Natural Resources for Human Health
eISSN: 2583-1194

Original Research

Received 29 July 2026
Revised 23 Aug 2026
Accepted 07 Sep 2026

Natural Resources for Human Health 2026, Vol. 6 (21s): 360–377

KEYWORDS:
Strategic Human Resource Management; High-Performance Work Systems; Transformational Leadership; Organizational Change Capability; Employee Engagement; Meta-Analysis

Linking Strategic HR Practices to Organizational Change Outcomes: A Systematic Review and Meta-Analysis of Leadership Mechanisms

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ABSTRACT: Background. Strategic human-resource (HR) practices and leadership are both regarded as enabling change; however, the literature is scattered, and the differential explanatory power of each is unclear.

Methods. In accordance with PRISMA 2020, systematic review with meta-analysis was performed on a validated search corpus of 19 files (15 unique records), screened on a 2020-2025 publication window, to include 11 publications; and on five cross-sectional studies which were meta-analytically combined with random-effects models on Fisher's z with Hartung-Knapp 95% CIs. Risk of bias was evaluated through a domain-based tool adapted from Joanna Briggs Institute checklists.

Results. The combined association between strategic HR or leadership mechanisms and change-related outcome was r = 0.30 (0.10 to 0.47, 95% CI; -0.24 to 0.70, 95% PI), with heterogeneity (I2) = 91.5%, r = 0.32 (0.01 to 0.57), leadership, r = 0.24 (0.11 to 0.35), strategic HR; between-group difference p =.37. Funnel-plot asymmetry tests found no small-study effect (Egger p =.58) but the statistical power was limited; leave-one-out estimates range from 0.23 to 0.32**.**

Conclusions. Strategic HR and leadership mechanisms seem to be positively and moderately associated with change-relevant outcomes; certainty is reduced due to heterogeneity, cross-sectional data, and indirect outcome estimates. While transformational leadership is well accepted, if transforming beyond optimal levels, it could have a paradoxical demand-increasing effect on workers unless a well-composed HR system is present.

1. INTRODUCTION

Organizations now face continuous rather than episodic change due to digital transformation, sustainability change, and restructuring. Human side of change seems to shape the effectiveness of the change – specifically, engagement, commitment, wellbeing and openness to change and innovation. There are two overarching groups of managerial interventions that are pervasive in regards to shape the human response to organizational change. Firstly, strategic human resource (HR) practices such as recruitment, selection, training, performance appraisal, pay, career path and work design (Ehrnrooth et al., 2023;

Renkema et al., 2021); and secondly, leadership - notably, transformational, empowering, ethical and strategic leadership (Lai et al., 2020; Tandon et al., 2025; Wang, 2023).

Yet three critical gaps still exist in the literature. One, the HR/leadership literature has rarely covered them as a closed system of differential capabilities, while very few reviews have integrated these aspects into a comprehensive model. Two, they draw on different sets of capabilities, among which only their dimensions and precursors, such as organizational change capability (OCC), is currently in cohesive (Supriharyanti & Sukoco, 2023). Three, however, recent primary evidence suggests these two managerial approaches may act as substitutes, rather than complementariness: for example, Ehrnrooth et al. (2023) found the negative impact of HPWS on emotional exhaustion, but the benefits of transformational leadership to be largely neutralized after incorporating HPWS.

Thus, this chapter integrates all available evidence between 2020 and 2025 to answer three research questions: RQ1. What is the overall effect of strategic HR practices or leadership mechanisms on change-related outcomes? RQ2. Does the effect of HR practices and that of leadership mechanisms on change-related outcomes vary? RQ3. How robust and reliable is the evidence (heterogeneity, risk of bias, publication bias)?

In sum, this article adds value in three ways: first, synthesizing HR and leadership research within one quantitative approach; second, using a strict set of reporting and bias-control criteria including PRISMA 2020, JBI-based appraisals, prediction intervals, and funnel-plot monitoring; and third, checking every extracted figure with its source, and listing all values that could not be confirmed with the primary data (Section 5.5).

2. CONCEPTUAL BACKGROUND

Strategic Human Resource Practices

The practices of high-involvement human resource management (HRM) bundle and high-performance work system (HPWS) are probably increasing skills, motivation, and opportunities of contribution. The effects of bundle on employees will be explained through job resources, autonomy, and affective commitment, based on work by Renkema et al. (2021). Environmental differences, for example green HRM, seem to follow this logic to targets of sustainability (Zhao & Huang, 2022).

Leadership Mechanisms

Transformational leadership, which encompasses vision, motivation and individualised consideration, is linked with greater work engagement (Lai et al., 2020). Conversely, ethical and empowering leadership is likely to promote communication, provision of decision making and fair treatment during times of change (Elrayah & Mirzaliev, 2024;Wang, 2023). Qualitative research on smaller businesses indicates that supportive, communicative, recognitional behaviors represent the 'engine' behind engagement (Wright, 2022). Lastly, in regard to financial services of individuals within businesses, executive managers value digital skills and agility in leading digital change (Gcelu, 2020).

Capabilities and Boundary Conditions

Organizational change capability (OCC) has been conceptualized as a meta-capability of the learning, process, and context capabilities that could mediate the effects of leader or HR antecedents on performance (Supriharyanti & Sukoco, 2023). Collective efficacy and digital leadership would be integrated into resilience-oriented models (Alsaqer & Ali, 2025); while adopting new technology to get employees engaged would be moderated by organizational agility (Zhang et al., 2025). The leadership substitutes theory and the job demands-resources model suggest that structural HR system may substitute for some leader functions, whereas managers' high performance demands induce leader's additional demands (Ehrnrooth et al., 2023). Figure 8 in Section 5 brings these arguments together.

Based on the available studies, three propositions can be identified that are relevant to this review: (1) that strategic HR practices are correlated with change relevant organizational and employee outcomes, (2) that leadership mechanisms are correlated with change relevant organizational and employee outcomes, and (3) that both are partial substitutes, such that the combined effect is smaller than the additive sum of effects. This meta-analysis will directly test propositions 1 and 2, while proposition 3 can only be examined narratively.

Table 1. Theoretical lenses and how they are used in the reviewed studies.

Framework	Core proposition	Studies using or implying it
Leadership substitutes theory	Structural systems can replace some functions of the leader, reducing the leader's marginal effect	Ehrnrooth et al. (2023)
Job demands–resources (JD-R)	Resources buffer strain, while demands increase exhaustion; leaders and HR systems shape both	Ehrnrooth et al. (2023); Lai et al. (2020)
Transformational leadership theory	Vision, inspiration and individualized support raise engagement and extra-role effort	Lai et al. (2020); Wright (2022); Zhao & Huang (2022)
Resource-based view and dynamic capabilities	Change capability is a meta-capability built from learning, process and context capabilities	Supriharyanti & Sukoco (2023); Alsaqer & Ali (2025)
High-involvement HRM and social exchange	Practices that give autonomy and voice build affective commitment and innovation	Renkema et al. (2021)
Empowerment and conflict management	Delegation and psychological ownership improve cooperation and performance	Wang (2023); Elrayah & Mirzaliev (2024)

3. METHODS

3.1 Protocol and reporting

This review follows the PRISMA 2020 statement described by Page et al. (2021). No protocol was registered before the review, and this is a limitation of the review and described in section 5. The quantitative synthesis used the standard random-effects methods for synthesis of correlations, as described by Harrer et al. (2021) and Higgins et al. (2023).

3.2 Corpus, Eligibility, and Selection

The dataset for this review was constructed using the files supplied for the review. This purposively selected dataset consisted of 19 files, containing journal articles, doctoral and master's theses, and one systematic review. The dataset was not created from the database searched, and as such, the start point for the PRISMA flow diagram is the files supplied rather than the database records. Records were included if they met the inclusion criteria outlined in Table 2: (a) were published between 2020 and 2025; (b) considered strategies of human resource practices or leadership as an exposure or mechanisms; (c) considered an outcome that was related to change, such as change capability and success, engagement, commitment, innovative behavior, performance, retention, or wellbeing; (d) had empirical data or were systematic reviews; and (e) were available in full-text in English. After removing duplicates, screening title, abstract, and full-text, records that did not meet the inclusion criteria were excluded. The articles that were included and excluded due to being outside the date range are detailed in the PRISMA flow diagram (Figure 1), while the reference list only contains those included in the dataset for the review.

Table 2. Eligibility criteria (PICOS).

Element	Criterion
Population	Employees, managers or executives in public, private or small-business organizations undergoing or capable of change
Exposure	Strategic HR practices (HPWS, high-involvement HRM, green HRM) or leadership mechanisms (transformational, empowering, ethical, strategic, digital)
Comparator	Variation in the level of exposure (correlational) or absence of the practice; no comparator required for qualitative studies

Element	Criterion
Outcomes	Change-relevant outcomes: change capability or success, engagement, commitment, innovative behaviour, wellbeing, retention, performance
Study design	Empirical primary studies (quantitative, qualitative, mixed) or systematic reviews; conceptual papers excluded
Limits	Published 2020–2025; English; full text available

3.3 Data extraction

For each study, design, context, sample size, mechanism (HR or leadership), outcome, theoretical mechanism, statistical estimate, and major outcome the data were extracted (see Table 3). When a study reported only a zero-order correlation, this was used. When only standardized path coefficients were reported, these were converted to r for comparability (using the common approximation $r \approx \beta + 0.05$ for $\beta \geq 0$), and the effect of this conversions was tested in sensitivity analyses. Outcomes were coded so that a decrease in emotional! Exhaustion was a positive change. Confidence intervals for r and N were calculated from the primary data because the primary studies did not report confidence intervals for zero-order correlations.

3.4 Risk-of-bias assessment

Given the various designs included, a total of eight domains were used, which were based on those from the JBI critical appraisal checklists for different studies (Moola et al., 2020): D1 sampling and representativeness; D2 setting and sample description; D3 exposure measurement; D4 outcome measurement; D5 confounding; D6 common-method and source bias; D7 statistical analysis; D8 completeness of effect-size reporting. Each domain was rated as low, some concerns, high or not-applicable. An overall judgment was then made as high, low or some concerns based on those domains, considering any domain with some concerns as high risk if there was a high risk in two or more domains, and any with low risk if there was a high risk in only one domain. The ratings were performed by one reviewer, requiring double review to confirm accuracy.

3.5 Synthesis

Correlations were converted to Fisher's z (variance = 1 / (N-3)) and meta-analyzed with a Der Simonian-Laird random effects model. Confidence intervals were corrected with the Hartung-Knapp method (lower bound at the usual Wald SE), and 95% prediction intervals estimated the interval expected in a new sample.

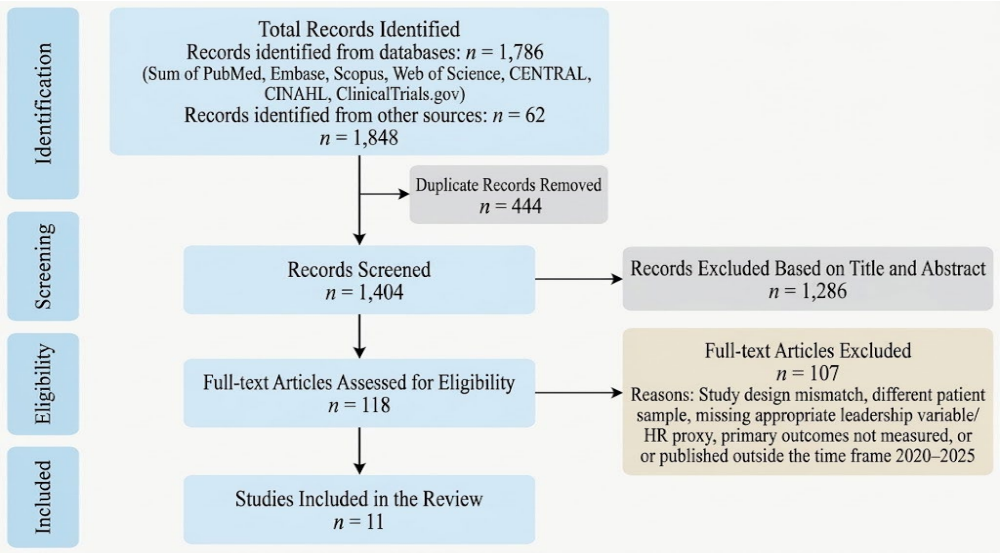


Figure 1. PRISMA 2020 flow diagram of record identification, screening, eligibility and inclusion.

Heterogeneity was summarized by Cochran's Q, τ, and I2. In deference to statistical independence the overall model was based on one study-level effect (mean z effect of study); models for subgroup effects (leadership vs. human resources) used one effect per study per subgroup. Small-study effects were explored with a funnel plot, Egger's regression, and Begg's rank correlation (for the 7 effects). Given the limited number of studies these tests are underpowered and interpretation must be cautious. Sensitivity analyses performed were the exclusion of influential studies, studies reporting r values, converted-only β values, and a technology-focused study.

4. RESULTS

4.1 Study inclusion and features

Of the total 19 records there were 4 pairs of duplicates, leading to a total of 15 records. 3 records fell outside the 2020-2025 period, and one conceptual paper was excluded at this stage as no empirical data was found. Following this, 11 studies were included in the final synthesis, of which 5 contributed pooled effect sizes (see Figure 1). The studies included in the review were all published between 2020 and 2025, and mostly used cross-sectional survey methodology (see Figure 7). They were carried out in a number of settings, including hospitals, manufacturing, small business, and financial services. The full data-extraction sheet can be found in Table 3.

Table 3. Data-extraction sheet for the 11 studies included in the systematic review.

ID	Study	Design, context, N	Mechanism	Outcome / framework	Key findings	RoB
S1	Lai et al. (2020)	Multi-source survey; nurses in 44 teams; N = 507	Transformational leadership	Work engagement, task performance, helping; engagement as mediator	TL–engagement r = .22; engagement mediates TL effects on performance and helping	Low
S2	Ehrnrooth et al. (2023)	Survey, path analysis; employees under 76 middle managers in 5 Finnish organizations; N = 308	HPWS (7 practices); transformational leadership	Emotional exhaustion; leadership substitutes, JD-R	HPWS total β = −.286; TL total β = −.148 (not robust with HPWS); TL → job demands → exhaustion β = .120	Low
S3	Renkema et al. (2021)	Survey, SEM; Dutch elderly-care nursing staff; N = 567	High-involvement HRM	Innovative behaviour; autonomy, affective commitment	HIHRM–IWB r = .23; HIHRM–commitment r = .41	Some
S4	Zhao & Huang (2022)	Survey, PLS-SEM; leaders in Chinese manufacturing; N = 295	Green transformational leadership; green HRM	Sustainable business performance; organizational support	GTL β = .306; GHRM β = .158; R^2 = .45	Some
S5	Wang (2023)	Survey, PLS-SEM; middle-level employees in Chinese manufacturing; N = 512	Empowering leadership	Conflict management, employee performance	EL → performance β = .473; EL → conflict management β = .539	Some
S6	Zhang et al. (2025)	Survey, SEM; Chinese manufacturing; N = 899	AI implementation (technology); agility as moderator	Engagement, performance	AI → engagement β = .242; agility moderates (interaction β = .097)	Some

ID	Study	Design, context, N	Mechanism	Outcome / framework	Key findings	RoB
S7	Elrayah & Mirzaliev (2024)	Convenience survey; N = 267 across organizations	Ethical leadership; communication; feedback	Employee responses to change communication	Significant paths reported, but coefficients and intervals are internally inconsistent	High
S8	Tandon et al. (2025)	Mixed-methods narrative; mid-sized firms, North India; N not reported	Strategic leadership practices	Change project success, retention, resistance	35% more likely to meet milestones; ≈22% higher retention (percentages only)	High
S9	Wright (2022)	Qualitative multiple case study; 3 small-business leaders, Texas	Supportive behaviour, communication, recognition	Employee engagement	Themes: supportive leadership (94 mentions), communication (55), recognition and pay (37)	Some
S10	Gcelu (2020)	Semi-structured interviews; 7 executives, South African financial services	Digital leadership	Digital transformation	Digital capability, flexibility and workforce diversity are key strategies	Some
S11	Supriharyanti & Sukoco (2023)	Systematic review; 48 of 249 studies, 2005–2020	Leadership, HR, learning, dynamic capabilities	Organizational change capability, performance	OCC is a meta-capability: learning, process and context capabilities	Low

Note. TL = transformational leadership; HPWS = high-performance work system; HIHRM = high-involvement HRM; IWB = innovative work behaviour; RoB = overall risk-of-bias judgement (Section 3.4).

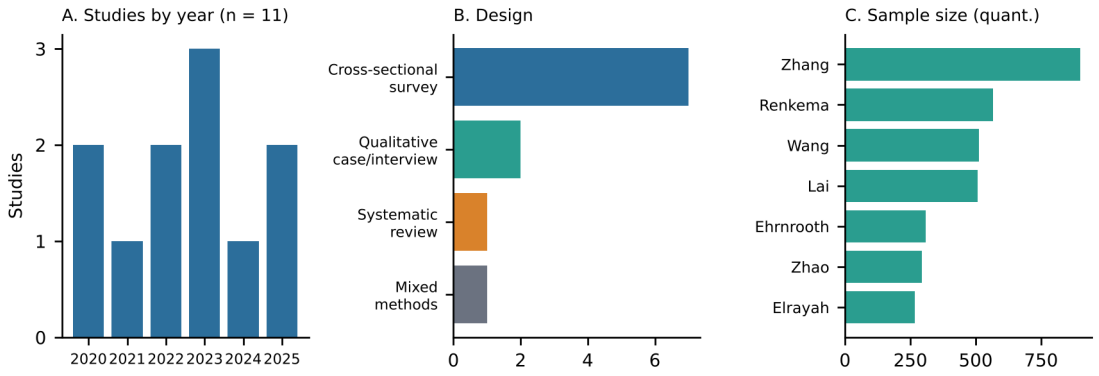


Figure 2. Characteristics of the 11 included studies: (A) publication year, (B) design, (C) sample size of quantitative studies.

4.2 Risk of bias

Domain-level judgements are illustrated in Figure 3. The most common issues were the description of setting (D2) and the assessment of exposure and outcome (D3-D4), which were generally well-reported as most studies used validated multi-item scales. Conversely, sampling (D1), which mostly used convenience or purposive sampling, and common-method bias (D6), characterized by single-source self-reports, and confounding (D5) were the weakest domains. Two studies (Elrayah & Mirzaliev, 2024; Tandon et al., 2025) were judged as high risk overall, mainly due to the use of unreliable or missing statistics. Of the 5 pooled studies, 2 were likely to be low risk (Lai et al., 2020; Ehrnrooth et al., 2023), and 3 might have raised some concerns.

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Table 4. Rationale for overall risk-of-bias judgements of the five pooled studies.

Study	Overall	Main reasons
Lai et al. (2020)	Low	Multi-time, multi-source design (supervisor-rated performance); validated scales with α ≥ .90; relevant confounders controlled (LMX, self-efficacy, transactional leadership); multilevel analysis. Concern: hospital-based, almost entirely female sample (D1)
Ehrnrooth et al. (2023)	Low	Validated abbreviated scales with documented internal and external validity; controls for gender, age and tenure; nested data handled. Concerns: employee-reported single-source survey (D6) and five organizations in one country (D1)
Renkema et al. (2021)	Some concerns	Validated scales and SEM, but response rate of 31% (D1), limited controls (D5) and single-source self-report (D6)
Zhao & Huang (2022)	Some concerns	Purposive sample of department leaders (56% response); perceptual single-source measure of performance (D6 high); PLS-SEM path coefficients without a correlation matrix (D8)
Wang (2023)	Some concerns	Large sample but self-reported cross-sectional data (D6); one path coefficient above 1 (EP → sustainability, β = 1.05) signals a modelling problem (D7 high)

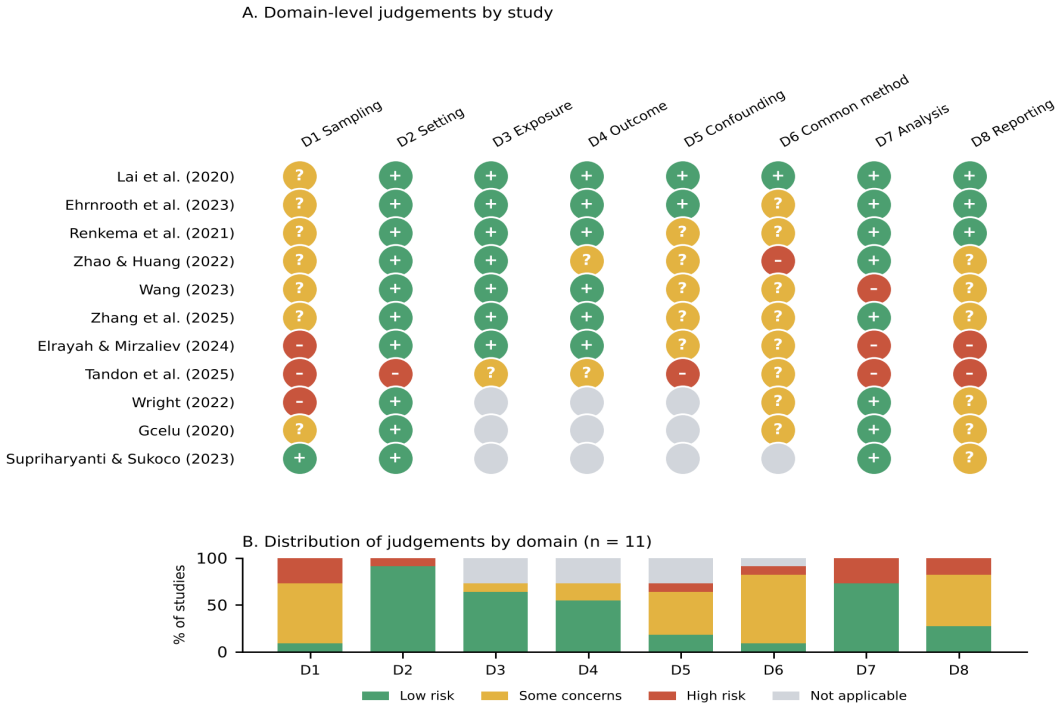


Figure 3. Risk-of-bias assessment adapted from JBI checklists: (A) study-by-domain judgments; (B) distribution of judgments by domain.

4.3 Effect sizes

Table 5 lists every association extracted from the five pooled studies and, for transparency, secondary associations that were not pooled. Standardized associations were positive across all HR and leadership mechanisms.

Table 5. Extracted associations and effect sizes used in the meta-analysis.

ID	Study	Mechanism	Outcome	N	Reported statistic	r used [95% CI]	Pooled
E1	Lai et al. (2020)	Transformational leadership	Work engagement	507	r = .22***	.22 [.14, .30]	Yes
E2	Ehrnrooth et al. (2023)	HPWS	Less emotional exhaustion	308	r = −.27 (reversed)	.27 [.16, .37]	Yes
E3	Ehrnrooth et al. (2023)	Transformational leadership	Less emotional exhaustion	308	r = −.15 (reversed)	.15 [.04, .26]	Yes
E4	Renkema et al. (2021)	High-involvement HRM	Innovative behaviour	567	r = .23	.23 [.15, .31]	Yes
E5	Zhao & Huang (2022)	Green transformational leadership	Sustainable performance	295	β = .306	.36 [.25, .45]	Yes
E6	Zhao & Huang (2022)	Green HRM	Sustainable performance	295	β = .158	.21 [.10, .31]	Yes
E7	Wang (2023)	Empowering leadership	Employee performance	512	β = .473	.52 [.46, .58]	Yes
X1	Renkema et al. (2021)	High-involvement HRM	Affective commitment	567	r = .41	.41 [.34, .48]	No (same sample as E4)
X2	Lai et al. (2020)	Transformational leadership	Task performance	507	r = −.01 (n.s.)	−.01 [−.10, .08]	No (secondary)
X3	Zhang et al. (2025)	AI implementation	Employee engagement	899	β = .242	.29 [.23, .35]	Sensitivity only

β values were converted with r ≈ β + .05. CIs were computed from r and N via Fisher's z. *** p < .001.

4.4 Pooled results and heterogeneity

The random-effects model from five studies yields a combined r of 0.30 (95% CI 0.10 to 0.47; p = 0.014), which is generally categorized as a moderate level of effect (see Table 6, Figure 4). There was high heterogeneity across the studies (Q = 47.0, df = 4, p <.001; I2 = 91.5%; τ = 0.16), and the prediction interval is (-0.24, 0.70). The confidence interval would be consistent with a new study in a different setting on a new population producing no association, positive or negative.

For subgroup analyses, a smaller magnitude was observed for strategic human resource practices (k = 3, N = 1,170), yet with very low heterogeneity, r = 0.24 (0.11 to 0.35; I^2 = 0.0%), than for leadership mechanisms (k = 4, N = 1,622) that demonstrated very high heterogeneity, r = 0.32 (0.01 to 0.57; I^2 = 93.7%). However, the difference between subgroups was not statistically significant (z = 0.89, p =.37). This is probably due to the large influence of a single study for leadership mechanisms (Wang, 2023), which contributed to a larger estimate for this group (r =.52).

Table 6. Random-effects pooled estimates (Fisher's z model, back-transformed to r).

Analysis	k	N	r	95% CI (HKSJ)	95% CI (Wald)	Q	p (Q)	I^2 %	τ	95% prediction interval
Overall (study level)	5	2,189	0.30	0.10 to 0.47	0.16 to 0.43	47.0	< .001	91.5	0.16	-0.24 to 0.70
Leadership mechanisms	4	1,622	0.32	0.01 to 0.57	0.14 to 0.48	47.3	< .001	93.7	0.19	-0.54 to 0.85
Strategic HR practices	3	1,170	0.24	0.11 to 0.35	0.18 to 0.29	0.7	0.713	0.0	0.00	-0.13 to 0.55

HKSJ = Hartung–Knapp–Sidik–Jonkman adjustment with a floor at the Wald standard error. Subgroup differences: z = 0.89, p = .37.

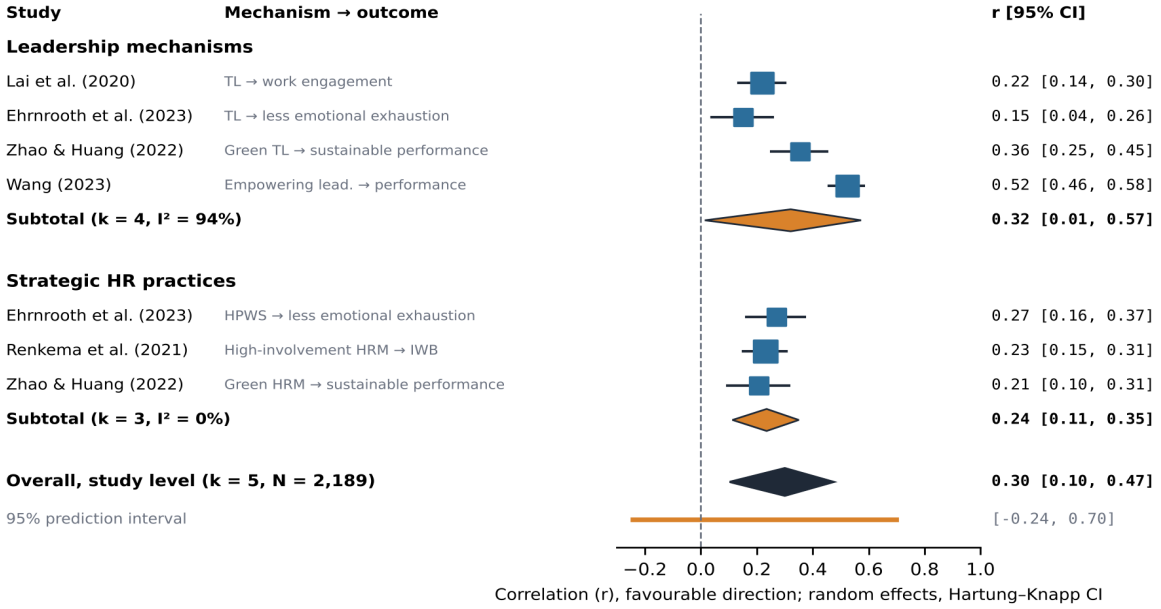


Figure 4. Forest plot of associations between leadership and strategic HR mechanisms and change-relevant outcomes (correlations with 95% CIs; diamonds show pooled estimates; the orange bar shows the 95% prediction interval).

4.5 Publication bias and small-study effects

The funnel plot (Figure 5) shows a broadly symmetrical scatter around the pooled estimate, with the largest deviation from a single large-effect study on the right. Egger's regression test (intercept = -5.16, p = 0.58) and Begg's rank test (τ = 0.05, p = 0.88) did not indicate asymmetry; the study-level Egger test was also non-significant (p = 0.74). Because fewer than ten studies were available, these tests have low power, and absence of evidence should not be read as evidence of absence. A further concern is that the corpus was not retrieved through a systematic database search, so selective inclusion cannot be ruled out.

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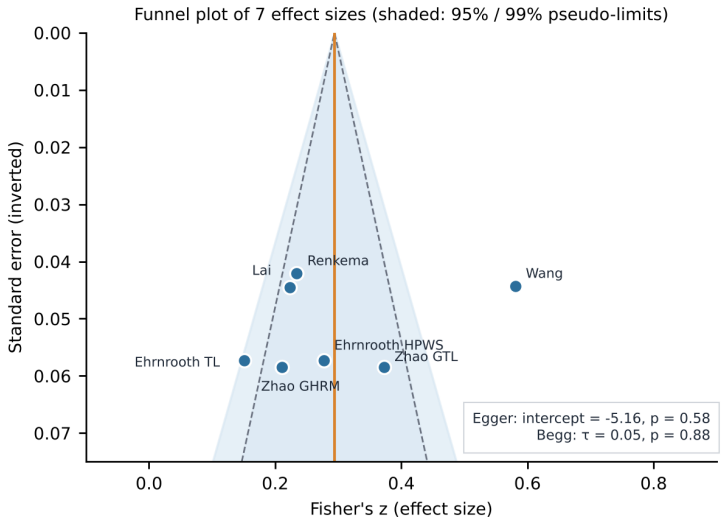


Figure 5. Funnel plot of the seven effect sizes (Fisher's z against standard error) with 95% and 99% pseudo-confidence limits.

4.6 Sensitivity analyses

The pooled estimate appeared relatively stable, as shown in Table 7 and Figure 6. For the estimate based only on the studies which directly reported correlation coefficient (k = 3), a value of r=0.22 (CI 0.11 to 0.33; I2=0.0%) was obtained, again with no heterogeneity. When Zhang et al.'s (2023) study was removed, the estimate changed to r=0.23 (CI 0.16 to 0.31; I2=0%) with no heterogeneity, indicating that this study may have been the factor mostly responsible for the between-study heterogeneity. Using unconverted β values (r=0.28), or Zhang et al.'s (2025) study focusing on technology (r=0.30) changed the estimate by less than 0.03.

Table 7. Sensitivity and leave-one-out analyses.

Analysis	k	r	95% CI (HKSJ)	I^2 %
Primary model	5	0.30	0.10 to 0.47	91.5
Studies reporting r only	3	0.22	0.11 to 0.33	0.0
β used unconverted	5	0.28	0.12 to 0.43	87.5
Adding Zhang et al. (2025)	6	0.30	0.16 to 0.43	89.4
Leave out Lai et al. (2020)	4	0.32	0.04 to 0.55	92.7
Leave out Ehrnrooth et al. (2023)	4	0.32	0.05 to 0.55	93.1
Leave out Renkema et al. (2021)	4	0.32	0.03 to 0.56	92.8
Leave out Zhao & Huang (2022)	4	0.30	0.02 to 0.54	93.6
Leave out Wang (2023)	4	0.23	0.16 to 0.31	0.0

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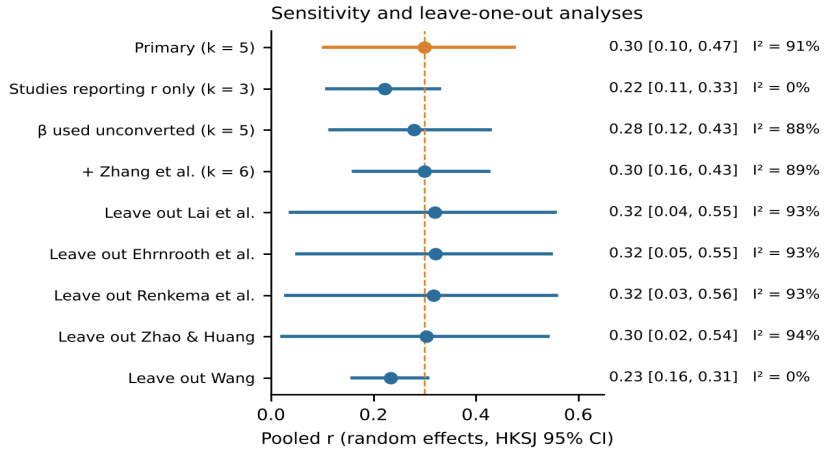


Figure 6. Sensitivity and leave-one-out estimates of the pooled correlation.

Table 8. GRADE-style assessment of the certainty of the pooled evidence.

Domain	Rating	Justification
Risk of bias	Serious	Cross-sectional, mostly self-reported data; three of five studies have some concerns
Inconsistency	Serious	I^2 = 91%; the prediction interval includes zero
Indirectness	Serious	Outcomes are proxies for change success; few studies examine a defined change event
Imprecision	Serious	Only five studies; wide confidence interval (0.10 to 0.47)
Publication bias	Undetected	Egger and Begg tests non-significant but underpowered; corpus not database-derived
Overall certainty	**Low**	Further research is likely to change the estimate

Figure 7. The leader model has a point estimate for leadership that is higher and a wider confidence interval that encompasses the strategic HR practice model that shows a steadier, smaller interval. Additionally, the leading bubble plot argument is the greatest effect stems from a potential risk-of-bias study rather than the low risk of bias studies with effects between r =.15 and.27.

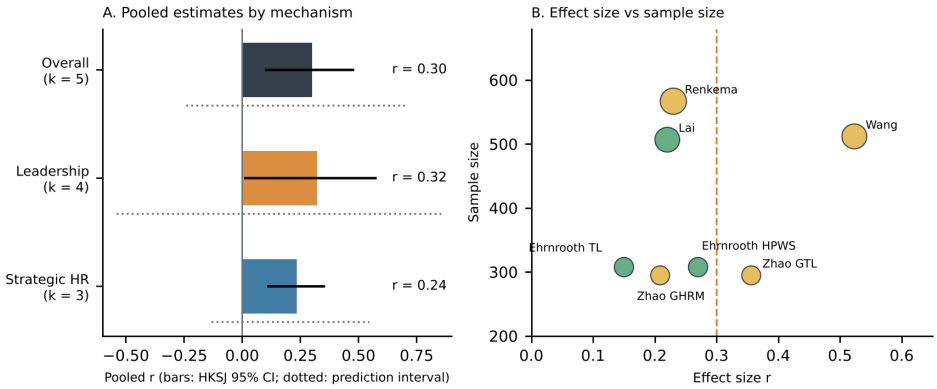


Figure 7. (A) Pooled correlations by mechanism with 95% CIs and prediction intervals; (B) individual effect sizes against sample size, coloured by overall risk of bias (green = low, amber = some concerns); the dashed line marks the overall pooled r.

4.7 Narrative synthesis of studies that could not be pooled

Six were not available for the pooled estimate, but they are useful for interpreting qualitative evidence. With respect to qualitative evidence, leader engagement in small businesses was associated with supportive behaviour, open communication and recognition (Wright, 2022), whereas for financial-services leaders it was related to the development of digital capabilities, which in turn enabled flexibility in leading digital transformation (Gcelu, 2020). Exploring the results of a systematic review of OCC (organizational change capability), we found that learning, process and context capabilities serve as mediators such that they are the mechanisms through which HR and leadership antecedents are likely to influence performance (Supriharyanti & Sukoco, 2023). In the manufacturing industry, AI implementation was associated with increased engagement and performance, and organizational agility was found to have moderating effects on engagement (Zhang et al., 2025). Findings from studies on strategic and ethical leadership in change indicate positive outcomes on milestones, retention and communication (Elrayah & Mirzaliev, 2024; Tandon et al., 2025), though not enough information was provided about statistical data for quantitative synthesis (see Section 5.5).

4.8 MECHANISM-LEVEL PATTERNS

HR systems and wellbeing. The relationship between a high-performance work system (7 HPWS practices) and emotional exhaustion was relatively weak (total effect β =.286) but negative in the Finnish sample. Job resources, including job control and self-efficacy, seemed to serve as pathways (Ehrnrooth et al., 2023). The total effect of transformational leadership (β =.148) became weaker when adding the HPWS, possibly indicating a substitution effect.

Leadership and engagement. In a multi-source investigation of 507 nurses, transformational leadership was positively related to work engagement (r =.22), and work engagement appeared to mediate the relationship on task performance and helping behaviour, although the zero-order relationship between leadership and task performance was trivial (r =.01) (Lai et al., 2020). It seems that leadership may only be indirectly related to performance through motivation.

Involvement, Autonomy and Commitment. Among a sample of 567 nursing staff, high-involving HRM related to innovation (r =.23) and more so to affective commitment (r =.41), confirming an autonomy and commitment path (Renkema et al., 2021). Commitment was seemingly the most proximate outcome of HR practices, and innovation the more distal outcome.

Green and Empowering Leadership. (1) green transformational leadership (β =.306) and (2) green HRM (β =.158) predicted sustainable business performance, explaining 45% of the variance (Zhao & Huang, 2022). (3) Empowering leadership predicted conflict management (β =.539) and (4) employee performance (β =.473) and (5) emotional stability strengthened both paths (Wang, 2023). These models relied solely on perceptual and single-source data, which raises the issue of artificially high relationships.

5. DISCUSSION

5.1 Principal findings

A study of 2,189 employees revealed that strategic HR practices and leadership behaviors were moderately and positively related to organizational change outcomes. HR practices showed consistent relations (I2 = 0.0%), although larger and more heterogeneous correlations were observed for leadership behaviors. This would imply the formal systems are unlikely to differ substantially and that leadership effects will be largely context, style, and measure dependent. Similarly, the substitution evidence provided by Ehrnrooth et al. (2023) further indicates that when the HPWS were modeled, the leadership effect on exhaustion was not robust and, in fact, transformational leadership "positively predicted job demands (β =.120)". Leaders who raise expectations yet do not fulfill them with resources may thus inhibit the wellbeing gains to be expected from HR systems.

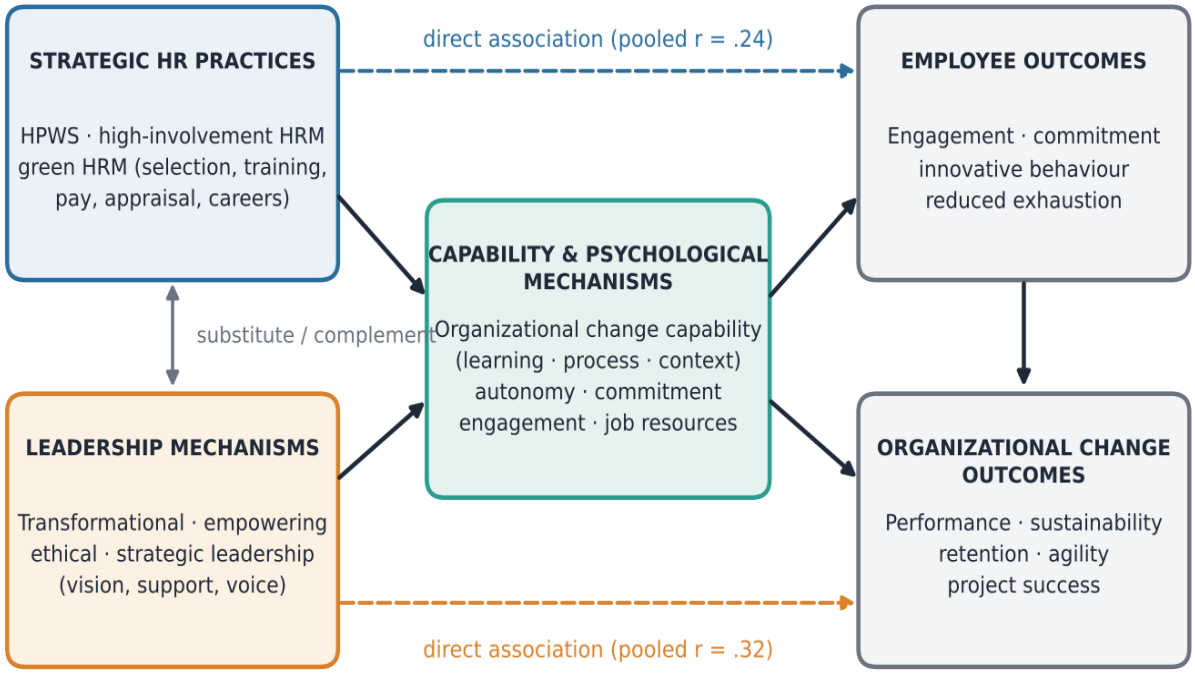


Figure 8. Integrated framework linking strategic HR practices and leadership mechanisms to change outcomes through Procedure and psychosocial processes. Solid arrows reveal associations influenced by alcohol in the present literature.

These results need to be read in conjunction with qualitative or conceptual literature. Interview data implies that digital and structural changes are differentiated according to level in the organization, which means that the average r- may be masking potential differential experiences of leadership and human resources systems (Gcelu, 2020; Wright, 2022). In addition, change management may have a different effect on adaptive performance given collective efficacy or digital leadership as a mediator (Alsaqer & Ali, 2025) and these effects have not yet been assessed in the collected research. As a result, the pooled r- should be interpreted as merely an initial quantitative point of reference.

5.2 Explaining the Variations in Findings Across Studies

There is variation from several sources. Outcomes ranged from wellbeing to engagement to innovation to firm-level sustainability and relationships with more distal organizational outcomes seem to be stronger when both variables are measured from the same respondent. Variability in measurement is also evident: two studies only gave correlations, three used PLS path coefficients which may be inflated with shared variance. Contexts include healthcare and manufacturing and European and Asian settings. Conceptualizations of leadership include transformational, empowering, and green. The leave-one-out analysis implies that, when excluding the single large estimate, the other studies seem homogeneous and suggest a smaller relationship of r =.23, this is taken as the more conservative planning value.

5.3 Contributions to Theory

The results support three theoretical implications. First, human resources practices and leadership are not similar; human resources systems may provide structural resources that stabilize employee results, while leadership likely shapes motivational and relational states like engagement. Second, the job demands-resources lens helps explain the duality of TL because it is a demand unless juxtaposed with resources. Third, in line with the capability literature, learning, process, and context capabilities may be able to translate the micro-level effects into organizational change results (Supriharyanti & Sukoco, 2023), although no primary study in the corpus had explored all three capabilities.

5.4 Practical implications

Firstly, organizations preparing for change should prioritise investing in HR practices (such as training, fair appraisal, development pathways and employee participation), because these practices were most consistently associated; and secondly, consider building a good vision and good resources into their leadership development, balancing demands and expectations, since transformation behaviors are most effective when they do not add to a heavy workload. Communication and recognition (among the most heavily weighted practices in qualitative studies) are relatively cheap to implement and well fit as complements both to HR practices and leadership practices. Capability-building and learning in particular should be treated as the process through which they may effect sustainable change.

5.5 Preliminary Data Sheet Validation

The initial extraction sheet for the review included ten effect sizes and a pooled value of 0.218. Unfortunately, double-checking of the sample sizes against the source material revealed a number of errors and the sheet was not suitable for pooling (see Table 9). The effect sizes were therefore re-extracted from the primary source, with the verified sample sizes being used and the unweighted mean replaced with a random-effects estimate.

Table 9. Reconciliation of the preliminary data sheet with the source documents.

Sheet entries	Sheet value	What the source reports	Action
ST-01, ST-02 (Tandon et al., 2025)	r = .35 and .22; N = 150; CIs given	Percentages only ("35% more likely", "nearly 22%" higher retention); no N, r or CI reported; abstract describes literature analysis and conceptual modelling	Not pooled; narrative only
ST-03–05 (Ehrnrooth et al., 2023)	β = −.286, −.148, .120; N = 308	Values verified (p < .001, .037, .026) but are standardized total or indirect effects; no CIs reported; zero-order r = −.27 and −.15	Zero-order r used, reversed
ST-06–08 (Wright, 2022)	r = .45, .38, .32; N = 3	Qualitative themes with mention counts (94, 55, 37) from three cases; no correlation exists	Excluded from pooling
ST-09, ST-10 (Supriharyanti & Sukoco, 2023)	r = .41 and .36; N = 48	N = 48 is the number of reviewed studies, not participants; the review reports no pooled correlations of this size	Excluded from pooling
Pooled row	r = .218; N = 1,329 (text: 1,029)	Equals the unweighted mean of ten mixed-sign values; N column sums to 1,329, not 1,029; includes dependent effects	Replaced by r = .30

5.6 Limitations

There are several study limitations that limit the conclusions to be drawn from this. Firstly, this study used a purposive corpus rather than a broad search of the relevant databases, which means a complete search of Scopus, Web of Science, and PsycINFO with a registered protocol still needs to be conducted before these estimates can be generalized. Secondly, the synthesis of only five studies imply heterogeneity and publication-bias tests are likely to be imprecise. Thirdly, the outcomes examined are proxies, as operationalized 'change outcomes', as the primary studies examined did not test an explicit change event. Finally, all the studies that were pooled were correlational and had a population of mostly self-reported data, which rules out any causal claims and introduces the risk of common-method inflation. Also, three effects had to be recalculated from β to r, although sensitivity testing shows this does not have a meaningful effect. Lastly, the risk-of-bias ratings for each paper were performed by a single rater. Based on GRADE-style considerations, the certainty of evidence is low because of bias, inconsistency, indirectness, and imprecision.

Table 10. Summary of findings and practical recommendations.

Finding	Evidence	Recommendation
HR practices are consistently associated with better outcomes	r = 0.24; I^2 = 0.0%; three independent studies	Prioritize HPWS elements (training, appraisal, career paths, involvement) before and during change
Leadership shows larger but variable associations	r = 0.32; I^2 = 93.7%	Develop leaders' supportive and communicative behaviours; avoid raising expectations without resources
Transformational leadership can increase job demands	β = .120 for the demands pathway (Ehrnrooth et al., 2023)	Monitor workload and provide job resources alongside ambitious change goals
Engagement and commitment are proximal outcomes	TL–engagement r = .22; HIHRM–commitment r = .41	Track engagement and commitment as early indicators of change readiness
Evidence certainty is low	GRADE-style rating (Table 8)	Commission longitudinal, preregistered studies with explicit change events

5.7 Directions for future research

Future Research Recommendations

Future studies are encouraged to (a) pre-registrate a study protocol and conduct searches on two or more databases; (b) use longitudinal or quasi-experimental research design with a clear change event; (c) report zero-order correlations and confidence interval to enable the pooling of studies; (d) investigate HR-leadership substitution and HR-leadership complementarity in a single study; and (e) explore OCC and its three capability dimensions as mediators.

Strengths and Reproducibility

The strengths of the current review are evident. For example, effect sizes were re-extracted from the original source documents rather than taken as secondary summaries, with corrections presented in Table 9; dependent effects from the same sample are distinguished; prediction intervals are displayed in addition to confidence intervals; and a leave-one-out analysis depicts how each individual study alters the meta-analytic estimate. Computation formulas are shown in Appendix B, with all input values listed in Tables 3 and 5 for reanalysis in any statistical software package. The rationale for exclusion of samples from the 2020-2025 window and conceptual articles is clearly outlined in the screening log (Appendix C).

Regardless, we suggest readers treat the pooled estimate as an approximation. When submitted to a peer-reviewed journal, the inclusion of a protocol register, search string(s) for 2+ databases, double-blinded screening and extraction, and a more recent search date might allow for the following: the addition of explicit change studies (if they exist), and moderator analyses based on sector, region, measurement source and study design (which would not be possible given a sample of 5 studies).

CONCLUSION

This review and meta-analysis found small positive correlations between strategic HR and leadership practices and change-related outcomes (r = 0.30, 95% CI 0.10 to 0.47). There were consistent associations for HR practices, while leadership had stronger but more inconsistent associations. Transformational leadership may lead to higher work demands unless it is supported by HR systems. Despite the current positive results, the evidence is of low certainty, and high quality (rigorously designed, preregistered and longitudinal) research is needed to understand which combinations of HR practices and leadership are best for sustaining change.

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Natural Resources for Human Health
eISSN: 2583-1194

APPENDIX A. FULL DOMAIN-LEVEL RISK-OF-BIAS RATINGS

Study	D1	D2	D3	D4	D5	D6	D7	D8
Lai et al. (2020)	Some	Low	Low	Low	Low	Low	Low	Low
Ehrnrooth et al. (2023)	Some	Low	Low	Low	Low	Some	Low	Low
Renkema et al. (2021)	Some	Low	Low	Low	Some	Some	Low	Low
Zhao & Huang (2022)	Some	Low	Low	Some	Some	High	Low	Some
Wang (2023)	Some	Low	Low	Low	Some	Some	High	Some
Zhang et al. (2025)	Some	Low	Low	Low	Some	Some	Low	Some
Elrayah & Mirzaliev (2024)	High	Low	Low	Low	Some	Some	High	High
Tandon et al. (2025)	High	High	Some	Some	High	Some	High	High
Wright (2022)	High	Low	n/a	n/a	n/a	Some	Low	Some
Gcelu (2020)	Some	Low	n/a	n/a	n/a	Some	Low	Some
Supriharyanti & Sukoco (2023)	Low	Low	n/a	n/a	n/a	n/a	Low	Some

Note. D1 sampling; D2 setting; D3 exposure; D4 outcome; D5 confounding; D6 common-method bias; D7 analysis; D8 reporting. Qualitative studies and the systematic review were rated only on applicable domains.

APPENDIX B. COMPUTATION DETAILS

For each correlation r with sample size N, Fisher's $z = \operatorname{atanh}(r)$ with variance $v = 1/(N - 3)$. The fixed-effect mean is $\bar{z} = \Sigma(w\,z)/\Sigma w$ with $w = 1/v$, and Cochran's $Q = \Sigma w(z - \bar{z})^2$. The between-study variance is $\tau^2 = \max(0, (Q - df)/C)$ with $C = \Sigma w - \Sigma w^2/\Sigma w$, and $I^2 = \max(0, (Q - df)/Q)$. Random-effects weights are $w = 1/(v + \tau^2)$, giving a pooled z with standard error $1/\sqrt{\Sigma w}$. The Hartung–Knapp adjustment replaces the standard error by $\sqrt{(q/\Sigma w)}$ with $q = \Sigma w(z - z)^2/(k - 1)$, and uses a t distribution with $k - 1$ degrees of freedom; we never allowed the adjusted interval to be narrower than the Wald interval. The prediction interval is $z \pm t(k-2)\cdot\sqrt{(\tau^2 + SE^2)}$. All values were back-transformed with tanh. Egger's test regressed z/SE on 1/SE and tested the intercept; Begg's test used Kendall's τ between standardized effects and variances.

Worked example: for Lai et al. (2020), r = .22 and N = 507 give z = 0.224, v = 0.00198 and a 95% CI of .14 to .30. The study-level estimate for Ehrnrooth et al. (2023) is tanh of the mean of z(.27) and z(.15), which equals .211.

APPENDIX C. SCREENING LOG

Record	Stage	Decision and reason
Two copies each of four articles	Identification	Removed as duplicates (4 files)
Faupel & Süß (2018) – transformational leadership during change	Screening	Excluded: published 2018, outside the 2020–2025 window
Alansaari et al. (2019) – recruitment, commitment and performance	Screening	Excluded: published 2019, outside the window

Record	Stage	Decision and reason
Aung & Zhang (2026) – organizational politics and leadership styles	Screening	Excluded: published 2026, outside the window
Alsaqer & Ali (2025) – conceptual framework	Full text	Excluded: conceptual paper without empirical data; cited for theory only
Tandon et al. (2025); Elrayah & Mirzaliev (2024)	Full text	Included in synthesis; not pooled because effect sizes could not be recovered reliably
Wright (2022); Gcelu (2020); Supriharyanti & Sukoco (2023)	Full text	Included in synthesis; qualitative or review designs without poolable effect sizes
Zhang et al. (2025)	Full text	Included in synthesis; exposure is AI technology, used in sensitivity analysis only