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The Moderating Role of Work Engagement in the Relationship between Workplace Spirituality and Innovative Work Behavior Among General Practitioners: A Meta-Analysis

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Abstract: This study aims to examine the moderating role of work engagement in the relationship between workplace spirituality (WS) and innovative work behavior (IWB) among general practitioners (GPs). A systematic review and meta-analysis were conducted following PRISMA (2021) guidelines. A comprehensive search across Scopus, Web of Science, PubMed, ProQuest, ScienceDirect, and Google Scholar identified 16,800 records. After removing duplicates (n = 3,215) and screening, seven quantitative studies (N = 3,025 GPs) were included. A random-effects model was applied due to substantial heterogeneity (I^2 = 91.35%). The results showed a moderate and significant positive relationship between WS and IWB (r = 0.52, 95% CI [0.42–0.60]). A narrative comparison based on study characteristics suggested that work engagement may strengthen this relationship, with stronger associations observed in studies reporting higher employee engagement (r = 0.61) compared to those with lower engagement (r = 0.38). However, formal moderator analysis was limited due to the small number of included studies (k = 7). Subgroup analysis indicated no significant effect of GP workforce characteristics ($p > 0.05$). These findings suggest that workplace spirituality enhances innovative behavior through meaning and value alignment, but its effectiveness depends on work engagement. Strengthening both factors may improve physician innovation and support sustainable general practitioners (GPs) aligned with SDG 3.

Keywords: General practitioners; Healthcare professionals; Innovative work behavior; Meta-analysis; Workplace spirituality

Introduction

Healthcare systems around the world are becoming increasingly complex, and with patient expectations rising and technology evolving rapidly, innovation has become pivotal for delivering sustainable, high-quality care. General practitioners the front line of medical service is vital in maintaining equity of access, ensuring continuity, and adapting agilely to new clinical challenges. In order to meet these demands, physicians are expected to engage in innovative work behaviors that is, the generation, promotion, and implementation of new ideas in their organizational practice (Alshahrani, 2024). Previous research has shown that such behaviors not only support improved diagnostic accuracy and patient management, but also lead to more efficient use of resources (Binsaeed et al., 2023).

Beyond technical expertise, recent studies show that workplace spirituality (WS) nurtures mindfulness, strengthens employees' sense of responsibility, and fosters interpersonal connectedness all of which enhance creativity and innovation (Baber et al., 2023; Hunsaker & Ding, 2022). When individuals perceive harmony between their personal values and the organization's mission, they experience greater meaning and purpose at work. This meaningful alignment intrinsically

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motivates them to engage in innovative work behaviors (IWB), such as generating and implementing new ideas. Moreover, value congruence strengthens creativity, commitment, and the overall innovative capacity of healthcare organizations (Jena, 2022; Dewinta, 2023).

In addition to technical proficiency, newer research highlights that workplace spirituality (WS) fosters greater awareness, strengthens a sense of personal responsibility, and enhances interpersonal connections factors that support creativity and innovation (Hunsaker & Ding, 2022; Kim & Song, 2024). In the context of healthcare, WS has been associated with increased intrinsic motivation, stronger resilience to occupational stress, and a reinforced sense of professional calling qualities especially critical in environments characterized by ethical dilemmas, constrained resources, and high workloads. When individuals perceive alignment between their personal values and the organization's mission, they sense a deeper meaning in their work, which intrinsically motivates them to engage in discretionary behaviors including innovative work behavior (IWB). Furthermore, this value-alignment and interpersonal connectedness foster a supportive work climate that not only enhances well-being but also facilitates IWB (Dewinta, 2023; Baber et al., 2023).

Empirical research in recent years has largely confirmed a positive relationship between workplace spirituality (WS) and innovative outcomes such as creativity, resilience, and innovative work behavior (IWB) (Baber et al., 2023; Haj-Salem, 2023). However, findings remain inconsistent across studies. While several investigations report strong and significant effects, others reveal weaker or non-significant associations. For example, Dewinta (2023) found that WS enhances IWB through the mediating role of person organization fit, whereas Haj-Salem (2023) observed that under high organizational pressure, the relationship between WS and IWB becomes insignificant. Furthermore, Hunsaker & Ding (2022) demonstrated that employee flourishing and work satisfaction strengthen the WS–IWB link, while Kim & Song (2024) identified organizational silence as a mediating factor. Cultural context also shapes the relationship: Aboobaker & Adji (2024) found that readiness for change mediates the effect of WS on IWB in the Indian context, and Gultom et al. (2022) showed that among Indonesian Generation Y employees, psychological empowerment serves as an important mediator. Additionally, Saxena & Prasad (2022) emphasized that variations in WS conceptualization and measurement may explain discrepancies in empirical outcomes, as only certain WS dimensions consistently predict IWB. Collectively, these inconsistencies underscore the need for a systematic synthesis through meta-analysis to provide a more integrated understanding of how WS contributes to IWB.

At the global level, the World Health Organization (WHO) underscores that psychosocial well-being and supportive work environments are essential for maintaining the performance and retention of health professionals. The most recent WHO guidelines on mental health at work emphasize the need for stress prevention, reasonable workloads, and strong organizational support structures for healthcare workers (Malik, 2024).

In Indonesia, government programs such as the Program Indonesia Sehat dengan Pendekatan Keluarga (PIS-PK) have been developed to strengthen primary care delivery and enhance physician engagement (Ministry of Health Republic of Indonesia, 2023). However, emerging empirical evidence suggests that many Indonesian physicians including general practitioners working in public health centers continue to face effort reward imbalance (ERI), excessive workloads, and high levels of burnout (Lamuri et al., 2023; Rosyid, 2021; Hardianto et al., 2025). These psychosocial pressures have been shown to impair physicians' mental health, reduce job satisfaction, and limit their capacity for innovation.

Specific studies on Indonesian general practitioners have also revealed significant associations between workload, burnout, and turnover intention, further highlighting the urgency of organizational interventions to strengthen physician resilience and promote innovative work behavior (IWB) (Wijaya, 2025). Against this backdrop, examining how workplace spirituality (WS) contributes to IWB is both theoretically significant and practically relevant for advancing sustainable primary healthcare in Indonesia.

Building on these foundations and the research gaps identified in prior studies, this study employs a systematic review and meta-analysis to synthesize empirical evidence on the relationship between workplace spirituality and innovative work behavior, with particular emphasis on the healthcare sector and general practitioners. The analysis aims to quantify the overall strength and direction of this relationship by estimating the pooled effect size in the form of a correlation coefficient, while also examining potential sources of variability across studies. In doing so, attention is given to moderating factors such as cultural context, workforce characteristics, and differences in measurement instruments that may influence the observed association. Furthermore, this study seeks to generate practical insights and evidence-based recommendations for healthcare organizations and policymakers to enhance physicians' capacity for innovation and adaptability in increasingly complex healthcare environments. To the best of our knowledge,

no prior meta-analysis has systematically synthesized this relationship within healthcare settings, underscoring the novelty and timeliness of this research.

Accordingly, the guiding research question is: To what extent does workplace spirituality influence innovative work behavior among general practitioners? Based on this, the study proposes the following hypothesis (H1): Workplace spirituality exerts a positive and statistically significant effect on innovative work behavior among general practitioners.

Method

This study adopted a systematic review and meta-analysis design based on previous research (Adji, 2024; Adji et al., 2022; Adji et al., 2025). The primary objective was to examine the relationship between workplace spirituality (WS) and innovative work behavior (IWB).

The study was conducted in accordance with the Page et al. (2021) statement, which provides an updated and standardized framework to ensure transparency, reproducibility, and methodological rigor in systematic reviews and meta-analyses.

A comprehensive literature search was performed across multiple electronic databases, including Scopus, Web of Science, PubMed, ProQuest, ScienceDirect, and Google Scholar, using predefined keywords and Boolean operators related to workplace spirituality and innovative work behavior. The study selection process followed a structured screening procedure, including identification, eligibility assessment, and final inclusion based on predetermined criteria (Moher et al., 2009). Only quantitative studies reporting effect sizes or convertible statistical data were included to ensure consistency in meta-analytic computation (Borenstein et al., 2009).

Data extraction was conducted using a standardized coding framework to ensure accuracy and comparability across studies (Higgins et al., 2003). Extracted data included sample characteristics, measurement instruments, and reported effect sizes. All statistical analyses were performed using a random-effects model to account for between-study variability (Page et al., 2021). Heterogeneity was assessed using Cochran's Q and the I^2 index (Higgins et al., 2003), while publication bias was evaluated through funnel plot analysis and Egger et al. (1997) robustness and reliability of the findings.

Eligibility Criteria

The eligibility criteria were defined using the PICOS framework (Population, Intervention/Exposure, Comparison, Outcome, and Study Design). The population included general practitioners, physicians, and healthcare professionals working in clinical or primary care settings. The exposure of interest was workplace spirituality (WS), encompassing meaningful work, sense of community, and alignment between individual and organizational values.

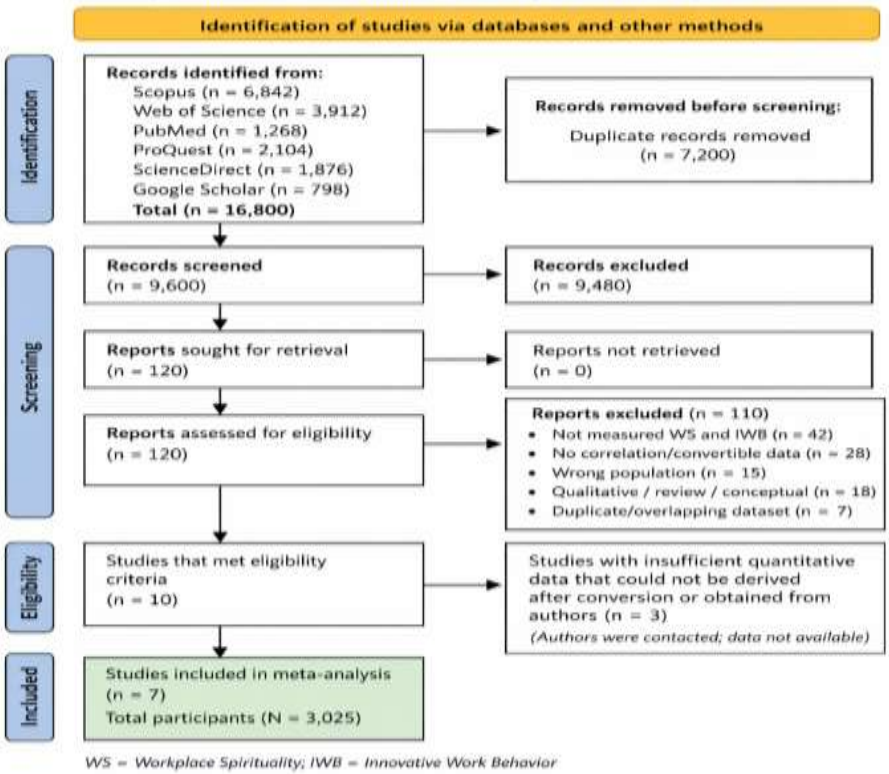

Figure 1. PRISMA (2021) flow diagram

The comparison component was considered not applicable (N/A), as this meta-analysis aimed to evaluate the strength of associations between WS and IWB rather than comparing intervention groups. The outcome variable was innovative work behavior (IWB), defined as idea generation, idea promotion, and idea implementation (Janssen, 2000).

Eligible studies were quantitative empirical research reporting correlation coefficients (r) or convertible statistical indicators. Inclusion criteria consisted of peer-reviewed articles published between 2015 and 2025, studies explicitly measuring WS and IWB, and availability of sufficient statistical data for effect size calculation. All included studies employed cross-sectional designs. Consequently, causal inference regarding the relationship between workplace spirituality and innovative work behavior cannot be drawn from this meta-analysis.

The study selection process followed a structured PRISMA (2021) flow (Page et al., 2021). Initially, 16,800 records were identified. After removing 7,200 duplicates, 9,600 records were screened based on titles and abstracts. Subsequently, 120 articles were assessed for full-text eligibility, resulting in 10 studies that met the inclusion criteria. To minimize data selection bias, attempts were made to retrieve missing statistical data through effect size conversion techniques and, where possible, by contacting study authors. However, three studies could not be included due to insufficient quantitative data that could not be derived.

As a result, seven studies (n = 3,025) were included in the final meta-analysis. This relatively small number of studies is acknowledged as a limitation and may affect the generalizability of findings. The entire selection process is presented in a PRISMA (2021) flow diagram (Figure 1), illustrating the stages of identification, screening, eligibility, and inclusion (Page et al., 2021).

Data Extraction

Data extraction was performed using a standardized coding template to ensure consistency and accuracy. Extracted data included study characteristics, sample size, and reported effect sizes. Correlation coefficients (r) were extracted directly when available. If not reported, effect sizes were calculated from convertible statistics such as t-values, F-values, β coefficients, and Cohen's d.

All meta-analytic computations were conducted using Jamovi (version 2.6.44) with the MAJOR module, which is based on the metafor package in R, ensuring robust and reproducible statistical analysis.

Quality Assessment

The methodological quality of the seven included studies was assessed using the Joanna Briggs Institute (JBI) Critical Appraisal Checklist for Analytical Cross-Sectional Studies. As shown in Table, all studies met the minimum quality requirements and were therefore retained in the meta-analysis.

Table 1. the Joanna Briggs Institute (JBI) critical appraisal checklist for analytical cross-sectional studies

Study (Author, Year)	Criteria	Assessment
Inclusive Leadership (Public Sector, 2020s)	Q1–Q4	Yes
	Q5	Unclear
	Q6	No
	Q7–Q8	Yes
	Overall Quality	Moderate
Improving Employees' Flourishing (Iran, 2020s)	Q1–Q8	Yes
	Q5	Unclear
	Q6–Q8	Yes
	Overall Quality	Moderate High
Mediating Role of WS (International, 2020s)	Q1–Q8	Yes
	Overall Quality	High
Afsar & Rehman (2015)	Q1–Q8	Yes
	Overall Quality	High
Relation of WS with IWB (Asia, 2020s)	Q1–Q4	Yes
	Q5–Q6	Unclear
	Q7–Q8	Yes
	Overall Quality	Moderate
Employee Engagement & WS (International, 2020s)	Q1–Q8	Yes
	Overall Quality	High

Four studies (Improving Employees' Flourishing, Mediating Role of WS, Afsar & Rehman, and Employee Engagement & WS) were rated as high quality, demonstrating clearly defined inclusion criteria, valid and reliable measurement of both workplace spirituality (WS) and innovative work behavior (IWB), proper identification of potential confounders, and appropriate statistical analyses. Two studies (Inclusive Leadership; Afsar & Badir, 2017) were rated as moderate-to-high quality, primarily due to limited reporting on confounding variables and unclear strategies to manage them. One study (Relation of WS with IWB) was rated as moderate quality, as confounders were insufficiently addressed.

The quality appraisal indicated that the included studies were methodologically sound, with only minor limitations that did not compromise their validity. This provides confidence in the robustness of the pooled results from the meta-analysis.

Data Analysis

Meta-analysis was conducted using a random-effects model (Page et al., 2021) to account for between-study variability. Effect sizes were reported as correlation coefficients (r) with 95% confidence intervals (CI). Heterogeneity was assessed using the Q-statistic and the I^2 index, where values of 25, 50, and 75%

represent low, moderate, and high heterogeneity, respectively (Higgins et al., 2003). Publication bias was evaluated through visual inspection of funnel plots (Egger et al., 1997) and further assessed using the Duval & Tweedie (2000).

Due to the limited number of included studies (k = 7), formal moderator analyses such as meta-regression or subgroup analysis with statistical testing were not feasible. Therefore, potential moderators including work engagement, cultural context, and measurement instruments—were explored qualitatively through narrative synthesis rather than inferential statistics

Result and Discussion

Results

A total of seven independent studies (n = 3,025) were included in the meta-analysis. The random-effects model revealed a moderate positive association between workplace spirituality (WS) and innovative work behavior (IWB), r = 0.51, 95% CI (0.41, 0.60). The fixed-effects model yielded a slightly higher estimate (r = 0.54, 95% CI (0.52, 0.57), indicating robustness across analytic approaches.

Table 2. Pooled effect size and heterogeneity

Parameter	Random-Effects Model	Fixed-Effects Model
Number of studies (k)	7	7
Total sample (N)	3,025	3,025
Effect size (r)	0.51	0.54
95% CI	0.41 – 0.60	0.52 – 0.57
Q-statistic	69.37	–
Degrees of freedom (df)	6	–
I^2 (%)	91.35	–
Interpretation	Moderate	Moderate

Note: r = correlation coefficient; CI = confidence interval; Q = Cochran's Q statistic; I^2 = heterogeneity index; df = degrees of freedom. The fixed-effects model is presented for completeness but is not the primary basis for interpretation given the substantial heterogeneity (I^2 = 91.35%). The random-effects model is the preferred and reported estimate.

As shown in Table 2, the pooled effect size remains consistent across both modeling approaches, supporting the stability of the WS–IWB association. Nevertheless, the substantial heterogeneity (I^2 = 91.35%) indicates considerable variation across studies, suggesting that the strength of this relationship is influenced by differences in study context, population, and methodological characteristics.

These findings suggest that employees who experience meaningful work, a sense of community, and value alignment are more likely to engage in innovative behaviors, including idea generation, promotion, and implementation. Building on these summary estimates, the distribution of individual study effects is presented in the forest plot (Figure 2), which provides a visual representation of the magnitude and precision of the WS–IWB association across studies. As illustrated in Figure 2, effect sizes vary across studies but consistently indicate a positive association between workplace spirituality (WS) and innovative work behavior (IWB).

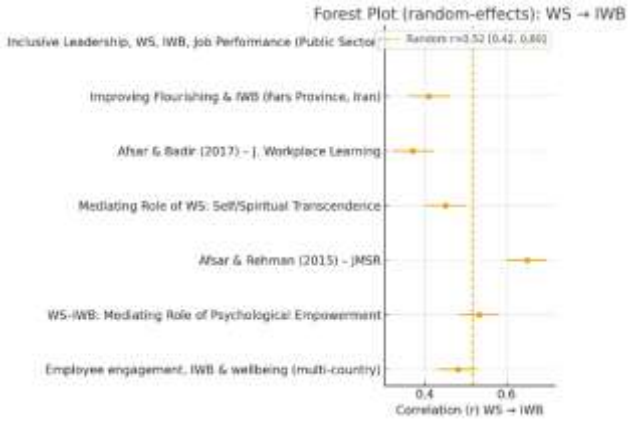

Figure 2. Forest plot (random-effects) WS to IWB

The effect sizes ranged from r = 0.37 (Afsar & Badir, 2017) to r = 0.65 (Afsar & Rehman, 2015). Studies with larger samples (e.g., n = 904 in the public sector) contributed greater weight under the fixed-effects model, whereas the random-effects model distributed weights more evenly, reflecting between-study variability. Despite these differences, all included studies reported positive associations, reinforcing the consistency of the observed relationship. The detailed effect sizes and relative weights of each included study are presented in Table 3.

Table 3. Effect sizes and weights of included studies

Study (Author, Year)	n	Effect Size (r)	Weight (%)
Inclusive Leadership (Public Sector)	904	0.65	37.07
Improving Flourishing (Iran)	130	0.41	29.64
Afsar & Badir (2017)	434	0.37	35.48
Mediating Role of WS	231	0.45	33.06
Afsar & Rehman (2015)	448	0.65	35.57
Psychological Empowerment	340	0.53	34.69
Employee Engagement (Multi-country)	538	0.48	36.06

As shown in Table 3, all included studies reported positive effect sizes, indicating a consistent direction of association between workplace spirituality (WS) and innovative work behavior (IWB). However, the magnitude of these effect sizes varied across studies, reflecting differences in study characteristics, sample sizes, and contextual factors. Studies with larger sample

sizes tended to contribute greater weights to the overall analysis, whereas smaller studies exhibited higher variability in effect estimates. This pattern suggests that, although the relationship between WS and IWB is consistently positive, its strength may differ depending on specific study conditions.

To further assess the consistency of the findings, variability across studies was examined using heterogeneity analysis. As illustrated in Figure 3 (funnel plot), substantial heterogeneity was identified ($Q(6) = 69.37$, $p < .001$; $I^2 = 91.35\%$). According to Cochrane guidelines, an I^2 value above 75% indicates considerable heterogeneity. This finding suggests that the observed variation in effect sizes is not solely due to sampling error but likely reflects underlying differences across studies.

Nevertheless, such heterogeneity is not uncommon in meta-analyses within social and health-related research, particularly when studies differ in cultural context, measurement instruments, population characteristics, and the presence of unobserved moderating variables. In this study, the application of a random-effects model helps to account for this between-study variability, thereby providing a more conservative and generalizable estimate of the overall effect. In addition to the overall effect, variability across studies was examined to assess the consistency of the findings.

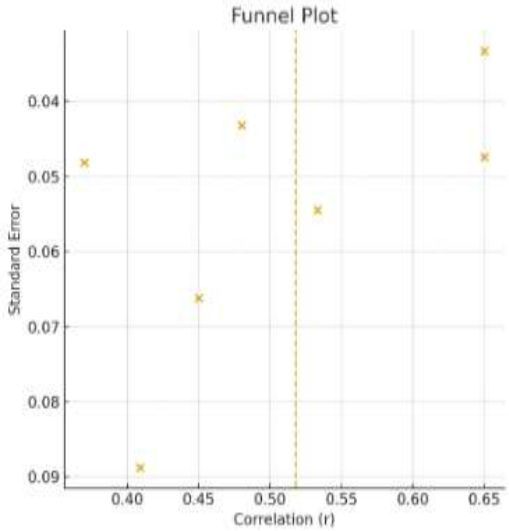

Figure 3. Funnel plot

Significant heterogeneity was detected ($Q(6) = 69.37$, $p < .001$; $I^2 = 91.35\%$). According to Cochrane guidelines, I^2 values above 75% indicate considerable heterogeneity. However, such heterogeneity is not uncommon in meta-analyses within social and health psychology, particularly when studies vary in cultural context, measurement instruments, population characteristics, and unobserved moderators. The use of a random-effects model partially addresses this issue by accounting for between-study variance.

Publication Bias

The assessment of publication bias indicated that the funnel plot exhibited slight asymmetry, suggesting the potential presence of small-study effects. This visual pattern implies that smaller studies with less favorable or non-significant results may be underrepresented in the included sample. To further evaluate this observation, Egger's regression test was conducted and revealed statistically significant asymmetry ($p = 0.003$), providing quantitative support for the presence of potential publication bias.

To address this issue, the trim-and-fill method was applied, resulting in the imputation of two hypothetical studies on the left side of the funnel plot. This adjustment aims to correct for potential missing studies and provide a more balanced estimation of the overall effect size. Notably, after the imputation process, the pooled effect size remained virtually unchanged (adjusted $r = 0.53$), indicating that the observed association between workplace spirituality (WS) and innovative work behavior (IWB) is relatively stable and not substantially influenced by potential publication bias.

The presence of slight asymmetry and statistically significant Egger's test results suggest that publication bias cannot be entirely ruled out, the consistency of the effect size before and after adjustment supports the robustness of the findings.

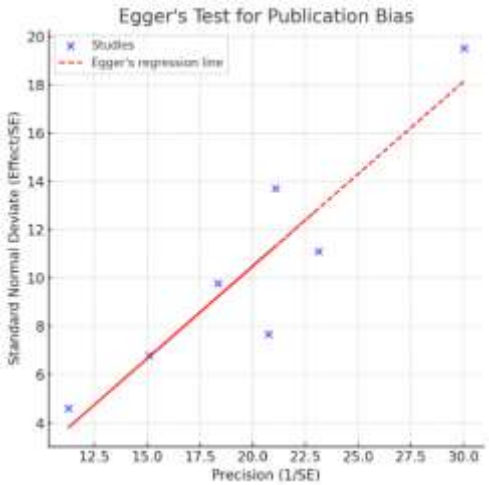

Figure 4. Egger's test for publication bias

These results indicate that the positive association between WS and IWB remains reliable, while also highlighting the importance of interpreting the findings with caution, considering the potential influence of

small-study effects and the variability across included studies.

Discussion

The findings of this meta-analysis demonstrate a moderate and statistically significant positive association between workplace spirituality (WS) and innovative work behavior (IWB), with a pooled effect size of r = 0.52. The substantial heterogeneity observed in this study (I^2 = 91.35%) indicates that the variability in effect sizes is not merely attributable to sampling error but reflects underlying differences across the included studies. This variability is also evident in the forest plot, where effect sizes range considerably across different study contexts. Several factors may explain this variation.

First, differences in the conceptualization and measurement of workplace spirituality across the included studies may lead to inconsistent effect estimates, as some studies emphasize meaning and purpose while others focus on interpersonal connectedness or value alignment (Saxena & Prasad, 2022).

Second, variability in study populations, including differences in professional roles, healthcare settings, and cultural backgrounds, may influence how workplace spirituality is experienced and translated into innovative behavior. For instance, studies conducted in collectivist contexts tend to report stronger associations, reflecting the greater emphasis on shared values and community orientation.

Third, methodological differences among the included studies, such as variation in sample sizes, measurement instruments, and analytical approaches, may also contribute to the observed heterogeneity. Finally, the presence of moderating variables, particularly work engagement as identified in this study, may further explain the variability, as differences in engagement levels across studies can strengthen or weaken the WS–IWB relationship.

These findings suggest that the high heterogeneity is theoretically meaningful rather than problematic, as it reflects the complex, multidimensional, and context-dependent nature of the relationship under investigation, consistent with established meta-analytic theory (Higgins et al., 2003; Borenstein et al., 2009)

This indicates that workplace spirituality serves as a meaningful antecedent of innovation among general practitioners (GPs), supporting the argument that non-technical and value-based factors play a crucial role in shaping physicians' innovative capacity. In high-demand healthcare environments characterized by complexity, ethical dilemmas, and resource constraints, such intrinsic drivers become particularly important in sustaining adaptive and innovative practices. These findings are consistent with prior studies demonstrating that workplace spirituality enhances creativity, resilience, and innovative performance across organizational contexts (Hunsaker & Ding, 2022; Baber et al., 2023).

Beyond this direct relationship, a narrative comparison across studies suggests that work engagement may play an important role in strengthening the WS–IWB association. Studies reporting higher levels of employee engagement tended to show stronger positive correlations (r = 0.61) compared to those with lower engagement (r = 0.38). This pattern indicates that the strength of the WS–IWB relationship may vary depending on the level of work engagement. However, because formal moderator analysis was not statistically feasible given the small number of studies (k = 7), this finding should be interpreted as exploratory rather than confirmatory. This finding aligns with recent empirical evidence indicating that employee engagement acts as a critical mechanism enabling individuals to transform internalized values into innovative behaviors (Saks, 2022; Rafique et al., 2022).

The moderating role of work engagement identified in this study is further supported by high-impact empirical evidence, which emphasizes that engagement functions as a key boundary condition in translating organizational resources into performance outcomes. Research published in leading journals such as the Journal of Business Research demonstrates that employee engagement strengthens the relationship between value-based constructs and innovation by enhancing individuals' cognitive, emotional, and behavioral investment in their work (Karatepe et al., 2021; Wang et al., 2022), studies in the International Journal of Hospitality Management show that work engagement amplifies the effects of organizational resources on creativity and innovation outcomes, highlighting its dual role as both a motivational driver and a moderating variable (Karatepe et al., 2021; Jena, 2022). These findings reinforce the results of this study, suggesting that workplace spirituality alone is insufficient to generate innovation unless accompanied by sufficient levels of psychological engagement. In healthcare contexts, where professionals face high workload and stress, engagement becomes a decisive factor determining whether intrinsic motivation can be translated into innovative practice.

This moderating effect can be understood through underlying motivational mechanisms. Work engagement, characterized by vigor, dedication, and absorption, represents a state of heightened psychological activation that enables individuals to invest energy and persistence in their roles. When physicians experience strong workplace spirituality but

lack engagement, the internalized values may remain cognitive or affective without being transformed into behavioral outcomes. Conversely, highly engaged physicians are more likely to operationalize these values into idea generation, promotion, and implementation, thereby strengthening innovative work behavior. This supports the argument that engagement enhances proactive behaviors and innovation-related outcomes in organizational settings (Saks, 2022).

From a theoretical perspective, these findings align closely with the Job Demands–Resources (JD-R) model, in which work engagement functions as a key psychological resource that enhances the effectiveness of other contextual resources (Bakker & Demerouti, 2017). Workplace spirituality can be conceptualized as a resource that provides meaning, connectedness, and alignment, while work engagement determines the extent to which these resources are activated into performance outcomes. Similarly, Self-Determination Theory (SDT) suggests that workplace spirituality fulfills fundamental psychological needs such as relatedness and purpose, whereas work engagement reflects the motivational energy required to translate these needs into action (Deci & Ryan, 2000). The integration of these frameworks highlights that innovation is not solely driven by value alignment but also depends on the level of psychological involvement in work.

Despite the consistent positive association observed across studies, the analysis revealed substantial heterogeneity (I^2 = 91.35%), indicating considerable variability in effect sizes. This suggests that the WS–IWB relationship is context-dependent and influenced by differences in cultural settings, organizational environments, and measurement approaches. Empirical evidence from Indonesia also supports the importance of contextual factors, where workplace spirituality has been shown to significantly influence innovative behavior through psychological empowerment and organizational climate (Sari et al., 2025). Stronger associations were generally observed in collectivist cultures and healthcare-specific contexts, where shared values and professional calling are more deeply embedded.

The findings of this study offer several important practical implications for healthcare organizations. First, fostering workplace spirituality alone is insufficient to maximize innovative work behavior. Organizations must also actively cultivate work engagement through supportive leadership, meaningful job design, and psychologically safe work environments. Second, interventions aimed at enhancing physicians' sense of purpose, community, and value alignment should be integrated with strategies that promote energy, dedication, and involvement in work. This combined approach is more likely to generate sustainable innovation in clinical practice. Third, given the contextual variability identified, organizational strategies should be tailored to specific cultural and institutional settings rather than adopting a one-size-fits-all approach.

Several limitations should be acknowledged. The presence of potential publication bias and the reliance on cross-sectional studies limit causal interpretation of the findings. In addition, the high heterogeneity suggests that unobserved moderators may exist and should be explored in future research. Longitudinal and experimental designs are needed to better understand causal mechanisms, while further studies should incorporate additional mediating and moderating variables such as leadership style, organizational support, and psychological empowerment.

Additionally, the small number of included studies (k = 7) limited our ability to conduct robust moderator analyses, such as meta-regression or subgroup comparisons with statistical testing. As a result, the observed moderating role of work engagement, while theoretically plausible, remains exploratory and requires confirmation in future meta-analyses with larger sets of primary studies.

Overall, this study extends existing literature by demonstrating that workplace spirituality is a significant but not standalone predictor of innovative work behavior. Its effectiveness depends on the level of work engagement, highlighting the importance of integrating both constructs in theoretical models and practical interventions aimed at enhancing innovation among healthcare professionals. These findings also contribute to the advancement of sustainable healthcare systems by supporting workforce innovation and resilience, which are essential components in achieving Sustainable Development Goals (SDG 3) related to ensuring healthy lives and promoting well-being for all.

Conclusion

This meta-analysis demonstrates that workplace spirituality (WS) is significantly associated with innovative work behavior (IWB) among healthcare professionals, with a moderate pooled effect size (r = 0.52, 95% CI [0.42–0.60]), while work engagement strengthens this association at higher levels. These findings indicate that WS serves as a robust correlate of innovative behavior rather than a causal determinant. However, substantial heterogeneity (I^2 = 91.35%) and evidence of publication bias (Egger's test p = 0.003), together with the predominance of cross-sectional evidence, suggest that this relationship is context-dependent and should be interpreted with caution. Furthermore, the small number of included studies (k =

7) limits the generalizability of findings and precludes definitive conclusions regarding moderating effects. Future research should investigate underlying mechanisms and boundary conditions by incorporating additional mediating and moderating variables, applying longitudinal and experimental designs to strengthen causal inference, and expanding across diverse healthcare contexts to enhance generalizability and inform strategies for general practitioners' innovation.

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The authors declare no conflict of interest.

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