

EXPLORING THE PATHWAYS FROM LEADERSHIP TO WORK EFFORT: EMPIRICAL EVIDENCE ON THE MEDIATING ROLE OF ENGAGEMENT IN HEALTHCARE

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Abstract

With a focus on the intermediary function of work engagement, the current study explores how perceived leadership affects employee work dedication in the healthcare sector. Using a quantitative research approach, a structured questionnaire was employed to survey healthcare personnel from different establishments in order to measure work engagement, work dedication and transformational and transactional leadership. A self-administered questionnaire was used to collect data and confirmatory factor analysis, Cronbach's alpha and the Kaiser-Meyer-Olkin measure were used to verify the concepts' validity and reliability. According to the results, both leadership philosophies have a major impact on workers' commitment to their job, but transformational leadership has a stronger effect on encouraging engagement. Additional research on mediation emphasizes how important work engagement is in converting good leadership into increased commitment to one's work. This study is one of the few empirical investigations looking into how work dedication, engagement and leadership interact in the healthcare industry. The findings imply that effective leadership not only has a direct effect on worker performance but also creates a stimulating workplace environment that increases perseverance and commitment. Policymakers and healthcare managers seeking to develop transformational leadership abilities to increase employee engagement and eventually improve patient care outcomes will find these findings useful. This study makes a substantial theoretical and practical contribution by elucidating the operational mechanisms through which leadership affects worker performance. In order to better understand the relationship between leadership engagement and work dedication in diverse healthcare environments, future research is encouraged to employ longitudinal designs and investigate other factors.

Keywords: Employee commitment, Job performance, Leadership styles, Work Effort

1. INTRODUCTION

Healthcare workforce sustainability remains an urgent concern in 2025. Persistent high levels of burnout, continued post-pandemic attrition, and ongoing staffing shortfalls have weakened system capacity and raised questions about long-term quality of care and organisational resilience (Sanford et al., 2022; Li et al., 2021). In these gruelling times, cooperation and communication between organizations and their employees are essential but a herculean task. A sense of belonging, job integration and accountability for organizational results are some of the elements that affect healthcare workers' faculty and prowess to apply their knowledge and concentrate on organizational objectives. It is astronomical to consider how employees view the organization's support. These demands risk the long-term viability of the healthcare workforce by causing burnout. To improve care quality and prevent burnout, support measures must be put in place. These measures may include letting staff members select how they want to be engaged, pushing for policies and creating crisis management plans and employees' perceptions of organisational assistance are crucial (Gordon et al., 2020; Naeem et al., 2019). The conduct, dispositions and output of healthcare personnel are greatly influenced by leadership. Transformational leadership and contingent rewards motivate and increase the effectiveness and satisfaction of healthcare researchers (Musinguzi et al., 2018). Transformational leaders expand and enhance their staff's values, foster consciousness and dedication to the organization's aim and goal, and empower subordinates to achieve their self-interests for the collective benefit of the organization. Moreover, the healthcare sector and its organizations depend on a hierarchical professional logic that promotes top-down processes and leadership (Günzel-Jensen et al., 2018).

Moreover, Work effort is a multi-dimensional construct encompassing what employees work on, how hard they work, and how long they persist (Van Iddekinge et al., 2022). Increased effort can improve outcomes in healthcare, especially in developing countries (Okeke, 2019). However, overexertion, especially in strenuous jobs, can be detrimental to the well-being of employees and their career prospects (Avgoustaki&Frankort, 2018). Neoclassical economics indicates a negative effect on health, but occupational health research has shown that work can be healthy if it is conducted under good conditions. Poor conditions can also impair health even with moderate effort (Urtasun& Núñez, 2018; Sharafizad, et al., 2020). Discretion at work can minimize these adverse effects. Healthcare employees in highly stressful environments face extreme difficulties in maintaining effort levels and eventually burn out and deteriorate their well-being. Mindfulness practices and environmental designs reduce workplace stressors and advance well-being (Valipoor& Bosch, 2021). Tailored intervention strategies, such as resilience-enhancing programs, schedule optimization strategies, and mental health sources, can reduce burnout and improve job satisfaction significantly (Alrehali et al., 2022). The effort-reward imbalance model indicates that high efforts associated with low rewards increase the propensity for poor outcomes; supportive measures are thus needed to keep up efforts in health service settings.

Perceived leadership in healthcare is the way that employees perceive their leaders' behavior and effectiveness. Transformational leadership, which is typically embraced by managers, is associated with greater job satisfaction, organizational commitment, and innovation (Gashaye et al., 2023). It enhances the quality of life and satisfaction of employees, particularly in terms of promotion and supervision (Sabbah et al., 2020). Although "transformational and transactional leadership styles" are both more efficient, nurse managers are more likely to prefer transactional approaches than physicians. Gender differences exist: male nurses perceive managers as more transformational, and male managers score lower on transactional leadership. Leadership, therefore, is essential for the effective enhancement of nurse well-being and organizational success. Leadership perception plays a crucial function in ascertaining employee attitudes and organizational outcomes. Transformational leadership improves perceptions of organizational reputation directly and indirectly through empowerment, whereas transactional leadership negatively impacts perceptions (Wei et al., 2020). Authentic leadership has a strong connection with job satisfaction and organizational commitment, and workplace pleasure. Paternalistic as well as servant leadership increased job satisfaction and organizational commitment and decreased negative political perceptions in public sector employees' settings (Khuwaja et al., 2020). Leadership impacts employee attitudes by altering job characteristics, perceptions, and hence behavior (Giallourous, et al., 2023).

Work engagement is a favorable, employment-related condition marked by passion, devotion, and concentration. Vigor is characterized by high energy levels and resilience, dedication with strong involvement and enthusiasm for the work, and absorption through deep concentration and work immersion (Salamon et al., 2021; Meijerink et al., 2020). These dimensions are assessed using "the Utrecht Work Engagement Scale (UWES)". Job and personal resources are significant predictors of engagement, particularly in high-demand jobs. Schaufeli (2012) identifies work engagement as a vital construct in organizational research, defined by high levels of energy, dedication, and absorption in one's work. The review synthesizes evidence on the antecedents and outcomes of engagement, highlighting its positive effects on performance, well-being, and organizational commitment. Importantly, Schaufeli emphasizes the dynamic and collective nature of engagement, suggesting that it can fluctuate over time and across teams. Although prior research has extensively explored general work contexts, limited studies have examined engagement specifically among healthcare workers or its linkage with perceived leadership, underscoring the relevance of investigating how perceived leadership behaviors can enhance work engagement. Engaged employees are more creative, productive, and willing to do more than what is expected from them (Schaufeli et al., 2019). Although some research questions the three-factor structure of engagement due to overlap with job satisfaction, leadership styles are crucial in the development of engagement. Work engagement has emerged as an important mediating factor in many workplace dynamics (Yücel et al., 2023). Research has demonstrated partial mediation in the relationship between workplace bullying and turnover intention (Coetzee & Van Dyk, 2018), as well as between meaningful work and job-crafting behavior (Lee, & Han, 2025). Work engagement, meanwhile, has been identified to mediate the team level of relationship between team social resources and in-role and extra-role performance (Wingerden et al., 2018). This completely mediates the work involvement and affective commitment, further enhancing the potential impact of work engagement on improved outcomes while lessening negative impacts and its significance in studies about human resource management and organizational behavior.

Leadership is essential in determining administrative results and employee behavior especially in healthcare settings where high stress levels call for efficient motivational techniques. Despite a wealth of research on leadership philosophies and how they affect healthcare workers' job satisfaction, little is known about how these elements interact to affect output. Addressing this informational lacuna is a *sine qua non* for advancing the present research because healthcare workers oftentimes deal with issues like emotional exhaustion and work-related stress that can lower their alacrity, ebullience, motivation and productivity. Investigating the relationship between healthcare staff members' perceived leadership, work engagement and effort is the goal of the current study. In order to give healthcare managers useful insights on how to improve work force productivity and employee well-being through the use of supportive leadership and engagement strategies, this study looks at how perceptions of leadership behaviors stimulate work engagement, which in turn affects work effort with work engagement acting as a mediating factor. In order to motivate healthcare professionals, the study

aims to clarify how perceived leadership affects work engagement and effort. The literature review brings underneath its ambit the research gaps, the methodology collects data from healthcare providers and the findings show how engagement can mediate the relationship between leadership and effort.

2. REVIEW OF LITERATURE

2.1 Theoretical Framework

a) **Transformational & Transactional Leadership Theory**—Transformational Leadership Theory holds that leaders inspire their followers through the articulation of a compelling vision, intellectual stimulation, and individual consideration (Bass & Avolio, 1994). Such leaders inspire employees to rise above individual interests and commit to organizational goals. In the healthcare context, transformational leaders create trust, empower their staff, and build supportive environments where employees feel appreciated and motivated; they are role models to kinds of behaviors that are fostered by sharing of purpose and collaboration, thereby increasing an employee's sense of engagement. This theory provides a framework for the study assuming that perceived transformational leadership positively influences the level of employee interest and directly correlates with an increased level of work effort and sustained performance in a demanding healthcare setting (Lee et al., 2019). Transactional leadership is based on clear exchanges between leaders and employees, where leaders set expectations, reward good performance, and address mistakes (Avolio & Bass, 2004). This approach uses two main strategies: contingent rewards, which recognize and motivate employees, and management-by-exception, where leaders step in to correct problems (Garzón-Lasso et al., 2024). Studies have shown that transactional leadership can enhance employee effort, satisfaction, and effectiveness (Alhuzaim et al., 2022), promote engagement in public sector organizations (Thanh & Quang, 2022), and ensure strict adherence to procedures in critical care units (Al-Rjoub et al., 2024). It is especially effective in structured environments where maintaining discipline and consistent performance is important.

b) **Kahn's Psychological Conditions of Engagement Theory (Kahn, 1990) – Engagement:** According to Kahn (1990), in his theory engagement occurs when employees invest their physical, emotional, and cognitive energies in their work roles. Engagement occurs when employees perceive three conditions: psychological meaningfulness, psychological safety, and availability. When healthcare workers feel that leadership supports them and treats them fairly, they feel safe and valued, and they are more likely to engage. Engagement leads to proactive behaviors, commitment, and resilience, all of which are vital in a high-stress environment such as a hospital. By placing more emphasis on psychological conditions, Kahn's theory concurs with the mediation model in this study, stating that leadership creates meaningful work experiences that facilitate engagement, which in turn, empowers employees to put forth more effort toward organizational and patient-centered outcomes (Huang, et al., 2022).

c) **Vroom's Expectancy Theory (Vroom, 1964) – Work Effort:** The Vroom's Expectancy theory implies that individuals act based on three factors: First expectancy, that their effort will lead to performance; second, instrumentality, that performance will lead to outcomes; and third, valence, how much value one places on the outcomes (Vroom, et al., 2015). In the realm of patient care, motivation is increased if an employee believes that effort goes into better patient care and that such efforts will be recognized by the leadership. Perceived leadership serves as the key factor by setting clear goals, rewarding, and then instructing or providing feedback, essentially enhancing the expectancy and instrumentality. This theory aligns with the framework of this study to explain how employees work with high effort toward organizational and patient-centered goals once engaged, influenced in part by supportive leadership (Barnett, 2019).

2.2 Reviews Related to the Relationship Between Perceived Leadership Styles (Transactional and Transformational) and Employee Work Efforts in Healthcare Settings).

Several studies explored the connection between results and types of leadership of various kinds in health organizations, including employee motivation, job satisfaction, teamwork, and care quality. Musunguzi et al., (2018) studied the influence of a leadership style on the level of motivation of health employees, their level of job satisfaction, and teamwork at different levels in Uganda. This study found that “leadership style significantly influences job satisfaction” and motivation. Widiyanto & Wilderom, (2023) study found that “leadership style significantly influences job satisfaction” and motivation. More specifically, transformational leadership has a more positive effect on the work environment. Similarly, Marniansi et al., (2021) found a direct relationship between leadership style with employees' performance in health centers in Indonesia, where the direct impact was noticed based on outcomes of performance. Günzel-Jensen et al., (2018) & Giallourous, et al., (2023) focused on the aspect of distributed leadership in healthcare, with formal leadership styles being very key to organizational effectiveness. This study implies that an integrated mix of styles of leadership, rather than one, best facilitates organizational success and effective healthcare delivery. Mekonnen, & Bayissa, (2023) health employees' commitment and efficacy for organizational change rise anytime administrative staff members demonstrate transformational and/or transactional leadership behaviors. Additionally, the study discovered that a quarter of organizational change preparedness may be influenced by the two leadership ideologies. Transformational leadership, particularly through individualized consideration, has been found to mitigate effort–reward imbalance by fostering supportive leader–employee relationships (Weiß & Süß, 2016). This finding underscores the broader role of perceived leadership in influencing employees' motivation, well-being, and work effort. Leadership behaviors play a crucial role in shaping outcomes within healthcare, influencing not only measurable outputs but also motivation, effectiveness, and satisfaction among professionals. Patel et al. (2016) found that transformational leadership

behaviors, such as idealized attributes, inspirational motivation, intellectual stimulation, and individual consideration, as well as transactional behaviors through contingent reward, significantly enhanced leadership outcomes, even if they did not directly impact research performance. Building on these insights, the present study examines how perceived leadership behaviors, particularly transformational and transactional leadership, influence work effort in healthcare, highlighting the psychological and experiential pathways through which leadership shapes individual and organizational outcomes. (Chan & Chan, 2005) empirically examined the role of transformational and transactional leadership in predicting employee outcomes, including extra effort, effectiveness, and satisfaction. Their findings highlight that transformational leadership significantly enhances employee motivation and performance, beyond the effects of transactional leadership. These insights reinforce the argument that perceived leadership behaviors play a pivotal role in shaping employees' work effort, a connection central to the present study on healthcare workers. Such evidence complements the view that effective leadership behaviors can enhance employee engagement, which in turn sustains higher levels of effort, especially in demanding contexts like healthcare.

In their systematic review, Specchia et al., (2020) examined leadership styles and their influence on job satisfaction in healthcare, emphasizing the importance of supportive and efficient work environments. Complementing this, Zaghini et al., (2020) and Sharafizad et al., (2020) found that transformational approaches enhance both patients' perceptions of care quality and employees' overall experiences. Building on this foundation, Specchia et al., (2021) extended the discussion with another systematic review focused on nurses, concluding that both transformational and transactional styles were effective in improving job satisfaction and engagement. That same year, Warri (2021) analyzed leadership in the broader healthcare context, highlighting its role in influencing the overall quality of health services. Al-Dossary (2022) found that nurse engagement and organisational commitment were favourably. Garzón-Lasso et al., (2024) expanded this discussion by demonstrating that transformational leadership continues to play a central role in shaping job satisfaction, strengthening organisational commitment, and sustaining employee engagement, which collectively contribute to improved healthcare performance. This supports the view that perceived leadership styles in healthcare settings are likely to play a decisive role in shaping employees' work effort. All these studies together stress that management approaches' function in healthcare outcomes is significant and is found in multiple settings.

Thus, the hypothesis derived:

H1: There is a significant relationship between perceived leadership styles (transactional and transformational) and employee work effort in healthcare settings.

2.3 Reviews Related to the Relationship Between Work Engagement and Employee Work Effort in High-Stress Healthcare Environments

Sundry studies have examined the effects of work engagement among healthcare employees on performance well-being and the delivery of healthcare services making it a prominent topic in current research. Prior research has highlighted the essential role of work engagement in translating organizational factors into positive employee outcomes. Kim et al. (2019) demonstrated that work engagement positively influences employee outcomes such as job performance and reduced turnover intention. Although their study focused on resources rather than leadership, the findings reinforce the idea that engaged employees invest greater energy and persistence in their roles. This supports that work engagement is positively related to employee work effort in high-stress healthcare environment. A cross-sectional study on work engagement in the healthcare industry was carried out by Patrick and Mukherjee (2018) who emphasized the significance of this topic in connection to productivity and job satisfaction. Vargas-Benítez et al., (2023) conducted a meta-analysis and systematic review among nursing staff on burnout syndrome and work engagement that revealed a negative correlation between the two highlighting the sine qua non of interventions to reduce burnout and increase engagement. In addition, Neuber et al., (2021) carried out a meta-analysis on the relationship between absenteeism performance and work engagement. The findings showed that higher levels of engagement are associated with better performance and lower absenteeism highlighting the significance of promoting work engagement in healthcare settings (Zakiy, 2024).

Kaiser et al., (2018) investigated the impact of interprofessional collaboration on employee outcomes. They discovered that improving employee engagement and job satisfaction requires interprofessional work environments. A meta-analysis by (Wee & Lai, 2021) furthered this body of knowledge by demonstrating a positive relationship between work engagement and patient care quality. Improving the well-being of employees essentially results in better healthcare outcomes. Furthermore Sasaki et al., (2021) looked at the influence of smartphone-based stress management on work engagement among Vietnamese nurses. Results found that it can promote work engagement, thus being one potential way to reduce stress levels and subsequently improve nurse's engagement. Finally, Ge et al., (2021) highlighted how healthcare professionals in conjunction to their job satisfaction and engagement are impacted by effort-reward imbalance. These results point to a complex relationship between these factors suggesting that addressing them simultaneously or in concert can improve healthcare workers health outcomes by increasing work engagement (Lai et al., 2020). The combined results of these studies highlight how important employee engagement is for improving workforce performance in the healthcare industry.

Thus, the hypothesis derived:

H2: There is a significant positive relationship between work engagement and employee work effort in high-stress healthcare environments.

2.4 Reviews Related to the Role of Work Engagement as a Mediator Between Perceived Leadership(Transactional and Transformational)and Employee Work Effort

Leadership styles, employee engagement and the critical role that leadership plays in promoting engagement and influencing organizational outcomes have been the subjects of recent studies. Leadership in healthcare organizations plays a pivotal role in shaping employee outcomes. Recent research emphasizes the mediating role of work engagement in shaping healthcare workers' performance outcomes. Poku et al., (2025) demonstrated that higher levels of engagement reduce turnover intentions, underscoring its critical influence on sustaining employee effort. Extending this evidence, transformational leadership—through inspiration, vision, and individualized support—can cultivate stronger engagement, while transactional leadership—through structure, monitoring, and reward systems—can reinforce it. Both leadership approaches therefore provide pathways through which engagement mediates the relationship between leadership behaviors and employee work effort. Ashfaq et al. (2021) highlighted that ethical leadership fosters employee engagement through the mediating effects of self-efficacy and organizational commitment, emphasizing how leadership grounded in moral values channels its influence via psychological and attitudinal resources. Similarly, Khan et al. (2025) found that digital leadership enhances employees' sense of empowerment, which in turn fosters techno-work engagement and improves sustainability performance in public healthcare institutions. Their study emphasizes how leadership behaviors indirectly influence work engagement, reinforcing its mediating role between leadership and employee effort. Ashfaq et al. (2024, 2025) further highlighted that sustainable leadership drives work engagement through perceived organizational support, mental health, and gratitude. These findings reinforce the idea that leadership behaviors do not directly translate into improved employee outcomes; rather, their impact flows through work engagement, which acts as a bridge between leadership practices and employee performance. Collectively, these findings reinforce that perceived leadership influences healthcare employees' work effort primarily by fostering engagement and cultivating enabling workplace conditions. Building on this, the present study takes a step further by examining not only the mediating role of work engagement but also its direct connection to employees' work effort—an outcome that remains underexplored in leadership literature, particularly in healthcare contexts. Further evidence comes from studies examining the psychological and social mechanisms of engagement, Hassan & Ikramullah, (2024) partially confirmed a mediator between transformational leadership and work engagement, whereas Udin et al., (2022) concluded that transactional leadership significantly influences knowledge sharing and employee engagement knowledge sharing and engagement, which in turn enhances innovative work behavior (Iddagoda et al., 2020). Kim et al. (2019) found that work engagement fully mediates the relationship between job and personal resources and employee outcomes, positioning it as an essential psychological mechanism rather than a supplementary factor. In their meta-analysis of the relationship between leadership and engagement, Decuyper & Schaufeli (2021) found that leadership behavior has a significant impact on employee engagement through a variety of channels which in turn affects motivation and the work environment. Nikolova et al., (2019) investigated the relationship between employee engagement and engaging leadership discovering that engaged leaders encourage greater employee engagement generating a feedback loop that improves effectiveness. Negative leadership behaviors also demonstrate the mediating role of engagement. Reio & Sanders-Reio (2011) demonstrated that both supervisory and coworker behaviors significantly influence engagement. Their findings suggested that constructive behaviors enhance engagement, whereas incivility or negative interactions undermine it, ultimately shaping the level of employee work effort. Expanding on this, Jawahar and Schreurs (2018) found that supervisor incivility diminishes engagement and performance, emphasizing engagement as a key mechanism linking leadership perceptions to outcomes. Conversely, positive leadership interventions strengthen engagement (Knight et al., 2019), and addressing employees' basic psychological needs further sustains engagement (Rahmadani et al., 2019). Building on this, Koon and Ho (2020) highlighted how authentic leadership, characterized by candor and empathy, enhances employee well-being, which in turn strengthens engagement. Contextual factors were shown to amplify the mediating role of engagement. Vermeulen & Scheepers (2020) reported that when employees perceived high organizational support, the effect of leadership on engagement—and ultimately on work effort—was significantly stronger. Together, these studies underline the multidimensional role of leadership in shaping employee engagement, which in turn drives both organizational performance and employee outcomes (Adeniji et al., 2020). Yet, research exploring these relationships within healthcare settings remains limited, underscoring the need for further investigation into how leadership influences work effort through engagement in this critical sector. Thus, the hypothesis derived:

H3: Work engagement significantly mediates the relationship between perceived leadership styles (transactional and transformational) and employee work effort in healthcare settings

3. Objectives of the study

Obj 1: To examine the relationship between perceived leadership styles (Transactional and Transformational) and employee work effort in healthcare settings.

Obj 2: To investigate the relationship between work engagement and employee work effort in high-stress healthcare environments.

Obj3: To assess the role of work engagement as a mediator between perceived leadership (Transactional and

Transformational) and employee work effort.

4. RESEARCH METHODOLOGY

Research Design: The study employed a quantitative research approach to examine perceived leadership and its effects on employee work effort. In this case, work engagement served as the mediator variable. This approach measures healthcare employees' responses to leadership perceptions and their influence on work effort through the mediator.

Data Collection: Both primary and secondary data sources were used. For primary data, structured questionnaire was used, and for secondary data, they supplemented the concepts related to perceived leadership and work engagement.

Study Area: The study focused on the Delhi NCR region, which provided a robust and diverse pool of healthcare employees as the study population.

Instrumentation: A self-developed questionnaire was used to measure work effort, while the Utrecht Work Engagement Scale (UWES) was applied to assess work engagement (Schaufeli et al., 2006). Leadership style was measured using the Multifactor Leadership Questionnaire (Avolio & Bass, 2004; Avolio et al., 1995, 1999).

Sampling Technique: A stratified random sampling technique was applied to ensure that the respondents' sample workforce included healthcare employees and to target their perceptions and experiences.

Target Population: The target population consists of healthcare professionals who had been selected to study how perceived leadership affects their engagement and work effort. The reason for choosing this particular group was their capacity to offer firsthand knowledge of the leadership philosophies thought to affect workers' commitment to their jobs.

Sample Size: The study obtained a sample size of 385 using the Cochran formula, but to make the study more reliable, it chose 400 healthcare employees as a final sample size.

Sampling Tools and Techniques: Data analysis was conducted using Microsoft Excel, SPSS, and SmartPLS (Ringle et al., 2024). Descriptive statistics (mean, standard deviation) and inferential techniques (correlation and structural equation modeling, SEM) were employed to test the relationships among variables and to establish whether work engagement acted as a mediator between perceived leadership and employee work effort.

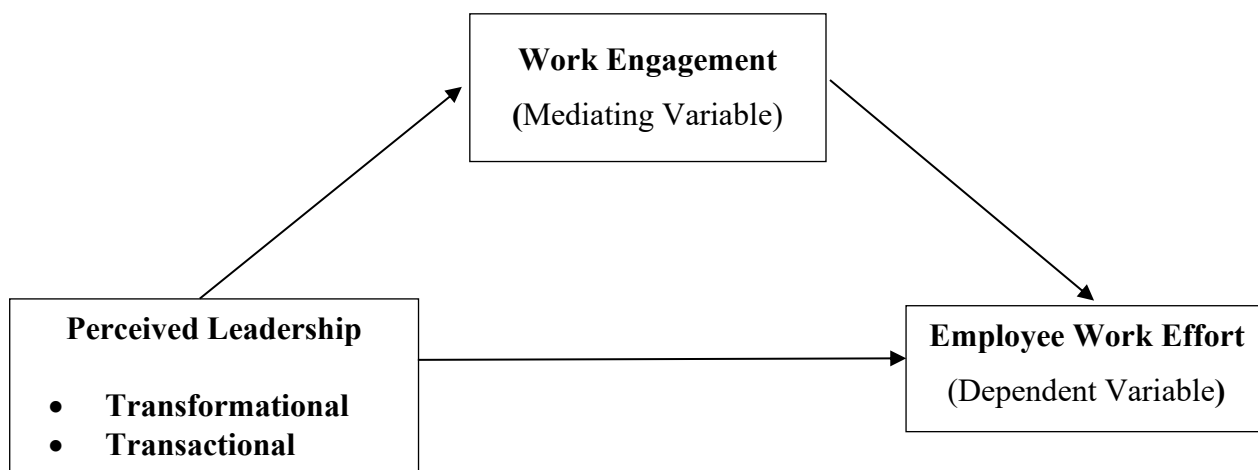


Figure 1: Research Model
Source: Self-prepared by Author

This conceptual framework illustrates a mediating relationship where work engagement serves as the mechanism through which perceived leadership styles (the independent variable) influence employee work effort (the dependent variable) in healthcare settings. The model posits that both transformational and transactional leadership have a direct effect on work effort (H1a, H1b). Furthermore, it hypothesizes that these leadership behaviors are instrumental in fostering work engagement (as derived from Kahn's theory), which itself has a significant positive relationship with effort (H2). The central proposition (H3) is that work engagement significantly mediates the primary relationship, meaning leadership influences effort largely by creating an environment that promotes psychological engagement. The design of this framework is informed by several theories: Transformational Leadership Theory explains the inspirational influence of leaders, Transactional Leadership Theory highlights the role of contingent rewards and corrective actions in guiding performance, Kahn's Psychological Conditions of Engagement Theory provides the foundation for the mediating variable, and Vroom's Expectancy Theory helps explain the cognitive process linking engagement to the ultimate outcome of increased work effort. Here are hypotheses of the study:

H1a: There is a significant relationship between transactional leadership styles and employee work effort in healthcare settings.

H1b: There is a significant relationship between transformational leadership styles and employee work effort in healthcare settings.

H2: There is a significant positive relationship between work engagement and employee work effort in high-stress healthcare environments.

H3: Work engagement significantly mediates the relationship between perceived leadership styles (Transactional and Transformational) and employee work effort in healthcare settings.

5. RESULTS

The subsection contained the result stage together with the data analysis. There is a sub-section based on reliability and validity, demographic features, aims, and assumptions. A table presenting the outcomes and an explanation of those results has been included in the mentioned goals and hypotheses.

Table 1 Reliability and Validity Statistics Table

Reliability Statistics				
Label	Cronbach's Alpha	N of Items	KMO and Bartlett's value	Sig. value
Transactional Leadership	0.929	5	0.854	0.000
Transformational Leadership	0.938	4	0.811	0.000
Work Engagement	0.944	5	0.882	0.000
Employee Work Effort	0.950	6	0.897	0.000

Table 1 shows the reliability and validity statistics, internal consistency is demonstrated, with the data being good enough for factor analysis. Transactional Leadership attained a reliable Cronbach's Alpha of 0.929 and sampling appropriateness with KMO at 0.854. Transformational Leadership $\alpha=0.938$, KMO=0.811; Work Engagement $\alpha=0.944$, KMO= 0.882; Employee Work Effort $\alpha = 0.950$, KMO = 0.897; say that all these constructs are extremely reliable and signify that these have strong KMO values, demonstrating that the items that belong to each sub-construct are highly consistent, and hence, the dataset being very well suited for any further statistical analysis. The data adequacy for the factor analysis is further confirmed by the highly significant p value (<0.001) of Bartlett's test for all constructs, highlighting the reliability of the findings.

● Dropped/Removed Item

To achieve a better model fit, the decision was made to remove item TFL2 from the Transformational Leadership construct. During the reliability and validity testing, it was found that TFL2 had low factor loading compared with other items in the construct, meaning that it contributed least to ward the overall consistency and construct validity of the scale. The elimination of TFL2 increased the value of Cronbach's Alpha and, therefore, the internal consistency of the scale. Moreover, removal of this item resulted in a refined measurement model with better model fit indices as observed from confirmatory factor analysis. This adjustment now makes the Transformational Leadership construct a truer representation of the underlying theoretical framework and enhances the rigor of the analysis.

Table 2 Demographic Characteristics of the Respondents

Sr.no.	Demographics	Category	Frequency	Percentage
1.	"Gender"	"Male"	214	53.5%
		"Female"	186	46.5%
2.	Age	"Below 25 years old"	115	28.7%
		"26-35 years old"	152	38.0%
		"36-45 years old"	79	19.8%
		"Above 45 years old"	54	13.5%
3.	"Working Experience"	"Less than 5 years"	128	32.0%
		"5-10 years"	165	41.3%
		"More than 10 years"	107	26.8%
4.	Hierarchical Position	Not Managerial	130	32.5%
		Intermediate Managerial	150	37.5%

		Higher Managerial	120	30.0%
5.	“Marital Status”	“Single”	177	44.3%
		“Married”	223	55.8%

Table 2 shows the demographic profile of responders revealing a diverse distribution across all categories. According to the data, men made up 53. 5% of the total population while women made up 46.5%. 38% were between the ages of 26 and 35, 19.8% were between the ages of 36 and 45, 13.5 % were over 45 and 28.7% were under 25. Of those with work experience 32% had less than five years, 43% had five to ten years and 28% had more than ten years. 32. 5% of people did not hold managerial positions 37. 5% held intermediate managerial positions and 30. 0% held higher managerial positions. Data on marital status revealed that 55. 8% of people were married and 44. 3% were single. This comprehensive representation of all demographics provides a balanced foundation for the investigation.

RESULTS BASED ON HYPOTHESIS

“H1a: There is a significant relationship between transactional leadership styles and employee work effort in healthcare settings.”

Table 3 Correlation Table

		Transactional Leadership	Employee Work Effort
Transactional Leadership	Pearson Correlation	1	.555**
	Sig. (2-tailed)		.000
	N	400	400
	Mean	18.32	
	Standard Deviation	4.64	
Employee Work Effort	Pearson Correlation	.555**	1
	Sig. (2-tailed)	.000	
	N	400	400
	Mean		23.75
	Standard Deviation		5.51
**. Correlation is significant at the 0.01 level (2-tailed).			

Table 3 indicates that transactional leadership style has a significant and positive relationship with employee work effort as represented by a Pearson correlation of 0.555 at the 0.01 significance level in health environments. Accordingly, a strong transactional leadership style—which includes components like goal incentives, effort-reward reciprocity acknowledgment error handling and corrective actions—is linked to increased employee commitment in terms of task involvement, workload organization, consistent performance work loyalty, goal focus and task ranking. The mean score for transactional leadership is

18.32 (SD = 4.64), while that for employee work effort is 23.75 (SD = 5.51), indicating relatively higher levels of employee engagement. This emphasizes the core role credible transactional leadership has in promoting and nurturing employee achievement in healthcare environments. Hence, the hypothesis is accepted and shows a significant relationship between transactional leadership styles and employee work effort in healthcare settings.

“H1b: There is a significant relationship between transformational leadership styles and employee work effort in healthcare settings.”

Table 4 Correlation Table

	Transformational Leadership	Employee Work Effort
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Transformational Leadership	Pearson Correlation	1	.538**
	Sig. (2-tailed)		.000
	N	400	400
	Mean	10.67	
	Standard Deviation	2.87	
Employee Work Effort	Pearson Correlation	.538**	1
	Sig. (2-tailed)	.000	
	N	400	400
	Mean		23.75
	Standard Deviation		5.51

Table 4 shows that transformational leadership has been positively correlated with employee work effort in healthcare settings, wherein the Pearson correlation coefficient of 0.538 is significant to the 0.01 levels (2-tailed). Augmented employee work engagement is strongly correlated with progressive transformational leadership concepts and principles which include goal orientation, task prioritization, efficient work practices, consistent job performance, equitable workload distribution and workplace dedication. Employee work effort was measured at a mean of 23.75 (SD = 5.51) indicating elevated levels of employee engagement while the average score for transformational leadership was 10.67 (SD = 2.87). Therefore, it can be said that transformational leadership creates a favorable environment that enhances employee performance and encourages dedication in the healthcare industry. Hence, the hypothesis is accepted and shows a significant relationship between transformational leadership styles and employee work effort in healthcare settings.

“H2: There is a significant positive relationship between work engagement and employee work effort in high-stress healthcare environments.”

“H3: Work engagement significantly mediates the relationship between perceived leadership styles (Transactional and Transformational) and employee work effort in healthcare settings.”

Table 5 Communalities Table

Communalities		
	Initial	Extraction
TsL1	1.000	.799
TsL2	1.000	.809
TsL3	1.000	.747
TsL4	1.000	.684
TsL5	1.000	.775
TfL1	1.000	.589
TfL3	1.000	.634
TfL4	1.000	.699

WE1	1.000	.847
WE2	1.000	.845
WE3	1.000	.783
WE4	1.000	.815
WE5	1.000	.822
EWE1	1.000	.786
EWE2	1.000	.797
EWE3	1.000	.799
EWE4	1.000	.788
EWE5	1.000	.775
EWE6	1.000	.734
Extraction Method: Principal Component Analysis.		

Table 5 shows the communalities table displays the strength to which each item is explained by the under lying component sex tracted by PCA. For TsL, itemsTsL1toTsL5exhibithigh extraction values between 0.684 and 0.809, indicating a very good fit of these items on the factor structure. For TfL, items TfL1, TfL3, and TfL4 had moder at extraction values with a range between0.589and0.699, indicating reason able fits in the model. In WE, ItemsWE1to WE5 were pulling very high extraction values from 0.783 to 0.847, suggesting that dimensions such as energy, vigor, enthusiasm, inspiration, and pride contribute significantly to the definition of the overall construct. Finally, for EWE, items EWE1 to EWE6 yielded strong extraction values of 0.734-0.799, thus validating the representation of taskinvolvement and goal orientation in this factor solutions. These very high communalities prove the stability of the extracted components and the reliability of the measurement items intended to represent these constructs.

Table6RotatedComponentMatrixTable

Rotated Component Matrix^a			
	Component		
	1	2	3
TsL1	.846		
TsL2	.857		

TsL3	.817		
TsL4	.763		
TsL5	.849		
TfL1	.693		
TfL3	.754		
TfL4	.783		
WE1			.868
WE2			.827
WE3			.841
WE4			.874
WE5			.855
EWE1		.804	
EWE2		.793	
EWE3		.839	
EWE4		.805	
EWE5		.801	
EWE6		.765	
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.			
a. Rotation converged in 5 iterations.			

To assess the underlying structure of the observed variables, Exploratory Factor Analysis (EFA) was performed using Principal Component Analysis with Varimax rotation. The analysis resulted in the extraction of three distinct factors that align with the conceptual model: Perceived Leadership, Work Engagement, and Employee Work Effort.

● **Factor1: Perceived Leadership**

This factor includes eight items (TsL1 to TsL5 and TfL1, TfL3, TfL4), all of which loaded strongly on a single component, suggesting a unified construct encompassing both transactional and transformational leadership elements.

● **Factor2: Work Engagement**

Five items (WE1 to WE5) showed high loadings on this factor, clearly representing dimensions such as energy, vigor, enthusiasm, and absorption, consistent with the Utrecht Work Engagement Scale (UWES).

● **Factor3: Employee Work Effort**

Six items (EWE1 to EWE6) loaded significantly on this factor, validating it as a standalone construct reflecting dimensions of task involvement, persistence, and goal orientation.

The rotated component matrix (Table 6) clearly shows that item loadings are above the recommended threshold of 0.60, demonstrating strong convergent validity and no significant cross-loadings. Furthermore, the KMO values (all above 0.80) and Bartlett's significant test results confirmed the suitability of the data for factor analysis. Together, these outcomes validate the factor structure used in the subsequent SEM analysis and hypothesis testing.

Table 7 Convergent Validity of the Constructs

S.no.	Construct	Items	Standardized loadings	Cronbach's Alpha	Composite Reliability (CR)	Average Variance Extracted (AVE)
1.	Perceived Leadership	TfL1	0.701	0.941	0.941	0.669
		TfL3	0.737			
		TfL4	0.787			
		TsL1	0.881			
		TsL2	0.897			
		TsL3	0.847			
		TsL4	0.814			
		TsL5	0.860			
2.	Work Engagement	WE1	0.906	0.945	0.945	0.775
		WE2	0.910			
		WE3	0.841			
		WE4	0.863			
		WE5	0.881			
3.	Employee Work Effort	EWE1	0.864	0.943	0.943	0.735
		EWE2	0.876			
		EWE3	0.859			

		EWE4	0.864			
		EWE5	0.853			
		EWE6	0.825			

Table 7 indicates an indication of the robustness of constructs, as well as the measurement items reliability and validity statistics. The "Perceived Leadership" construct, pooling transformational and transactional leadership items (TfL1,TfL3,TfL4,TsL1-TsL5),includes a standardized loading range of 0.701-0.897, indicating high contributions from the items. Cronbach's alpha of 0.941, composite reliability (CR) of 0.941 and average variance extracted (AVE) of 0.669 all indicated that the construct was highly reliable demonstrating strong convergent validity. With a Cronbach's Alpha and CR of 0.945and an AVEof0.775and standardized loadings for Work Engagement (WE1-WE5) that ranged from 0.841 to 0.910 the results demonstrated strong measurement for validity and reliability in terms of energy, enthusiasm and pride. Employee Work Effort (EWE1-EWE6) also showed standardized loadings between 0.825 and 0.876 a Cronbach's Alpha and CR of 0.943 and an AVEof0.735 indicating that it was possible to measure task involvement, workload management and goal orientation effectively in addition to having strong internal consistency. It has been determined that the constructs and their corresponding items in the entire dataset are appropriate for additional validation and evaluation. The study showed that both transactional and transformational types of leadership have considerably affected employee work effort in healthcare settings, where work engagement (energy, vigor, enthusiasm, inspiration, pride) was an important mediator. Transformational leaders engage in idealized influence, individualized consideration, and inspirational motivation and show extremely strong standardized loadings (e.g., TfL4 = 0.787) and hence have an important effect in terms of work engagement and employee effort Inaddition, transaction al leadership, which revolves around effort-reward exchange and corrective action, also exhibited strong performance with good loadings (e.g., TsL2 = 0.897) and accountability indicators.

Yet, transformational leadership might lead to higher intrinsicmotivationandengagementof employees because of its higher emphasis on inspiration and individualized consideration. Constructs' reliability and validity (good construct validity and internal consistency) werealso confirmed with very high Cronbach' salpha values(0.941forperceivedleadership,0.945 for work engagement, and 0.943 for employee work effort) indicating that transactional and transformational leadership are both very effective. A few factors: vigor, enthusiasm, and pride, all under work engagement; goal orientation and consistency in performance, under work effort promote best employee outcomes when led by a transformational leader.

Table8 Discriminant Validity Table

	EWE	PL	WE
EWE	0.857		
PL	0.616	0.818	
WE	0.610	0.436	0.880

Table8 shows the discriminant validity results which were valuated through "thesquareeroot of the Average Variance Extracted (AVE)" per construct supports that constructs differ from each other. The diagonal values EWE: 0.857, PL: 0.818, andWE:0.880representthesquare root of the AVE for Employee Work Effort (EWE), Perceived Leadership (PL), and Work Engagement (WE), respectively. The figures are greater than the other off-diagonal correlations among the constructs, since the measures each share more variance with their own items than with any other construct. For example, thecorrelationbetweenEWEandPL is 0.616, which is well below both EWE' sandPL 'sassociated square root AVE values(0.857 and 0.818 respectively). Similarly, the correlation between WE and PL comesto0.436,very much below the square roots of their AVE. Strong discriminant validity is confirmed in this context; it guarantees that the constructs are sharply defined, each measuring different concepts effectively.

Table 9 Goodness of Model Fit Table

TheGoodnessof Fitness Index	GFI	AGFI	CFI	NFI	RMSEA	TLI	SRMR
-----------------------------	-----	------	-----	-----	-------	-----	------

CalculatedValue	0.872	0.837	0.943	0.924	0.083	0.935	0.045
ExpectedValue	Above 0.9	Above 0.9	Above 0.9	Above 0.9	Below0.10	Above 0.9	Lessthan 0.05

Table 9 shows the goodness-of-fit indices provide a comprehensive assessment of the model's fit. While some indices meet the expected thresholds, others fall slightly short. The Goodness of Fit Index (GFI) is 0.872 and the Adjusted Goodness of Fit Index (AGFI) is 0.837, both slightly below the ideal threshold of 0.9, suggesting an adequate fit. However, the Comparative Fit Index (CFI) and Normed Fit Index (NFI) exceed the threshold at 0.943 and 0.924, respectively, indicating a good fit for these indices. The Root Mean Square Error of Approximation (RMSEA) is 0.083, which is within the acceptable range (below 0.10), suggesting reasonable model error. The Tucker-Lewis Index (TLI) at 0.935 meets the expected value, reflecting a strong incremental fit, and the Standardized Root Mean Square Residual (SRMR) at 0.045 is well below the threshold of 0.05, signifying excellent residual fit. Overall, the model demonstrates a good fit.

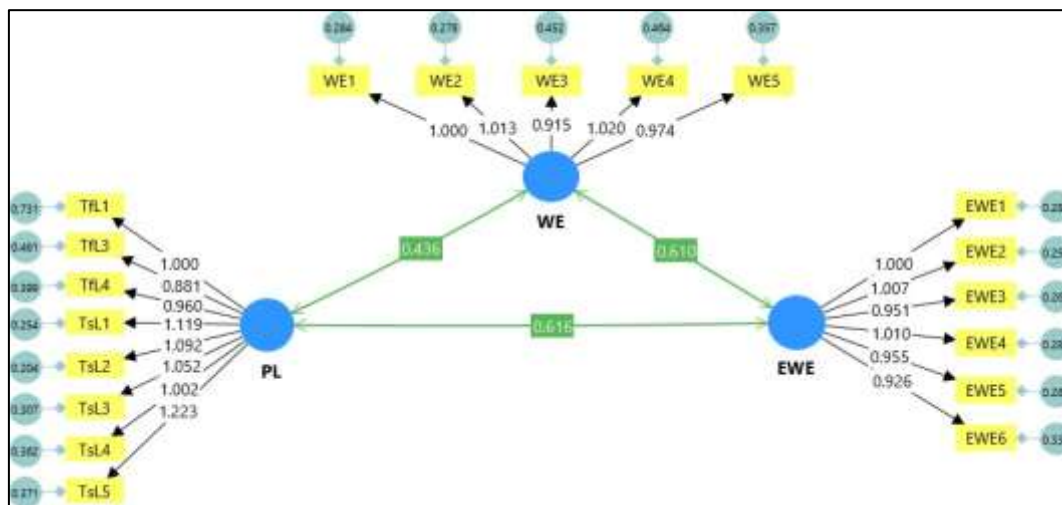


Figure2 SEM Model

The above structural model describes the interrelationships between Perceived Leadership (PL), Work Engagement (WE), and Employee Work Effort (EWE). PL, which consists of eight items (TfL1, TsL5), is highly loaded on the standardized factor, directly influencing both WE (0.436) and EWE (0.616). WE is an mediating variable measured through five items (WE1-WE5) that significantly affect EWE (0.610), underlying its role in promoting employee effort. EWE, the dependent variable, is assessed through six items (EWE1-EWE6) that load significantly as strong contributors. Eventually, the model shows the direct and indirect pathways through which leadership affects employee effort through engagement, demonstrating the positive influence of effective leadership and employee level of engagement on job performance.

Table10 Hypothesis Testing

Hypothesis	Predicted Relationship	Direct effect	Indirect effect	Total effect	Parameter Estimates	t-value	p-value	Mediation
	PL ->EWE	0.616	-	0.616	0.473	8.682	0.000	-
H2	WE ->EWE	0.610	-	0.610	0.636	9.444	0.000	-
H3	PL->WE->EWE	0.616	0.266	0.882				Partial Mediation

Table 10 shows **For H2:** The findings strongly support the hypothesis of a positive relationship between work engagement (WE) and employee work effort (EWE) in a healthy environment that is intensely stressful. It was noted that employees with high energy, enthusiasm, and pride in the irwork are involve d in task performance, workload management, and commitment to their job, with 0.610 for direct effect ($t = 9.444$, $p < 0.001$). This underscores the importance of work engagement in realizing employee performance and effectiveness in the challenging environment of healthcare. **For H3:** From the results, it can be concluded that work engagement acts as a partial mediator in the relationship between perceived leadership styles (PL) and employee work engagement (EWE) as stated in H3. In particular, leadership bears an influence of 0.616 directly on employee work effort. On

the otherhand, the indirect influence via work engagement is calculated to be 0.266 which results in a total effect of 0.882. This shows that both transactional and transformational leadership styles directly enhance employee effort, but work engagement further enhances this effect.

By inspiring them and establishing a positive work atmosphere, leadership promotes employee engagement which raises their effort and output. According to the research, employees' work effort is positively impacted by both transactional and transformational leadership styles; however transformational leadership is more conducive because it fosters greater levels of intrinsic motivation and engagement which has a greater overall effect on work effort.

6. DISCUSSION

The study of healthcare workers' perceptions regarding leadership, work engagement, and effort formed the basis of the investigation. The findings revealed that work engagement was a significant mediator between employee effort and leadership styles. For example, transformational leadership had a direct impact on work engagement, which in turn increased work effort. This suggests that inspirational, motivating, and directional leaders produce greatly engaged and productive workers. The results indicate that although both transformational and transactional leadership styles have an impact on work effort, transformational leadership seems to have a greater effect on employee engagement, which in turn affects performance.

Much like Musinguzi et al. (2018), whose research showed transformational leadership as a contributor to motivation and job satisfaction for healthcare workers in Uganda, transformational leadership has also been found by Marniansih et al. (2021) to have a promising impact on performance outcomes of health facilities in Indonesia. But while other studies were limited to direct leadership-work outcomes links, the present research focused on mediating roles through work engagement. This is a novel contribution to the literature since it provides evidence of work engagement as an indirect effect of leadership besides its direct effect on effort at work.

According to Günzel-Jensen et al. (2018), who classified the effect of dispersed administration influences team efficiency; the study further corroborates the supposition that styles of leadership affect engagement and group dynamics. Unlike studies which have principally aimed attention at approaching dispersed or variable guidance, this study directed on transformation ala ministration an da scerta in ed that engagement-advancing guidance style shad no table and worthwhile repe rcussion sat work. In contrast to Wei et al. (2020), who found that transactional leadership adversely affected organizational perspectives, this study indicated that transformational leadership manifests a highly positive influence through engagement. Therefore, it suggests that to enhance motivation and effort, healthcare administrators should triage a transformational approach. Therefore, leaders must work with transformational practices to support, empower, and communicate visions to which their workforce can relate. Training programs on transformational leadership should be developed to allow managers to connect better with employees to reinforce engagement and work levels. Moreover, health management organizations must combine guidance development interspersed with intelligence, motivational ideas, and group cooperation.

By developing an engagement-driven culture, health care settings can further lessen burnout risk while simultaneously improving performance measures.

Table 11: Comparison of Top 5 Studies

Citation	Finding	Research Gap	How Our Study Filled the Gap
Musinguzi et al. (2018)	Transformational leadership positively impacts motivation and job satisfaction.	Insufficient emphasis on the mediation function of work engagement.	Exhibited the intermediary function of work involvement between management and efforts.
Marniansih et al. (2021)	Leadership styles directly induce performance effects in healthcare settings.	Did not address how work engagement mediates leadership-effort relationship.	Emphasized the role of engagement as an intermediary in performance outcomes generated by leadership.
Günzel-Jensen, et. al. (2018)	Distributed leadership enhances team dynamics and performance.	Limited focus on transformational leadership and its impact on individual effort.	Showed that transformational leadership enhances effort through increased engagement.

Weietal. (2020)	Transactional leadership negatively impacts organizational perception.	Focused on negative aspects of transactional leadership rather than the positive role of transformation.	Provided evidence of positive impacts of transformational leadership on effort via engagement.
Schaufeliet al. (2019)	Work engagement improves creativity and productivity.	Did not connect engagement specifically with leadership styles and effort.	Established the correlation among transformative leadership, engagement, and heightened effort.

Source: Self-prepared by author

7. CONCLUSION

Work engagement is a key mediating component in the study's examination of the effects of perceived leadership styles on employee work effort in pertinent healthcare settings. The results indicate that although both transformational and transactional leadership styles have an impact on work effort, transformational leadership seems to have a greater effect on employee engagement, which in turn affects performance. Thus, this demonstrates how effective leadership has a direct and indirect impact on organizational outcomes. According to the research, work engagement has a substantial mediating role in the link between employee work effort and leadership styles. The immediate result of transformational leadership is increased work effort, which stimulates motivation and offers individualized attention. Additionally, it fosters an environment where workers feel committed, enthusiastic, and capable of handling pressure.

Practical Implications

- **For the Healthcare Sector:** Transformational leadership development programs can provide substantial advantages for healthcare organizations. Employee performance is likely to improve, unemployment rates could decrease, and patient outcomes may become better in public hospitals and clinics as they undergo training focused on fostering a transformational culture to cultivate leaders who inspire, empower, and connect with their teams. Enhancing workplace quality allows for the sustained delivery of high-quality services in a challenging healthcare landscape.
- **For Academics:** The research considerably embellishes the academic literature concerning guidance and employee data inside the healthcare area. It provides a strong endowment for future studies aimed at surveying the arbitrating part of work engagement and fact-finding supplementary factors that manage influence work effort. The results advance the idea that philosophers embrace complex models to include together the direct and indirect belongings of guidance on performance, accordingly improving hypothetical discussions and practical studies in administrative act and health care administration.
- **For Policymakers:** Policymakers may use these findings to create policies for advocacy and leadership development across healthcare institution settings. By appreciating transformational leadership's role in fostering employee engagement, policy initiatives can endorse training and certification programs to develop leadership skills. Such support programs could then be implemented via standards promoting environmental work settings in healthcare organizations for sustaining a vigorous workforce that efficiently and effectively delivers public health services.
- **Contribution to Theory and Practice:** Most hypotheses concern workplace partnership as a mitigator of the connection centrally located leadership guidance and work effort. By engaging this two-fold-pathway approach, we explain by virtue of what leadership impacts conduct and present professionals' insight into designing administration practices to harbor employee data and productivity. These verdicts thus serve as a bridge between theoretical modeling and constructive aims, therefore making imperative contributions to the academic discourse in addition to management practice in the healthcare precinct.

Limitations

The study offers important points of view but has several limitations. With a cross-sectional design, the inferral of causality between the variables is infeasible. Besides, size and specific healthcare settings looked into might limit the generalization of the findings to other contexts or areas.

Future Research

Future research should adopt longitudinal research designs incorporating larger and more heterogeneous sample to enhance the generalizability and robustness of the findings. Additionally, longitudinal approaches are recommended to examine causal pathways and temporal dynamics among leadership styles, work engagement, and employee work effort. To help extrapolate the results and find potential mediators or moderators factors, the research will be extended to different health care roles, locations, and cultural contexts. The diverse impacts of various leadership philosophies on employee engagement and effort in particular healthcare settings warrant further investigation. The complex

relationship between leadership and employee performance in the healthcare industry should be better understood by future research that incorporates additional mediators or moderators, such as organizational culture, job satisfaction, or outside influences. The current study prognosticates on the pivotal role that leadership plays in influencing the work engagement and practices of employees in the healthcare milieu. The findings will be significant for academic researchers, policymakers, and healthcare organizations. They will augment and proliferate dimensions for additional research to traverse upon these baseline findings.

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