toward my work responsibilities.
	WE7	My occupational duties elicit inspiration in me.
	WE8	Upon waking up, I have the inclination to proceed with my work activities.
To which extent do you agree or disagree with these claims?		
OP	OP1	The organization focuses on quality of Services
	OP2	The organization encourages the development of new ways of treatment, diagnosis and services
	OP3	The organization provides attraction to employees
	OP4	The organization can retain employees
	OP5	Organization focuses on patient satisfaction
	OP6	Organization emphasis on healthy relationships between senior management and employees

TABLE 3

		Convergent validity		**Internal consistency reliability**		**Discriminant Validity**
Construct	**Claims label**	**Indicator reliability**		**Composite reliability**	**Cronbach's alpha**	**HTMT criterion***
'Rule of thumb'		**Loading > 0.7**		**0.7–0.95**	**0.7–0.95**	
AL	AL1	0.80	0.60	0.94	0.93	Yes
	AL2	0.85				
	AL3	0.72				
	AL4	0.87				
	AL5	0.70				
	AL6	0.81				
	AL7	0.66				
	AL8	0.80				
	AL9	0.83				
	AL10	0.75				
	AL11	0.70				
HPWS	HPWS 1	0.79	0.70	0.93	0.91	Yes
	HPWS 2	0.82				
	HPWS 3	0.83				
	HPWS 4	0.90				
	HPWS 5	0.85				
	HPWS 6	0.82				
	HPWS6	0.79				
	HPWS7	0.82				
	HPWS8	0.83				

	HPWS9	0.90						
	HPWS10	0.85						
	HPWS11	0.82						
	HPWS12	0.79						
	HPWS13	0.82						
	HPWS14	0.83						
	HPWS15	0.90						
	HPWS16	0.85						
	HPWS17	0.82						
	HPWS18	0.79						
	HPWS19	0.82						
WE	WE 1	0.83	0.72	0.88		0.80		Yes
	WE 2	0.91						
	WE 3	0.80						
	WE 4	0.83						
	WE 5	0.91						
	WE 6	0.80						
	WE 7	0.83						
	WE 8	0.91						
OP	OP1	0.96	0.94	0.95		0.93		Yes
	OP 2	0.97						
	OP 3	0.95						
	OP 4	0.96						
	OP 5	0.91						
	OP 6	0.95						

Standardized coefficients (*** < 0.01, ** < 0.05, * < 0.10). Note that the reported path parameters on the dotted lines are indirect effects while the direct effect are shown in parentheses. The research study tested the intra-construct correlations of the latent variables, namely AL, OP, WE, and HPWS, and found no issues as depicted in Table 4.

Table 4 Intra-construct (latent variables) correlations

	AL	**HPWS**	**WE**	**OP**
Ambidextrous leadership (AL)	1.000			
High Performance Work Systems (HPWS)	0.256	1.000		
Work Engagement (WE)	0.395	0.413	1.000	
Organizational Performance (OP)	0.372	0.401	0.372	1.000

The R^2 values for the endogenous constructs in the model were 0.16 for HPWS, 0.26 for WE, and 0.18 for OP. These values are deemed reasonable based on the benchmarks established by Hair et al. (2015). The analysis revealed that health professionals' AL significantly influenced their WE, thereby supporting hypothesis 1. Specifically, the path coefficient for the relationship between AL and WE was β=0.24, with a p-value of 0.010. Although hypothesis 2 indicated a

positive path coefficient of β=0.11 for the relationship between AL and OP, it was not statistically significant (p-value=0.111). Conversely, hypothesis 3, which proposed a relationship between AL and HPWS, showed a significant positive path coefficient of β=0.40 (p-value=0.000).

Further analysis on mediation hypotheses 4, 5, and 6 indicated support for these hypotheses. Specifically, hypothesis 4 suggested that HPWS mediates the relationship between AL and WE, with a path coefficient of β=0.07 (p-value=0.048) (Slåtten et al., 2023). Hypothesis 5 posited that HPWS mediates the relationship between AL and OP, resulting in a path coefficient of β=0.15 (p-value=0.002). Lastly, hypothesis 6 proposed that OP mediates the relationship between HPWS and WE, showing a path coefficient of β=0.10 (p-value=0.003). These results demonstrate that HPWS mediates the relationships between AL and both WE and OP (hypotheses 4 and 5), and the relationship between HPWS and WE is mediated by OP (hypothesis 6). In summary, the study identified partial mediation in the relationships posited in hypotheses 4 and 6 and full mediation in the relationship proposed in hypothesis 5.

Discussion and Conclusion

The application of ambidextrous leadership in the healthcare sector, as discussed in the context of post-pandemic workplace requirements, becomes particularly useful and vital. The healthcare industry, characterized by its dynamic and high-stakes environment, demands a leadership approach that can adapt to rapid changes while maintaining high standards of care and operational efficiency. Implementing this leadership style in healthcare encourages professionals to adapt to new technologies and methods without the fear of making mistakes, fostering an innovative culture that can lead to breakthroughs in patient care and health management. For example, exploration can drive the adoption of telemedicine, personalized medicine, and AI-driven diagnostics, while exploitation ensures that these innovations are implemented effectively and contribute to improved patient outcomes.

Human Resource Development (HRD) professionals in healthcare must therefore focus on cultivating leaders who can manage both aspects of ambidextrous leadership. This involves training and development programs that emphasize agile thinking and resilience, preparing leaders to handle both the routine and the revolutionary with equal proficiency. In sum, the strategic role of ambidextrous leadership in the healthcare sector not only enhances employee engagement through a high performance and supportive work environment but also directly contributes to the sector's ability to respond to evolving health crises and improve patient care outcomes.

This study uncovered the role played by AL and HPWS for health professionals' value creation manifested in their job-directed performance (referring to WE and OPC) as frontline employees. The study makes three contributions. First, it conceptualizes AL as a leadership style and practice of health professionals and contributes to understanding how AL is linked to and affects work engagement of healthcare professionals. Second, it proposes HPWS as a type of employee activity that AL affects. Moreover, the important role of HPWS in promoting health professionals' WE and OP is also revealed. Third, the study reveals how and in what way health professionals' HPWS and OP can strengthen health professionals' WE offerings. This is, to the authors' knowledge, the very first study to both conceptualize and empirically test AL and EHPWS as factors developing the WE and OP of health professionals. The study responds to the call for research on the concept of AL (Gouda & Tiwari, 2024) in health-care research. Consequently, this study investigated the impact of ambidextrous leadership (AL) on work engagement (WE) and organizational performance (OP) in the healthcare sector, with high-performance work systems (HPWS) posited as a mediating factor. The results provide a nuanced understanding of how leadership styles influence both employee engagement and performance outcomes in healthcare settings.

The in-sample predictive power of the model, indicated by R^2 values of 0.16 for HPWS, 0.26 for WE, and 0.18 for OP, suggests a reasonable level of explanatory power according to the standards by Hair et al. (2015). These findings underscore the relevance of the selected constructs in the healthcare context, reflecting their substantial role in the dynamics of organizational performance.
The analysis strongly supported Hypothesis 1, showing a significant positive relationship between ambidextrous leadership and work engagement, as evidenced by a path coefficient of β=0.24 (p-value=0.010). This suggests that the ability of healthcare leaders to balance explorative and exploitative behaviors positively impacts employee engagement levels. Hypothesis 2, which posited a positive relationship between AL and OP, however, did not reach statistical significance, with a path coefficient of β=0.11 and a p-value of 0.111. This indicates that while AL may influence OP, other factors not accounted for in this model might be at play or the direct impact of AL on OP is weaker than anticipated. The results for Hypothesis 3, which showed a robust positive relationship between AL and HPWS (β=0.40, p-value=0.000), demonstrate that ambidextrous leadership is a potent influencer of the adoption or enhancement of high-performance work systems. This finding highlights the role of versatile leadership in fostering environments that enhance both the capabilities and the performance of healthcare organizations.
Furthermore, the mediation analyses (Hypotheses 4, 5, and 6) revealed intricate dynamics. HPWS was found to mediate the relationship between AL and both WE and OP (Hypotheses 4 and 5). Specifically, the path coefficients of β=0.07 (p-value=0.048) for the mediation of AL and WE, and β=0.15 (p-value=0.002) for the mediation of AL and OP, suggest that the implementation of high-performance practices can enhance the impact of ambidextrous leadership on both employee engagement and organizational performance. The mediation of HPWS between AL and WE is particularly compelling, indicating that HPWS not only supports, but actively enhances, the relationship between leadership style and employee engagement.
Hypothesis 6 posited that OP mediates the relationship between HPWS and WE, with a significant path coefficient of β=0.10 (p-value=0.003). This supports the notion that organizational performance can be a crucial link between effective work systems and enhanced employee engagement, highlighting a reciprocal benefit between operational success and workforce motivation.
In summary, the study underscores the significance of ambidextrous leadership in developing high-performance work systems and enhancing work engagement and organizational performance in the healthcare sector. These findings suggest that healthcare organizations might benefit from fostering leadership styles that are flexible and adaptable, promoting both innovative and optimized practices that enhance both immediate and strategic outcomes.
This paper contributes in building a piece of knowledge regarding AL and HPWS, which is a domain that has been neglected in previous health services research. Specifically, the findings reveal how AL and HPWS can promote health professionals' WE and OP. The study implies that health-care organizations must be determined to employ, train, and expand their leaders to become AL. Doing so will have a direct impact on WE as well as HPWS. In addition, AL will also transform HPWS in a positive direction and indirectly stimulate employees' OP as well as strengthen health professionals' WE offerings. Furthermore, the findings of this study suggest several policy implications for the healthcare sector. First, healthcare organizations should consider adopting ambidextrous leadership (AL) as a formal part of their leadership development programs. Given the significant positive relationship between AL and work engagement, and the indirect benefits on organizational performance through high-performance work systems (HPWS), policies that promote such leadership styles could enhance both employee satisfaction and

healthcare delivery. Training programs that focus on developing the skills necessary for both exploitation (optimizing current systems and procedures) and exploration (innovating and adapting to new challenges) should be prioritized.

Secondly, policy makers should encourage the implementation of HPWS in healthcare settings. This study's findings underscore the mediating role of HPWS in enhancing the effects of AL on both employee engagement and organizational performance. As such, policies that support the development of these systems could further strengthen the sector's resilience and adaptability, particularly in post-pandemic scenarios where these qualities are crucial. Lastly, considering the role of AL in fostering an environment that promotes the adoption of technological advancements such as AI and telemedicine, healthcare policies should also support the integration of these technologies into routine healthcare practices. This could include funding for technology adoption, incentives for organizations that demonstrate innovative practices, and regulations that facilitate safe and efficient technology use in healthcare.

Limitations of the Study

While this study provides valuable insights, several limitations must be acknowledged. The study's predictive power, as indicated by the R^2 values, while reasonable, suggests that there are other variables not captured by this model that may influence HPWS, work engagement (WE), and organizational performance (OP). Further research could explore additional factors that might impact these relationships.

Additionally, the non-significant relationship between AL and OP directly, as indicated by the p-value associated with this relationship, suggests a more complex dynamic that may involve other mediating or moderating variables not considered in this study. Future studies could aim to uncover these variables to provide a more comprehensive understanding of how AL impacts OP.

Moreover, the study's focus on a single sector (healthcare) and the potential for regional biases due to the study's geographical limitations suggest that the findings may not be universally applicable to other sectors or regions. Replication of this study in other contexts, both within and outside the healthcare sector, would be beneficial to confirm the applicability of the findings.

In conclusion, while this study advances our understanding of ambidextrous leadership and high-performance work systems in healthcare, acknowledging and addressing its limitations through continued research will be crucial for developing more effective leadership practices and policies.

Future Research Directions

To further explore ambidextrous leadership (AL) and high-performance work systems (HPWS) in healthcare and other sectors, future studies could consider the following approaches: Longitudinal Studies: Implement longitudinal designs to track changes in work engagement, organizational performance, and HPWS over time, offering insights into causal relationships and long-term effects. Diverse Settings: Conduct research in various geographical locations and healthcare environments to test the generalizability of the findings across different institutional and cultural contexts. Additional Variables: Include variables such as organizational culture, employee autonomy, and external factors like regulatory changes to better understand their impact on AL, HPWS, and organizational outcomes. Qualitative and Mixed-Methods Approaches: Use qualitative methods such as interviews and case studies to gain deeper insights into how AL and HPWS are perceived and implemented by healthcare professionals. Mediating and Moderating Variables: Explore potential mediators and moderators, such as employee well-being or technology adoption, to uncover additional pathways and conditions affecting the effectiveness of AL and HPWS. Sector-Wide Comparative Studies: Compare the impact of AL and HPWS across different sectors to determine their applicability and effectiveness in various organizational

contexts. Impact of Training Programs: Evaluate the effectiveness of training programs designed to develop ambidextrous leadership skills, particularly their influence on leaders' ability to balance exploitation and exploration.

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