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Leadership Competencies and Digital Health Adoption in Healthcare Organizations: A Conceptual Framework Integrating Change Readiness and Training Effectiveness

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Abstract:
Digital health transformation is critical for healthcare organizations, yet implementation success remains inconsistent. This paper presents a conceptual framework explicating how leadership competencies influence digital health adoption through dual mediating pathways: healthcare providers' change readiness and training effectiveness. The framework integrates Human Capital Theory, Transformational Leadership Theory, and Organizational Readiness for Change Theory. Five Leadership Practices Inventory competencies serve as antecedent factors, with change readiness encompassing psychological and behavioral preparedness, and training effectiveness evaluated through knowledge acquisition and skill application. Seven testable propositions emerge from the framework. This model advances theoretical understanding of leadership's role in healthcare digital transformation while providing practical guidance for leadership development and workforce preparation strategies aligned with digital health implementation objectives, particularly supporting Saudi Vision 2030 healthcare digitization goals.

Keywords — leadership competencies, digital health adoption, change readiness, training effectiveness, healthcare transformation, conceptual framework.

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I. INTRODUCTION

Digital health transformation has emerged as a defining priority for healthcare systems globally, promising enhanced service delivery, improved patient outcomes, and operational efficiency gains. The integration of electronic health records, telemedicine platforms, artificial intelligence applications, and mobile health solutions represents a fundamental shift in healthcare delivery paradigms. Despite substantial technological investments, implementation success remains inconsistent across healthcare organizations, with many initiatives failing to achieve anticipated benefits or sustain adoption over time [1], [2].

The Kingdom of Saudi Arabia has positioned digital health transformation as a cornerstone of its Vision 2030 national development strategy. The National Transformation Program explicitly prioritizes healthcare digitization to achieve improved access, quality, and efficiency across the healthcare system [3]. King Salman Medical City, as one of the nation's premier tertiary healthcare institutions serving over 1.2 million patients annually, exemplifies both the opportunities and challenges inherent in large-scale digital health implementation.

Emerging evidence increasingly suggests that successful digital health adoption extends beyond technological infrastructure to encompass critical human factors [4]. Healthcare providers constitute

the primary users and implementers of digital health systems, and their acceptance, competency, and engagement fundamentally determine implementation outcomes. Provider resistance, inadequate preparation, and insufficient leadership support have been identified as persistent barriers to adoption across diverse healthcare contexts [5].

This paper addresses this theoretical gap by presenting a comprehensive conceptual framework that explicates the relationships between leadership competencies, healthcare providers' change readiness, training effectiveness, and digital health adoption. By integrating established theoretical perspectives with contemporary evidence, the framework offers both explanatory power for understanding adoption dynamics and practical guidance for organizational leaders seeking to facilitate successful digital transformation.

II. THEORETICAL FOUNDATIONS

The proposed conceptual framework synthesizes three complementary theoretical perspectives that collectively address the leadership, organizational, and individual factors influencing digital health adoption.

A. Human Capital Theory

Human Capital Theory, originating from the seminal work of Schultz [6] and Becker [7], posits that investments in workforce knowledge, skills, and capabilities generate returns in organizational performance and productivity. Within the digital health context, this theory provides a lens for understanding how leadership competencies represent organizational human capital that can be leveraged to facilitate technological transformation. The application emphasizes that leadership competencies and workforce training constitute strategic investments yielding returns through improved digital health adoption and utilization.

B. Transformational Leadership Theory

Transformational Leadership Theory, developed by Burns [8] and elaborated by Bass [9], describes how leaders inspire followers to transcend self-interest and commit to organizational goals through four mechanisms: idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration. This theoretical perspective has demonstrated particular relevance to healthcare contexts, where leaders must navigate complex change initiatives while maintaining workforce engagement. The Leadership Practices Inventory operationalizes transformational leadership through five competency domains aligning with digital health implementation requirements [10].

C. Organizational Readiness for Change Theory

Weiner's [11] Organizational Readiness for Change Theory conceptualizes readiness as a shared psychological state characterized by organizational members' commitment to implementing change and confidence in their collective capability. The theory distinguishes between change commitment and change efficacy, both influenced by organizational factors including leadership support, resource availability, and situational factors. This perspective provides the foundation for understanding healthcare providers' change readiness as a mediating mechanism between leadership competencies and digital health adoption.

III. THE CONCEPTUAL FRAMEWORK

The proposed framework positions leadership competencies as the primary antecedent factor influencing digital health adoption through two parallel mediating pathways: healthcare providers' change readiness and training effectiveness. This dual-mediation model acknowledges that leadership influence operates through both psychological and capability-building mechanisms.

A. Leadership Competencies

Drawing upon the Leadership Practices Inventory framework [10], leadership competencies encompass five interrelated domains: Model the Way involves leaders clarifying values and demonstrating commitment through technology utilization; Inspire a Shared Vision encompasses articulating compelling visions of digitally-enabled healthcare; Challenge

the Process involves seeking innovative approaches and learning from implementation experiences; Enable Others to Act focuses on fostering collaboration and strengthening capacity; Encourage the Heart involves recognizing contributions and creating supportive culture.

B. Healthcare Providers' Change Readiness

Change readiness, as the first mediating mechanism, encompasses healthcare providers' psychological and behavioral preparedness to adopt digital health technologies. Psychological readiness includes positive attitudes toward technology and emotional acceptance of change. Behavioral readiness encompasses willingness to learn new systems and adapt work practices. Leadership competencies influence change readiness through multiple pathways including modeling adoption, inspiring vision, enabling action, and providing recognition [12].

C. Training Effectiveness

Training effectiveness represents the second mediating pathway, encompassing outcomes of structured learning interventions. Drawing upon Kirkpatrick's Training Evaluation Model [13], effectiveness is conceptualized across multiple levels: reaction, learning, behavior, and results. Leadership competencies influence training effectiveness through resource allocation, program design decisions, and creation of supportive learning environments that translate into improved digital health adoption.

D. Digital Health Adoption

The outcome construct, digital health adoption, is conceptualized drawing upon the Technology Acceptance Model [14]. Adoption encompasses behavioral intention to use digital health systems, perceived usefulness, perceived ease of use, and trust in system capabilities. Successful adoption manifests in sustained utilization achieving intended clinical and operational benefits.

IV. FRAMEWORK PROPOSITIONS

The conceptual framework generates seven testable propositions regarding the relationships between constructs, as presented in Table I.

TABLE I
FRAMEWORK PROPOSITIONS AND HYPOTHESIZED RELATIONSHIPS

No.	Proposition Statement	Pathway
P1	Leadership competencies have a positive direct effect on digital health adoption	Direct
P2	Leadership competencies have a positive effect on healthcare providers' change readiness	Mediation 1
P3	Leadership competencies have a positive effect on training effectiveness	Mediation 2
P4	Healthcare providers' change readiness has a positive effect on digital health adoption	Mediation 1
P5	Training effectiveness has a positive effect on digital health adoption	Mediation 2
P6	Healthcare providers' change readiness mediates the relationship between leadership competencies and digital health adoption	Indirect
P7	Training effectiveness mediates the relationship between leadership competencies and digital health adoption	Indirect

V. RESULTS AND DISCUSSION

A. Theoretical Contributions

This conceptual framework advances theoretical understanding of digital health adoption in several significant ways. First, it integrates three established theoretical perspectives—Human Capital Theory, Transformational Leadership Theory, and Organizational Readiness for Change Theory—into a coherent explanatory model. This integration addresses the limitation of single-theory approaches that capture only partial aspects of the complex adoption phenomenon.

Second, the framework explicates the mediating mechanisms through which leadership competencies influence adoption outcomes. By identifying change readiness and training effectiveness as parallel mediating pathways, the model moves beyond direct-effect conceptualizations to capture nuanced processes through which leadership influence operates. This theoretical specification enables more precise hypothesis testing and intervention design.

Third, the framework bridges the leadership and health informatics literature streams, which have largely developed independently. By positioning leadership competencies as antecedent factors within a technology adoption framework, the model creates theoretical linkages stimulating

cross-disciplinary research and knowledge exchange [15].

B. Practical Implications

The framework offers actionable guidance for healthcare leaders and organizations pursuing digital transformation. For leadership development, the model identifies specific competency domains requiring attention. Leaders must develop capabilities not only in traditional management functions but in vision articulation, change facilitation, and workforce enablement specifically relevant to technological transformation.

For workforce preparation, the dual-mediation model suggests that addressing both psychological readiness and capability development is essential for successful adoption. Organizations should invest in comprehensive strategies encompassing attitude cultivation, anxiety reduction, and skill building rather than focusing narrowly on technical training alone.

C. Policy Implications

For policymakers advancing Saudi Vision 2030 healthcare transformation objectives, the framework suggests several strategic priorities. Leadership development programs should be integrated into digital health implementation strategies, recognizing that technological investments alone are insufficient for achieving transformation goals. National workforce preparation initiatives should address both readiness cultivation and competency development [16].

D. Future Research Directions

The proposed framework generates multiple avenues for empirical investigation. Cross-sectional studies can test the hypothesized relationships and assess the relative strength of direct and mediated pathways. Longitudinal designs can examine how relationships evolve across implementation phases. Comparative studies across healthcare settings and national contexts can assess framework generalizability and identify contextual moderators [17].

VI. CONCLUSIONS

This paper has presented a comprehensive conceptual framework explicating the relationships between leadership competencies, healthcare providers' change readiness, training effectiveness, and digital health adoption. By integrating Human Capital Theory, Transformational Leadership Theory, and Organizational Readiness for Change Theory, the framework provides a theoretically grounded model for understanding and facilitating digital transformation in healthcare organizations.

The dual-mediation structure acknowledges that leadership influence operates through both psychological and capability-building pathways, offering nuanced understanding informing more effective intervention strategies. The seven framework propositions provide testable hypotheses for empirical validation and theoretical refinement.

As healthcare organizations worldwide pursue digital transformation, understanding human factors determining success becomes increasingly critical. This framework contributes to that understanding by illuminating how leadership competencies can be leveraged to create conditions conducive to sustained digital health adoption. For the Kingdom of Saudi Arabia and similar contexts pursuing ambitious healthcare digitization agendas, the framework offers both theoretical insight and practical guidance for achieving transformation objectives.

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REFERENCES

[1] A. Abernethy, L. Adams, M. Barrett, et al., "The promise of digital health: Then, now, and the future," NAM Perspectives, 2022.
[2] I. J. Borges do Nascimento, H. Abdulazeem, L. T. Vasanthan, et al., "Barriers and facilitators to

utilizing digital health technologies by healthcare professionals," NPJ Digital Medicine, vol. 6, no. 1, p. 161, 2023.
[3] N. Al-Kahtani, S. Alrawiai, B. M. Al-Zahrani, et al., "Digital health transformation in Saudi Arabia: A cross-sectional analysis," Digital Health, vol. 8, 2022.
[4] E. Laukka, M. Huhtakangas, T. Heponiemi, and O. Kanste, "Identifying the roles of healthcare leaders in HIT implementation: A scoping review," Int. J. Environ. Res. Public Health, vol. 17, no. 8, p. 2865, 2020.
[5] T. Austin, S. Chreim, and A. Grudniewicz, "Examining health care providers' and middle-level managers' readiness for change: A qualitative study," BMC Health Serv. Res., vol. 20, no. 1, p. 47, 2020.
[6] T. W. Schultz, "Investment in human capital," The American Economic Review, vol. 51, no. 1, pp. 1-17, 1961.
[7] G. S. Becker, Human Capital: A Theoretical and Empirical Analysis. Chicago, IL: University of Chicago Press, 1964.
[8] J. M. Burns, Leadership. New York, NY: Harper & Row, 1978.
[9] B. M. Bass, "From transactional to transformational leadership: Learning to share the vision," Organizational Dynamics, vol. 18, no. 3, pp. 19-31, 1990.
[10] J. M. Kouzes and B. Z. Posner, The Leadership Challenge, 6th ed. San Francisco, CA: Wiley, 2017.
[11] B. J. Weiner, "A theory of organizational readiness for change," Implementation Science, vol. 4, no. 67, pp. 1-9, 2009.
[12] R. Harrison, A. Chauhan, H. Le-Dao, et al., "Achieving change readiness for health service innovations," Nursing Forum, vol. 57, no. 4, pp. 603-607, 2022.
[13] D. L. Kirkpatrick, Evaluating Training Programs: The Four Levels. San Francisco, CA: Berrett-Koehler Publishers, 1994.
[14] F. D. Davis, "Perceived usefulness, perceived ease of use, and user acceptance of information technology," MIS Quarterly, vol. 13, no. 3, pp. 319-340, 1989.
[15] A. Sriharan, N. Sekercioglu, C. Mitchell, et al., "Leadership for AI transformation in health care organization: Scoping review," J. Med. Internet Res., vol. 26, e54556, 2024.
[16] A. T. Alanazi, "Digital leadership: Attributes of modern healthcare leaders," Cureus, vol. 14, no. 2, e21969, 2022.
[17] B. J. Weiner, A. S. Clary, S. L. Klaman, et al., "Organizational readiness for change: What we know, what we think we know, and what we need to know," in Implementation Science 3.0. Springer, 2020, pp. 101-144.

