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Workplace Mental Health in Construction: Evaluating Leadership Awareness and Response

Shafayet Ahmed [1,*], Md Tauhidul Karim [1], Osama Abudayyeh [1] and Wael Alruqi [2]

[1] Department of Civil and Construction Engineering, Western Michigan University, Kalamazoo, MI 49008, USA; mdtauhidul.karim@wmich.edu (M.T.K.); osama.abudayyeh@wmich.edu (O.A.)
[2] Civil Engineering Department, College of Engineering, Jouf University, Sakaka 72388, Saudi Arabia; waelalruqi@ju.edu.sa
* Correspondence: shafayet.ahmed@wmich.edu

Abstract

Challenging work conditions and a predominantly male workforce have intensified concerns about worker well-being in the U.S. construction industry. Although these issues are increasingly acknowledged, empirical evidence on how management perceives and addresses employees' psychological needs remains limited. This study seeks to fill that gap by examining managerial awareness and responsiveness to workplace mental health challenges, as well as the implementation of targeted well-being interventions across construction organizations. A mixed-methods approach was employed, integrating quantitative data from a nationwide survey of construction professionals with qualitative insights from open-ended responses. Results indicate that workers experience moderate levels of psychological strain, with notable differences across demographic and occupational groups. Women, non-white professionals, and site supervisors reported higher stress and lower overall well-being, emphasizing the need for more inclusive and tailored interventions. While both senior leaders and frontline supervisors demonstrated moderate awareness of these challenges, supervisors were perceived as less consistent in taking action to address them. Among existing workplace practices, transparent compensation structures and opportunities for skill diversification were identified as the most established supports for well-being. In contrast, mentoring programs, employee recognition, and open feedback mechanisms emerged as promising yet underutilized strategies. Overall, the study contributes by shifting attention from documenting construction-related mental health stressors to understanding how leadership recognition is translated into organizational response. Therefore, the findings provide practical guidance for construction leaders seeking to strengthen workers' well-being and build a more resilient work environment.

Keywords: workforce mental health; workforce well-being; psychological safety; organizational culture; management engagement; management awareness

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1. Background

The construction industry is a vital pillar of the global economy, contributing over $10 trillion to the global gross domestic product (GDP), making it one of the largest and most economically influential sectors worldwide [1]. Within the United States, the construction sector employs approximately 7 million individuals and represents an annual market value of roughly $1.36 trillion [2]. In 2021 alone, it accounted for approximately 4.3% of the U.S. GDP [3]. However, the industry is increasingly recognized as a high-risk industry

for mental health deterioration [4]. A growing body of evidence points to alarming trends in worker well-being. Recent findings report that 83% of U.S. construction professionals have experienced some form of mental health concern, including anxiety, depression, or work-induced stress [5]. Tragically, suicide rates in this industry are among the highest of any occupational group, with more than 5000 construction workers dying by suicide annually, nearly five times the number of fatalities attributed to physical jobsite accidents [6]. The sector also leads to substance misuse and overdose-related deaths, underscoring the scale and urgency of the crisis [7]. Approximately half of all construction professionals report experiencing frequent symptoms of anxiety or depression, well above the national average [6].

Despite the magnitude of these issues, mental health has historically received significantly less emphasis in construction safety programs compared to physical safety hazards. Traditional occupational safety frameworks have primarily focused on preventing the "Fatal Four"-falls, electrocutions, struck-by injuries, and caught-in/between incidents. In contrast, mental health considerations have often been overlooked in organizational safety strategies [8,9]. This gap is concerning, given that work-related stressors and poor mental health not only impair individual well-being but also compromise safety performance, labor productivity, and project delivery outcomes [10,11].

Leadership and organizational management play an essential role in bridging this gap. Research has shown that top management's commitment and involvement are critical to the successful implementation of well-being initiatives [12–14]. Organizational-level interventions that target psychosocial hazards, such as excessive job demands, lack of control, and unsupportive supervisory relationships, can mitigate the risks associated with burnout, anxiety, and stress [15]. In the construction context, management's actions set the tone for workplace culture and can directly influence mental health outcomes [4]. By encouraging open communication, fostering psychological safety, and promoting consistent well-being practices, leadership can embed mental health as a core element of job-site management, on par with physical safety.

Although the role of leadership in promoting worker well-being has been conceptually acknowledged, little empirical research has investigated the extent to which construction company managers are aware of or responsive to mental health challenges among their workforce [4,12]. Specifically, there is a lack of data examining how management perceives workplace stressors and their level of engagement in implementing targeted well-being strategies. To address this critical knowledge gap, the present study aims to evaluate construction management's awareness and responsiveness to workplace mental health issues. This research examines key well-being intervention strategies identified in prior studies and evaluates the extent to which these strategies are supported and implemented by management personnel within construction organizations. By doing so, the study seeks to inform future efforts to strengthen mental health outcomes and promote holistic worker well-being across the construction industry.

2. Literature Review

The following sections offer comprehensive insights into the mental health issues in the construction industry, along with organizational strategies to address them.

2.1. Mental Health Issues in the Construction Industry

Mental health in the workforce has emerged as a critical global concern due to its significant implications for sickness absence, early retirement, and overall productivity [16,17]. Characterized by its inherent complexity, dynamic pace, and confrontational working conditions, the construction sector is widely recognized for inducing elevated stress levels [18].

Workers frequently experience psychological strain stemming from intense productivity demands, physically taxing tasks, and the transient, nomadic nature of the job [19,20]. The sector has some of the highest global rates of suicide and mental health disorders, mainly due to persistent occupational stressors [21]. In the U.S., suicide rates among low-skilled construction workers are more than four times higher than the national average [22]. This trend is not isolated to the U.S.; similar patterns are evident globally. For instance, in Australia, suicide accounts for one in six fatalities in the construction industry [19], while in the United Kingdom, the suicide rate is 3.7 times higher than the national average, with over half of construction workers reporting a history of mental health challenges [21]. Historically, the focus in construction health and safety research has centered on physical hazards. However, mental health is increasingly acknowledged as a critical area requiring attention [23]. The COVID-19 pandemic further exacerbated these issues, bringing added stressors such as job insecurity, increased workloads, social isolation during remote work, and difficulties adapting to home-office arrangements [24]. Moreover, studies show that subclinical mental health conditions like stress [23], burnout [25], and elevated depressive symptoms [26] are also widespread in the construction industry [20].

2.2. Presence of Psychosocial Stressors in the Construction Industry

Recent research has greatly expanded knowledge of the psychological and social risks that contribute to mental health problems in the construction sector. Three large-scale review studies analyzing a total of 93 scholarly works document the widespread nature and serious consequences of work-related stressors across construction environments [19,27,28]. These reviews consistently identify long working hours, heavy workloads, accelerated work schedules, unfavorable site conditions, intense time pressures, unclear or conflicting job roles, employment instability, and strained workplace relationships as dominant sources of stress. In addition, Tijani et al. (2021) emphasized excessive job demands, substandard physical conditions, and inconsistent role expectations as key contributors to psychological distress [20]. Building on this body of work, Sun et al. (2022) proposed a detailed framework consisting of fourteen categories of psychosocial risk, organized into two main groups: high job demands and insufficient job resources [27]. Stressors related to high demands include competing role expectations, unclear responsibilities, employment insecurity, interpersonal tensions, work overload and underload, cognitive strain, and safety-related pressures [29]. In contrast, limited job resources involve weak organizational support, inadequate compensation and recognition, restricted autonomy, limited opportunities for career advancement, insufficient training, and perceived unfairness within organizations. Using focus group methods, Fordjour et al. (2021) identified 42 occupational factors associated with mental health difficulties [30]. Similarly, Ahmed et al. (2022) examined the experiences of ethnic minority workers and classified major sources of stress into four interconnected areas: personal circumstances, job tasks, and organizational practices [31].

In addition to general occupational pressures and organizational constraints, discriminatory practices constitute a significant and distinct source of psychological strain. Women employed in construction frequently encounter workplace cultures and institutional norms that range from implicitly biased to openly exclusionary [32]. The continued dominance of men in the industry often compromises both safety and emotional well-being. For example, much protective equipment is designed primarily for male body types, leaving many women without properly fitting gear [33]. Moreover, pervasive interpersonal and structural sexism heightens stress levels and restricts career development opportunities [34].

In a similar vein, Chan (2013) reported that racial and ethnic minorities, along with other marginalized groups, face disproportionately high levels of bullying and mistreatment compared with workers in many other industries [35]. LGBTQ workers are also

frequently subject to stereotypes that question their suitability for construction work and leadership roles, fostering exclusion and emotional strain. Differences in language and cultural background further contribute to psychosocial risk. Ahmed et al. (2022) found that interactions between supervisors and Hispanic workers on U.S. construction sites are often disrupted by cultural misunderstandings, limiting effective communication and collaboration [31].

2.3. Managerial Awareness and Organizational Support for Mental Health

A growing body of research highlights the critical role of organizational support in safeguarding professionals' mental health in construction project environments. Key dimensions of this support include assistance from colleagues and supervisors, comprehensive management systems, and perceptions of organizational fairness, all of which have shown a positive correlation with improved psychological well-being among project management professionals [28]. Organizational structures, including workplace safety culture and climate, as well as human resource practices, profoundly influence the nature and intensity of job demands at the task level, often resulting in emotional burnout when inadequately managed [36]. Contemporary empirical studies continue to reinforce the centrality of demand-resource imbalances as a driver of mental health challenges in the workplace [37,38]. For example, Bowen et al. (2014) demonstrated that both job control and organizational support significantly reduce stress among construction consultants [39]. Niedhammer et al. (2021), in a comprehensive meta-analysis of 72 studies spanning two decades, found robust links between workplace stressors and adverse health outcomes, including depression and cardiovascular disease [40]. Loneliness in the workplace has been linked to diminished job performance, lower levels of organizational citizenship behavior, and weaker organizational commitment [41]. Research by Gilmer et al. (2023) underscores the importance of cultivating meaningful workplace relationships, particularly through supportive interactions with supervisors [42]. This is echoed in findings from Sawhney et al. (2023), which showed that clear and compassionate communication from managers helped buffer the mental health impact of social isolation during hybrid work arrangements brought on by the COVID-19 pandemic [43]. Social connectedness and a strong sense of belonging in the workplace have also been associated with lower incidences of post-traumatic stress symptoms [44]. Given that many adults spend a substantial portion of their lives at work, the workplace becomes a crucial setting for fostering positive mental health through enhanced interpersonal interactions and support systems. The supervisory relationship, in particular, plays a pivotal role in employee well-being, making it a strategic target for mental health interventions [45,46]. Foundational elements for nurturing social connection, such as consistent, enriching interactions with supervisors and peers, are inherently embedded in the workplace environment [47].

2.4. Workplace Intervention and Best Practices for Workers' Well-Being

Leadership behavior, managerial priorities, and institutional policies strongly influence how psychosocial risks are recognized and managed within work environments [10]. Leaders who demonstrate active engagement and supportive practices can significantly limit harmful behaviors such as discrimination, harassment, and workplace aggression [48]. In contrast, weak supervision or passive management often enables these problems to persist [49]. Studies by Golzad et al. (2023) and LaMontagne et al. (2014) indicate that inadequate emotional and professional support from supervisors and colleagues is closely associated with negative mental health outcomes [50,51]. At the organizational level, employers have a critical responsibility to reduce psychosocial risks through the establishment of clear guidelines and the provision of appropriate support mechanisms. These include

strict anti-harassment policies, secure and confidential complaint procedures, and access to professional mental health services [4,52].

Alongside organizational measures, workplaces increasingly rely on employee-focused mental health initiatives as part of broader well-being programs. Common approaches include employee assistance services, structured psychological skills training, peer mentoring systems, resilience-building workshops, mindfulness and relaxation techniques, stress reduction education, health promotion activities, and wellness awareness campaigns [53–56]. These interventions function both as preventive tools and as support mechanisms by enhancing coping capacities and enabling early identification of psychological distress [57]. Practices such as mindfulness training, relaxation exercises, and resilience development offer workers practical methods for managing stress and recovering from emotional fatigue [58]. In addition, peer-based support systems help strengthen workplace relationships by encouraging open dialogue, reducing stigma around mental health, and fostering a sense of collective responsibility [59]. Evidence from multiple systematic reviews consistently shows that individual-centered mental health programs produce beneficial effects, underscoring their importance within integrated organizational well-being frameworks [19,29,60].

3. Point of Departure and Research Objectives

Existing studies have documented numerous intervention approaches aimed at promoting employee wellness at both the organizational and individual levels [53–57]. Despite these advances, limited evidence exists regarding how construction practitioners view such initiatives or whether current programs effectively address the unique mental health pressures associated with discrimination-related psychosocial stress experienced on job sites [12]. Much of the prior literature has concentrated on identifying and measuring workers' exposure to occupational stressors, while comparatively little attention has been given to managerial perspectives on workforce well-being [48]. In particular, there is insufficient understanding of how organizational leaders recognize, prioritize, and respond to the underlying conditions that affect employees' mental health. Meaningful and sustained improvements in worker well-being cannot rely solely on grassroots or employee-driven efforts [57]. Instead, they require strong, informed leadership and a deliberate commitment to applying research-based practices that reduce psychosocial risks and strengthen workplace support systems.

Although prior studies have extensively documented psychosocial stressors, demographic differences in mental health outcomes, and the importance of managerial support in construction, limited attention has been given to how these concerns are recognized and translated into organizational action. The present study addresses this gap by examining management awareness and responsiveness as two related but distinct dimensions of organizational support. Awareness refers to leaders' recognition of workers' mental health concerns [13], whereas responsiveness reflects the extent to which organizations convert such recognition into targeted well-being practices [9]. This distinction provides a leadership-focused perspective on construction mental health and extends existing theoretical discussions by moving beyond the identification of stress outcomes toward understanding how psychosocial risks are acknowledged and addressed within organizational settings. Based on this theoretical positioning, the present study addresses the following research questions:

- RQ#1: To what extent are company leaders aware of mental health concerns affecting construction professionals on job sites?
- RQ#2: How actively do company leaders implement targeted measures to enhance the overall well-being of construction professionals?

To investigate these questions, a nationwide survey was conducted among construction professionals throughout the United States. The survey evaluated the level of awareness among senior management and frontline supervisors regarding mental health challenges in the workplace. It also gathered managerial assessments of the relevance, practicality, and current adoption of six targeted intervention strategies identified in previous research [9,12,48,61]. Analysis of the survey data offers insight into the degree of leadership involvement in mental health initiatives and the organizational capacity to introduce meaningful, system-wide improvements. By emphasizing managerial responsibility and leadership-driven action, this study contributes to the expanding body of literature on mental health in construction. Furthermore, it underscores the central role of company leadership in creating psychologically supportive work environments and provides actionable guidance for industry stakeholders seeking more effective responses to the sector's mental health challenges.

To achieve the goal of the present study, the selected well-being strategies were positioned within a theoretical framework established through the literature review, as discussed earlier. The framework conceptualizes six literature-informed strategies across four organizational levels and three construction project phases to clarify how management awareness can be translated into organizational responsiveness. At Level 1, central administration and top management are responsible for organization-wide commitments, including corporate policy statements and fair recruitment and promotion practices, because these strategies establish formal expectations, equity-oriented procedures, and institutional commitment before project-level implementation begins [48,62]. At Level 2, project or site management, including project managers and site managers, is positioned as the level where organizational commitments are translated into visible employment conditions through pay transparency and competitive salary practices [27]. At Level 3, frontline supervisors, such as foremen and safety officers, are positioned closer to workers' daily experiences through strategies such as skill diversity and well-being programs, which support coping capacity, inclusion, and perceived organizational support [41,51]. Level 4 represents workers and all site personnel, who are the primary recipients of the strategies implemented at higher organizational levels.

It should be noted that the framework separates the strategies analytically by organizational level and project phase rather than treating them as direct causal relationships. During pre-construction, the strategies are positioned as prerequisites and planning measures; during construction, they are implemented, enforced, and monitored; and during commissioning or between projects, they are reviewed and updated to inform future organizational and project practices. Therefore, the framework follows a cyclical logic in which lessons from one project can refine policies, compensation practices, and worker-support programs in later projects. Since perceived management awareness and responsiveness may differ across respondent roles, demographic characteristics, and organizational contexts, the present study examines these perceptions across demographic and organizational groups. However, a phase-based evaluation of the effectiveness of the six well-being strategies across pre-construction, construction, and commissioning stages remains outside the scope of the present study. Instead, the phase-based and level-based structure provides a theoretical lens for evaluating whether construction professionals perceive management as aware of workplace mental health concerns and responsive in supporting well-being strategies at the organizational level. Figure 1 presents the conceptual theoretical framework used in the present study.

	Phase 1 Pre-construction	**Phase 2** Construction	**Phase 3** Commissioning
Level 1 Central Administration (Top management)	Corporate Policy Statement; Fair Recruitment and Promotion (Prerequisite and planning)	Corporate Policy Statement; Fair Recruitment and Promotion (Enforced and monitored)	Policy Review and Update
Level 2 Project or Site Management (PMs, Site managers)	Pay Transparency; Competitive Salary (Prerequisite and planning)	Pay Transparency; Competitive Salary (Enforced and monitored)	Compensation Review and Update
Level 3 Frontline Supervisors (Foreman, Safety officers)	Skill Diversity; Well-being Programs (Prerequisite and planning)	Skill Diversity; Well-being Programs (Enforced and monitored)	Program Review and Update
Level 4 Workers (All site personnel)	*Strategies established at all levels above take effect at worker level.*	*Strategies established at all levels above take effect at worker level.*	*Strategies established at all levels above take effect at worker level.*

Figure 1. Theoretical framework with respect to well-being strategies used for the study.

4. Research Method

The research methodology for this exploratory study was systematically designed following an in-depth review of the existing literature and a critical analysis of current challenges affecting the well-being of construction professionals. The study adopted a mixed-methods research design. This approach enabled both quantitative and qualitative insights, ensuring the methodological robustness necessary to address the study's objectives. A semi-structured survey was developed as the primary data collection instrument. Prior to its deployment, the survey underwent iterative refinements, which included expert validation through consultations with industry professionals, experts in workforce development, and well-being. These consultations ensured that the questions were contextually accurate, clearly worded, and capable of capturing nuanced perspectives from diverse stakeholders. Institutional ethics approval was obtained from the Institutional Review Board (IRB), ensuring that all research activities involving human subjects adhered to ethical standards. Figure 2 presents a visual summary of the methodological framework applied in this research, capturing the sequential flow from strategy identification through data analysis and synthesis of findings.

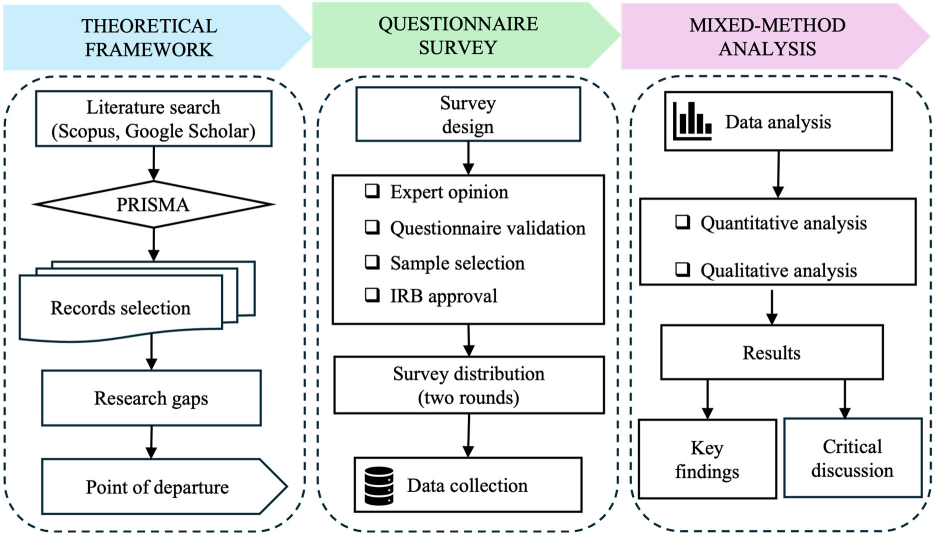


Figure 2. Research flow.

4.1. Systematic Literature Review

A comprehensive and structured literature search was conducted to examine research on mental health, psychosocial stressors, managerial awareness, organizational support, and well-being interventions in the construction industry. Publications from 1990 to 2025 were reviewed to capture more than three decades of scholarly development in this area. The search was conducted in Scopus and Google Scholar between March 2025 and December 2025. These databases were selected because they provide broad coverage of construction engineering, management, occupational health, and workplace well-being research.

Search keywords were developed through background scoping and applied using combinations of construction-related, mental health-related, and management-related terms. To ensure methodological transparency and reproducibility, the review followed the PRISMA 2020 reporting guidelines [63]. Records were screened in sequential stages, including database identification, duplicate removal, title and abstract screening, and full-text eligibility assessment. Table 1 summarizes the search keywords and exclusion criteria applied at each stage of the review process.

Table 1. Search keywords and exclusion criteria used for literature screening.

Review Stage	Search Keywords and Exclusion Criteria
Database search	Sample search keywords: "construction AND mental health," "construction AND stressors," "construction AND stress OR burnout," "construction AND discrimination OR bias," "construction AND psychosocial OR psychological," "construction AND well-being OR wellness," "construction AND management OR leadership," and "construction AND workplace culture OR intervention."
Initial scope filtering	Exclusion criteria: (1) Records published outside 1990–2025; (2) Non-English publications; (3) records outside construction engineering, construction management, occupational health, or workplace well-being; (4) Non-scholarly documents such as editorials, keynote papers, discussion articles, technical notes, reports, and theses.
Duplicate removal	Duplicate records identified across Scopus and Google Scholar were removed before title and abstract screening.
Title and abstract screening	Exclusion criteria: Records with no clear relevance to construction workplace mental health, psychosocial stressors, management awareness, organizational support, or well-being interventions.
Full-text eligibility assessment	Exclusion criteria: (1) Studies that did not report or discuss mental health-related outcomes; (2) Studies did not address management or organizational support; (3) studies lacked relevance to construction workplace practice; (4) Studies did not provide sufficient conceptual or empirical basis for theoretical synthesis.
Final inclusion	Studies meeting the scope, relevance, and quality criteria were retained for theoretical synthesis.

Broad keyword combinations initially identified 1030 records from Scopus and Google Scholar. After duplicate removal, 718 records were retained for title and abstract screening. Records were excluded at this stage if they did not address mental health, psychosocial stressors, construction workplace settings, or management-related intervention practices. The remaining 105 records were assessed through full-text screening. Studies were excluded during full-text assessment if they did not provide mental health-related outcomes, did not examine management or organizational support, or lacked sufficient relevance to construction workplace practice.

It should be noted that the screening process was structured around a clearly defined scope and exclusion criteria to maintain the quality and relevance of the reviewed literature. For example, only peer-reviewed journal articles and scholarly conference papers were retained, while editorials, keynote papers, discussion articles, technical notes, reports, theses, and other non-scholarly documents were excluded. During full-text assessment, studies were further evaluated based on their relevance to construction workplace settings, clarity

of methodological or conceptual contribution, connection to mental health or psychosocial stressors, and discussion of management or organizational support. Therefore, the final set of publications was selected not only based on keyword relevance but also on scholarly quality, methodological transparency, and alignment with the study objectives. Through this process, 72 publications were retained for theoretical synthesis. Figure 3 presents the PRISMA flowchart showing the identification, screening, eligibility, and inclusion stages.

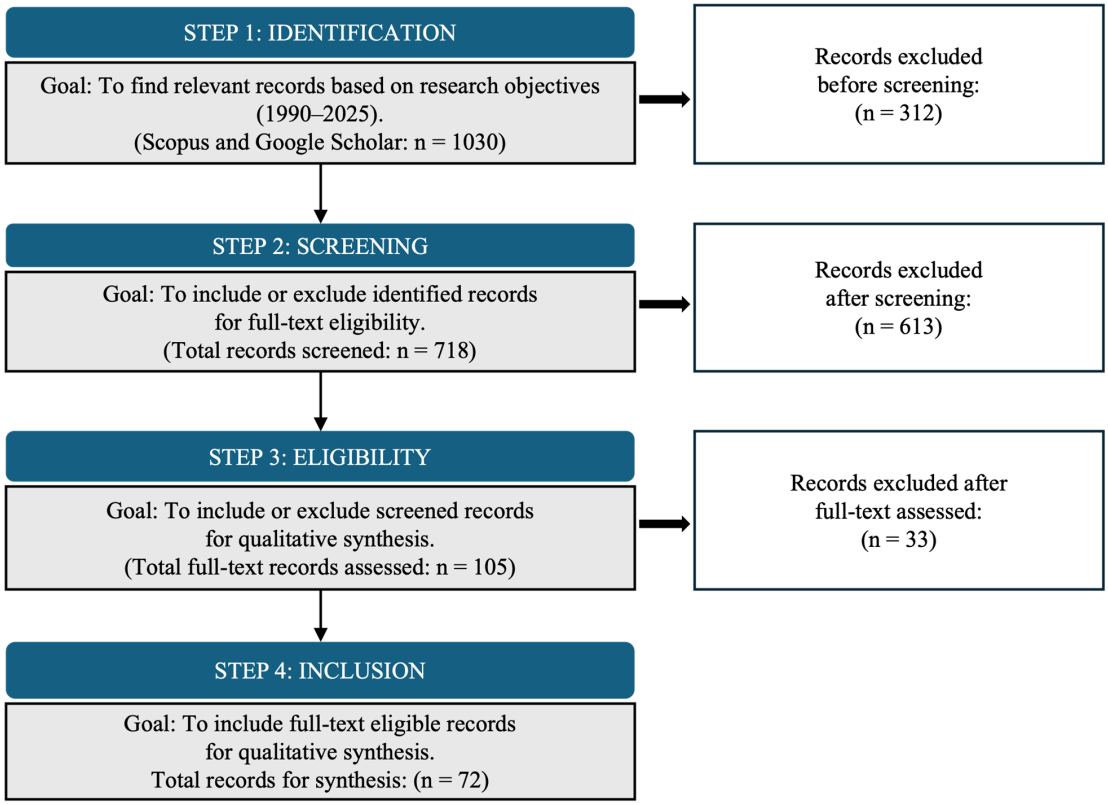


Figure 3. PRISMA framework for literature search.

4.2. Survey Design

The structured survey comprised 18 questions, organized into three sections to provide a comprehensive understanding of the research themes. The first section focused on collecting detailed demographic information from participants, such as their professional role, years of industry experience, company size, geographic location, and organizational tier. Ensuring demographic diversity was crucial to capturing a broad spectrum of perspectives and minimizing bias associated with homogeneous respondent profiles. The second section explored the mental health climate within participants' respective workplaces. This included items that assessed respondents' personal experiences related to mental well-being, as well as their perceptions of supervisory and upper management's awareness and commitment to mental health support in the workplace. A total of six questions were added to this section to illustrate the participants' mental health, work stress, and perceptions of management's awareness to reduce mental health stressors. To strengthen the reliability and validity of the responses, several questions in this section were adapted from the National Institute for Occupational Safety and Health Quality of Work Life Questionnaire, an established and widely used instrument in occupational health research [64].

The third section examined the extent to which company management was responsive to the adoption and implementation of targeted well-being strategies. This part of the survey consists of seven questions on management's response to implement six predefined well-being strategies to reduce mental health stressors at the workplace.

4.3. Sample Selection

A stratified sampling strategy was employed to recruit approximately 700 construction professionals, ensuring representation from general contracting firms, specialized subcontractors, consulting organizations, and construction and design companies. Participants also reflected a wide range of professional roles, including project managers, facility managers, project engineers, site engineers, designers, and other industry practitioners. To develop a comprehensive sampling pool, multiple sources were utilized, including membership databases from professional associations, staff directories published on company websites, publicly available profiles of construction professionals on platforms such as LinkedIn, and the research team's existing professional contacts. The research team collaborated with several industry organizations, such as the American Society of Civil Engineers (ASCE), Associated General Contractors (AGC), Associated Builders and Contractors (ABC), National Association of Women in Construction (NAWIC), and the American Subcontractor Association (ASA), to circulate the survey through email campaigns and organizational newsletters.

4.4. Survey Distribution and Data Collection

The survey questions were compiled using the Qualtrics online survey platform. Survey invitations were distributed electronically to prospective participants identified through the finalized contact database. From the initial list of approximately 700 individuals, 250 entries were eliminated due to various data quality issues, including inaccuracies during data extraction (n = 100), invalid or inactive email addresses (n = 75), and missing or incomplete professional profile information (n = 75). As a result, the final distribution list consisted of roughly 450 verified contacts with confirmed professional credentials. In total, 56 responses were submitted by eligible participants, yielding a response rate of 12.4 percent. However, three surveys were excluded because they lacked sufficient or complete information. Consequently, 53 usable responses were retained for statistical and qualitative analysis, corresponding to a final response rate of 11.8 percent. Although modest, this participation level is consistent with response patterns frequently reported in construction management research, where practitioners tend to show limited involvement in academic survey efforts [65,66]. The web-based nature of the instrument and the absence of tangible incentives may have further discouraged participation [67]. Participant demographic characteristics derived from the completed surveys are summarized in Table 2.

Table 2. Demographic information of the participants.

Category	Demographic Characteristics	Percentage of Participants (n = 53)
Gender	Male	69.8
	Female	30.2
Race	White	60.4
	Non-White	39.6
Company type	General Contractor	54.7
	Sub-Contractor	15.1
	Consulting Firm	17.0
	Other	13.2
Company size	1–249	35.8
	250–499	13.2
	500 or more	51.0
Job role	Project Manager	17.0
	Project Engineer	43.4
	Site Supervisor	15.1
	Other	24.5

4.5. Survey Reliability

Given the limited number of respondents, the research team conducted an assessment to determine whether the sample size was sufficient to support meaningful exploratory conclusions about the construction workforce. As noted by Alotaibi and Gambatese (2024) [65], demonstrating data validity and reliability is essential for ensuring confidence in research outcomes. The study employed a widely accepted sample size calculation method used in construction-related research [12,68], expressed as:

$$n_o = \frac{z^2 \times p \times (1-p)}{e^2}$$

where n_o = sample size; z = z-value for confidence level; p = estimated variability of responses; and e = margin of error.

A confidence level of 95 percent was adopted, corresponding to a z-value of 1.96, in accordance with conventional statistical standards. To account for maximum potential variability in responses, a conservative estimate of p = 0.50 was applied. Previous construction management research has employed broader ranges, typically between 5 and 20 percent [68,69]. Considering the exploratory focus of the present investigation, a margin of error of 15 percent was selected as appropriate. Based on these parameters, the minimum required sample size was determined to be 43 respondents. In addition to evaluating sample adequacy, the internal reliability of the survey instrument was examined using Cronbach's Alpha. This statistic measures the consistency of responses across survey items and ranges from 0 to 1, with values of 0.70 or higher generally regarded as satisfactory [70,71]. For this study, Cronbach's Alpha was calculated to be 0.92 for the mental health questions and 0.90 for management's responsiveness questions, indicating a high level of internal consistency among the survey measures.

5. Results and Analysis

5.1. Availability of Stress Management Program

The availability of structured stress management programs plays a vital role in promoting employee well-being and strengthening organizational resilience [13]. In this study, survey participants were asked whether their employers offered workplace stress management programs and whether they had access to them. Most respondents (58.5%) reported that their organizations provided such programs, while 18.9% indicated that no such programs were available. However, when asked about accessibility, only 50.9% stated that they could access these programs, whereas 22.6% reported having no access. This finding suggests that, despite the presence of company-wide stress management initiatives, a substantial proportion of employees are unable to benefit from them. Additionally, 22.6% of participants were uncertain about the availability of these programs, indicating limited awareness of organizational efforts to manage workplace stress. This uncertainty further highlights potential communication gaps between management and employees. Figure 4 illustrates the availability and accessibility of stress management programs within participating organizations.

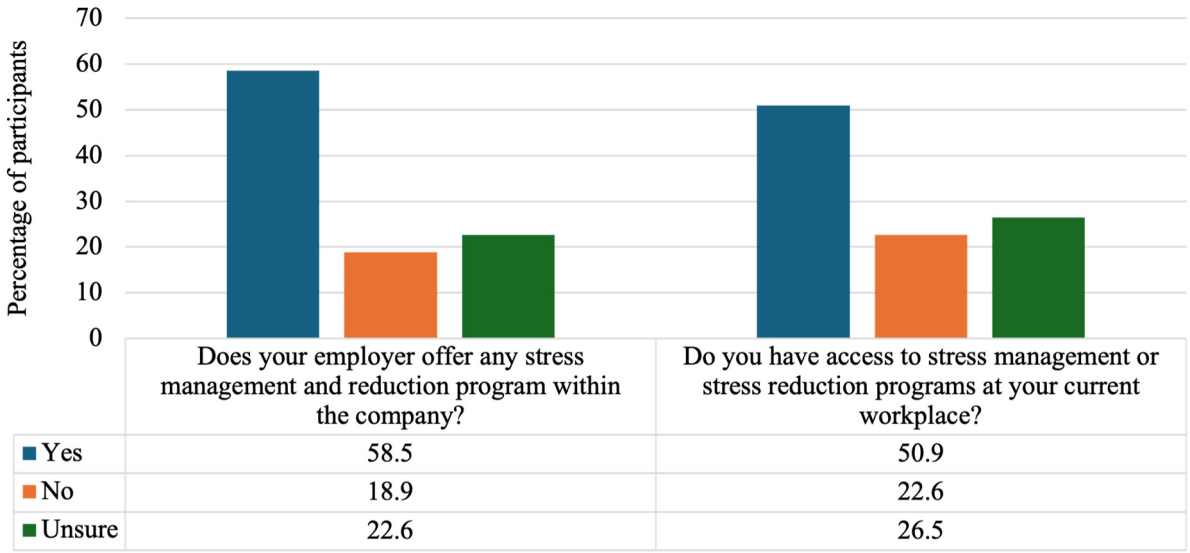


Figure 4. Availability and accessibility of stress management programs.

5.2. Participants' Overall Mental Health and Work Stress Level

To assess participants' psychological well-being, the survey included measures of self-reported overall mental health and perceived work-related stress. Responses were recorded using a five-point Likert scale to support quantitative analysis. Mental health was rated from 1 (Poor) to 5 (Excellent), while work stress ranged from 1 (Always Stressful) to 5 (Never Stressful). The results indicate notable variations in mental health perceptions across demographic groups. Male respondents reported a more positive assessment of their overall mental health (Mean = 3.1) than female respondents (Mean = 2.8). Similarly, when disaggregated by race, white participants reported higher average mental health scores (Mean = 3.7) compared to non-white participants (Mean = 3.1). Job role also appeared to influence mental health outcomes. Project engineers reported the highest average mental health rating (Mean = 3.3), followed by project managers (Mean = 3.2) and site supervisors (Mean = 2.9). These differences suggest that variations in job responsibilities, decision-making authority, and work environments may shape employees' psychological experiences. Consistent with prior research highlighting the high-stress nature of the construction industry, participants generally reported moderate levels of workplace stress. Female respondents indicated higher stress levels (Mean = 2.9) than their male counterparts (Mean = 3.8), potentially reflecting the cumulative impact of work-family conflict, gender-based discrimination, and limited organizational support. Racial differences were also evident, with white participants reporting slightly lower stress (Mean = 3.6) compared to non-white participants (Mean = 3.3), suggesting possible inequities in working conditions and psychosocial resources.

Differences across job roles further underscore the influence of organizational structure on stress outcomes. Site supervisors reported the highest stress levels (Mean = 3.1). In contrast, project engineers (Mean = 3.5) and project managers (Mean = 3.9) reported relatively lower stress, possibly due to greater access to administrative support, decision-making autonomy, and more predictable work environments. It should be noted that the study does not treat subgroup comparisons by gender, race, job role, or organization type as population-level estimates. Instead, these comparisons are used to identify indicative patterns that can inform future confirmatory research. Moreover, given the exploratory nature of the study and the limited subgroup sizes, the mean differences reported in this study are interpreted descriptively rather than as statistically confirmed group differences. Table 3 summarizes the participants' mental health and work stress levels.

Table 3. Participants' overall mental health and work stress levels.

Demographic Grouping	[a] How Often Do You Find Your Work Stressful?		[b] How Would You Rate Your General Mental Health?	
	Mean	**St. Deviation**	**Mean**	**St. Deviation**
Male	3.8	0.9	3.1	0.9
Female	2.9	1.0	2.8	0.7
White	3.6	0.9	3.7	1.0
Non-White	3.3	1.1	3.1	1.1
Project Manager	3.9	1.5	3.2	0.9
Project Engineer	3.5	1.3	3.3	0.9
Site Supervisor	3.1	0.9	2.9	1.0

[a] Rating scale for work stress level: 5 = Never; 4 = Hardly ever; 3 = Sometimes; 2 = Often; 1 = Always. [b] Rating scale for mental health condition: 5 = Excellent; 4 = Very good; 3 = Good; 2 = Fair; 1 = Poor.

5.3. Correlation Between Overall Mental Health and Work Stress Levels

To explore the potential relationship between participants' perceived overall mental health and their reported work stress levels, Spearman's rank-order correlation analysis was conducted. The Spearman correlation coefficient ranges from −1 to +1, where values closer to −1 indicate a strong inverse relationship, values near +1 denote a strong direct relationship, and values around 0 suggest no meaningful association between variables. The correlation analysis indicates a strong and statistically significant relationship between mental health condition and work stress level ($r = 0.61$, $p = 0.01$). This positive correlation suggests that participants' mental health ratings are closely associated with their perceived levels of work stress. Given the scale used in this study, where higher mental health scores represent better psychological well-being and higher stress scores represent lower perceived stress (i.e., less frequent stress), the positive relationship implies that individuals who report better mental health also tend to experience lower levels of workplace stress. The p-value of 0.01 indicates that this relationship is statistically significant at the 1% level. Therefore, the findings provide strong evidence of a meaningful link between psychological well-being and perceived work stress among construction professionals. Table 4 shows the outcomes of Spearman's correlation analysis.

Table 4. Correlation between mental health conditions and work stress levels.

Items		Work Stress Level
Mental health condition	Correlation coefficient	0.61 *
	p-value	0.01
	n	53

* Correlation is significant at the 0.05 level (2-tailed).

5.4. Management and Supervisors' Awareness Levels to Reduce Work Stress

Participants' perceptions of managerial awareness regarding workplace stress and mental health were examined across professional affiliations, including project managers, project engineers, and site supervisors. Respondents rated the awareness levels of both top management and their immediate supervisors using a four-point Likert scale ranging from 1 (Not aware at all) to 4 (Extremely aware).

To examine whether perceived management awareness differed significantly across job roles, a Kruskal–Wallis test was conducted because the awareness items were measured using ordinal Likert-type scales and the subgroup sizes were limited [72]. The test did not indicate a statistically significant difference across job roles ($p > 0.05$), suggesting that the observed mean differences should be interpreted as descriptive patterns rather than confirmed group-level effects.

As shown in Table 5, moderate levels of awareness were reported across all job categories, with mean scores generally ranging between 2.6 and 3.1. Among project managers, perceptions of top management awareness were relatively high (Mean = 3.1, SD = 0.9), indicating that this group viewed senior leadership as moderately to highly aware of employee well-being concerns. However, their ratings of immediate supervisors were slightly lower (Mean = 2.9, SD = 1.0), suggesting some perceived gaps in awareness at the operational level. Project engineers reported comparable awareness levels for both top management (Mean = 2.9, SD = 1.0) and immediate supervisors (Mean = 3.0, SD = 0.9). This consistency may reflect their intermediary position within organizational hierarchies, which allows them to interact frequently with both senior leaders and frontline supervisors. Site supervisors reported the lowest awareness ratings for both top management (Mean = 2.6, SD = 0.9) and immediate supervisors (Mean = 2.7, SD = 1.1). These lower scores suggest that site supervisors may feel relatively disconnected from organizational mental health initiatives and leadership engagement.

Table 5. Management and supervisor's awareness level.

Professional Affiliation	Awareness Level of Top Management		Awareness Level of Immediate Supervisor	
	Mean	St. Deviation	Mean	St. Deviation
Project Manager	3.1	0.9	2.9	1.0
Project Engineer	2.9	1.0	3.0	0.9
Site Supervisor	2.6	0.9	2.7	1.1

Rating scale: 1 = Not aware at all; 2 = Slightly aware; 3 = Moderately aware; and 4 = Extremely aware.

5.5. Management's Responsiveness to Implement Well-Being Strategies

Participants were asked to evaluate their organizations' responsiveness to six targeted well-being strategies. Responses were recorded using a four-point Likert scale ranging from 1 (Not responsive at all) to 4 (Extremely responsive). Mean ratings were analyzed for the overall sample and across three organizational categories: general contractors, subcontractors, and consulting firms.

Overall, the results indicate moderate organizational responsiveness to most well-being strategies, with mean ratings ranging from 2.5 to 3.1 (Table 6). Among the six target strategies, skill diversity (Mean = 3.1) and pay transparency (Mean = 3.1) received the highest overall ratings, suggesting that organizations have made relatively greater efforts to promote workforce flexibility and openness in compensation practices. In contrast, formal well-being programs received the lowest overall rating (Mean = 2.5), indicating limited institutional commitment to structured mental health and wellness initiatives. General contractors consistently reported higher responsiveness across most strategies compared to other organizational types. In particular, they rated corporate policy statements (Mean = 3.3), competitive salary (Mean = 3.1), and fair recruitment and promotion practices (Mean = 3.1) relatively favorably. However, despite these strengths, general contractors reported only moderate responsiveness to well-being programs (Mean = 2.7), indicating that policy commitments may not always translate into comprehensive support systems. Subcontractors reported comparatively lower ratings for several strategies, particularly competitive salary (Mean = 2.7) and well-being programs (Mean = 2.2). These lower scores may reflect the financial constraints and project-based nature of subcontracting firms, which can limit their ability to invest in long-term employee development and wellness initiatives. Notably, subcontractors reported relatively high responsiveness to corporate policy statements (Mean = 3.3) and pay transparency (Mean = 3.2), suggesting that while formal commitments may exist, practical implementation of support mechanisms remains limited. Consulting firms demonstrated moderate responsiveness across most categories, with mean ratings ranging from 2.3 to 3.0. Higher ratings were observed

for skill diversity (Mean = 3.0), corporate policy statements (Mean = 3.0), and pay transparency (Mean = 3.0), reflecting the professional and knowledge-based orientation of these organizations. However, lower ratings for fair recruitment and promotion (Mean = 2.3) and competitive salary (Mean = 2.6) suggest potential concerns related to career progression and compensation structures within consulting environments.

Table 6. Mean ratings of management's response to implement well-being strategies.

Well-Being Strategies	Mean Ratings			
	Overall	General Contractor	Sub-Contractor	Consulting Firm
Skill diversity	3.1	3.2	2.8	3.0
Competitive salary	2.9	3.1	2.7	2.6
Corporate policy statement	3.0	3.3	3.3	3.0
Well-being program	2.5	2.7	2.2	2.4
Fair recruitment and promotion	2.6	3.1	2.8	2.3
Pay transparency	3.1	2.8	3.2	3.0

Scale: 1 = Not responsive at all; 2 = Somewhat responsive; 3 = Moderately responsive; 4 = Extremely responsive.

5.6. Emerging Well-Being Intervention Strategies

To strengthen the qualitative component of the mixed-methods design, open-ended survey responses were analyzed using an NLP-assisted thematic process. First, responses were screened for relevance to workplace mental health and well-being. Then, text preprocessing was conducted through tokenization, lemmatization, and removal of irrelevant terms. A predefined dictionary-based NLP approach was used to identify recurring well-being themes, followed by manual review by the research team to confirm contextual meaning and eliminate themes outside the study scope. This process helped reduce purely subjective interpretation while ensuring that the final themes remained grounded in participants' responses.

The US Surgeon General's framework identifies worker voice and equity as central practices for promoting workers' mental well-being [11]. In the present study, researchers initially identified 12 stressor management themes related to these essentials using natural language processing (NLP), as discussed earlier. However, four themes were excluded due to objectivity concerns and falling outside the study's scope, resulting in 8 valid factors for inclusion. Among all identified factors, mentoring and team building, programs and resources, gratitude and recognition, and open feedback systems were identified as relatively new and important stressors' management factors. The researchers conceptualized strategic management practices targeting root stressors of workers' mental health. The suggested strategic management practices were aligned with ISO 45003 psychosocial risk guidelines [73] and OSHA's (Occupational Safety and Health Administration) evolving recommendations on workplace mental health [74]. Proposed practices include biannual anti-harassment workshops and confidential digital reporting systems to reduce fear-driven stress. The researchers recommended mentoring initiatives such as cross-functional mentorship and daily mental health toolbox talks. Notably, anonymized success stories shared during safety meetings were suggested to normalize help-seeking behaviors. Employee-led audits of promotion criteria are suggested to close equity gaps for minority groups, aligning with Yoder's (1991) critique of superficial inclusion [75]. Recognition tied to measurable key performance indicators (KPIs) (e.g., safety milestones) was proposed in mental health management on jobsites.

It should be noted that the intervention strategies identified from participant responses represent emerging themes rather than tested intervention outcomes. Therefore, the management practices presented in this study should be interpreted as literature-informed and guideline-aligned recommendations, not as causal effects established by the survey data. These recommendations are intended to translate the study findings into practical

directions for future implementation and evaluation. Table 7 presents the identified emerging well-being intervention strategies and proposed management practices for the mental health and well-being of the construction workforce.

Table 7. Well-being intervention strategies with respect to essential mental well-being.

Mental Well-Being Essentials	Emerging Well-Being Intervention Found in Present Study	Potential Stressors Addressed	Proposed Management Practices
Protection from harm	1. Psychosocial safety 2. Regulations and policies	Harassment; Bullying; Threat	• Implement biannual workshops on identifying and reporting workplace stressors such as harassment and bullying. • Conduct quarterly audits (alongside physical safety inspections) to assess threats of violence or intimidation. • Use validated stressor assessment tools (e.g., Copenhagen Psychosocial Questionnaire) and implement employee assistance programs (EAPs). • Deploy a confidential app for real-time reporting of harassment, bullying, or threats, with guaranteed follow-up within 48 h.
Connection and community	3. Mentoring and team-building 4. Programs and resources	Isolation; Prejudgment	• Dedicate 5 min of daily toolbox talks to discuss psychosocial stressors (e.g., isolation and prejudgment) among the team. • Share anonymized peer-support success stories to reduce fear of judgment and strengthen team cohesion. • Pair new hires with experienced mentors for weekly check-ins; use cross-functional matches (site-to-office) to reduce isolation and biases. • Provide 24/7 access to teletherapy and peer support via a company-sponsored digital app.
Mattering at workplace	5. Equal opportunities 6. Gratitude and recognition	Prejudgment; Tokenism	• Form diverse employee-led committees to audit policies (e.g., promotion criteria) and eliminate biases or inequities in advancement opportunities. • Use a digital platform to track and visibly reward employee contributions (e.g., a company-wide "Kudos" system). • Train managers and supervisors to recognize and counteract prejudgments and stereotypes within the company. • Ensure recognition and rewards align with objective key performance indicators (KPIs) rather than subjective assessment to avoid tokenism.
Opportunity for growth	7. Continuous learning 8. Open feedback systems	Tokenism; Isolation	• Establish clear career advancement paths with training certifications (e.g., OSHA mental health certification) for all employees. • Rotate employees across different roles or sites (e.g., have site crew shadow project managers) to break down silos and reduce isolation. • Implement an anonymous upward feedback system for employees to critique workplace culture and management accountability. • Publish aggregated feedback results quarterly to promote transparency.

Mental well-being essentials adapted from the US Surgeon General's Framework [11].

6. Discussion

This exploratory study examined various construction professionals' perceptions of mental health, workplace stress, managerial awareness, and organizational responsiveness to well-being strategies. Rather than treating mental health as only an individual-level concern, the findings position worker well-being as an organizational issue shaped by leadership awareness, supervisory engagement, and the practical implementation of support systems. In this regard, the results extend prior research documenting the construction sector's high psychosocial risk profile and limited systemic support for mental health [4,12,19,20] by showing how these challenges are reflected in leadership recognition and organizational response.

Taken together, the demographic and occupational patterns suggest that psychosocial strain is not evenly distributed across the construction workforce. The results indicate that construction professionals experience moderate levels of psychosocial strain, with notable disparities across gender, race, and job roles. Female and non-white participants consistently reported lower mental health scores and higher perceived stress than their male and white counterparts. These findings reinforce existing evidence that women and minority workers face additional psychosocial burdens related to discrimination, marginalization, and limited access to support systems [31,32]. The persistence of these disparities suggests that organizational well-being initiatives may not be sufficiently inclusive or sensitive to the experiences of underrepresented groups. Job-role differences further illustrate the structural dimensions of stress in construction. Site supervisors reported the highest stress and lowest mental health ratings, reflecting their exposure to intense production pressures, safety responsibilities, and workforce management challenges. This finding supports earlier studies highlighting field-level roles as particularly vulnerable to burnout and emotional exhaustion [20,25].

The strong positive correlation between mental health and perceived work stress confirms the interdependent relationship between psychosocial well-being and occupational demands. Participants who reported lower stress also reported better mental health, suggesting that workplace conditions play a central role in shaping individual outcomes. This finding is consistent with the job demands-resources framework, which emphasizes the balance between work pressures and available support from management as a determinant of well-being [36,37]. From a practical standpoint, this relationship implies that mental health interventions cannot be effective if organizational stressors remain unaddressed. Instead, organizations must adopt integrated approaches that simultaneously reduce harmful job demands and strengthen institutional resources.

Although more than half of respondents indicated that their organizations offer stress management programs, only about half reported having access to these initiatives. Furthermore, more than one-fifth of participants were uncertain about program availability. This disconnect suggests that many well-being efforts remain symbolic rather than functional, supporting earlier critiques that organizational policies often fail to translate into meaningful practice [4,52]. Limited accessibility and awareness may stem from inadequate communication, inconsistent implementation across projects, and weak supervisory engagement. Employees most in need of support, particularly frontline supervisors and field workers, may be least likely to benefit from available resources.

Perceptions of managerial awareness were generally moderate, with site supervisors reporting the lowest levels of perceived engagement from both senior management and immediate supervisors. This pattern highlights a critical weakness in leadership-driven mental health governance. Supervisors serve as the primary interface between workers and organizational systems, and insufficient awareness at this level may limit early identification of distress and discourage help-seeking behavior. The relatively higher

awareness reported by project managers and engineers may reflect their closer proximity to corporate leadership and policy development processes. This finding echoes prior research emphasizing the pivotal role of supervisory relationships in shaping employee well-being [45,46]. The variability in awareness ratings further suggests that leadership practices differ substantially across organizations and projects. Such inconsistency undermines the development of a coherent psychosocial safety culture and limits the effectiveness of organization-wide interventions.

The evaluation of management responsiveness revealed moderate commitment to most well-being strategies, with stronger performance in administrative areas such as pay transparency, policy statements, and skill diversity. In contrast, formal well-being programs received the lowest ratings across all organizational types. This imbalance indicates that companies tend to prioritize visible, compliance-oriented measures over proactive psychological support systems. General contractors demonstrated relatively stronger responsiveness, likely reflecting greater financial and administrative capacity. However, even within this group, investment in structured well-being programs remained limited. Subcontractors reported the weakest performance, particularly in compensation and wellness initiatives, highlighting the constraints imposed by competitive bidding, thin profit margins, and project-based employment. Consulting firms showed moderate engagement but expressed concerns related to career progression and compensation. These findings suggest that organizational structure and contractual arrangements significantly influence the feasibility of well-being initiatives.

Therefore, the central contribution of the findings is not only the identification of stress patterns but also the demonstration of how organizational awareness, access, and responsiveness interact to shape mental health support in construction. Practices such as mentoring programs, confidential reporting systems, employee-led audits, and structured recognition mechanisms directly address root stressors identified in the literature, including isolation, tokenism, and discrimination. Importantly, these strategies move beyond individual-level interventions and embed mental health considerations within core management processes. This integrated approach responds to longstanding critiques that wellness initiatives often fail because they are disconnected from organizational decision-making.

While the proposed management practices offer practical directions for improving workplace well-being, their implementation may vary depending on organizational size, project structure, and available resources. Larger organizations may be better positioned to adopt structured programs such as mentoring systems, formal reporting mechanisms, or dedicated wellness initiatives due to greater administrative and financial capacity. In contrast, smaller contractors or resource-constrained firms may require lower-cost, scalable approaches, such as supervisory communication training, peer support practices, or incremental policy integration within existing safety programs. Therefore, the practical application of these recommendations should be adapted to the organizational context rather than treated as universally uniform solutions.

Overall, the findings indicate that the initial framework provides a useful basis for interpreting how organizational awareness is translated into practical response. The empirical results show that while some well-being strategies are moderately supported, gaps remain in program access, supervisor-level action, and the consistency of implementation across organizations. These gaps also explain the relevance of the emerging strategies identified from participant responses, which extend the framework toward more practical and worker-centered interventions. Therefore, the study contributes by connecting theoretical strategy positioning, empirical evidence, and practice-oriented interventions into a consolidated view of how construction organizations can strengthen mental health and well-being support. Figure 5 presents the consolidated summary linking the theoret-

ical framework, empirical findings, and emerging interventions for mental health in the construction industry.

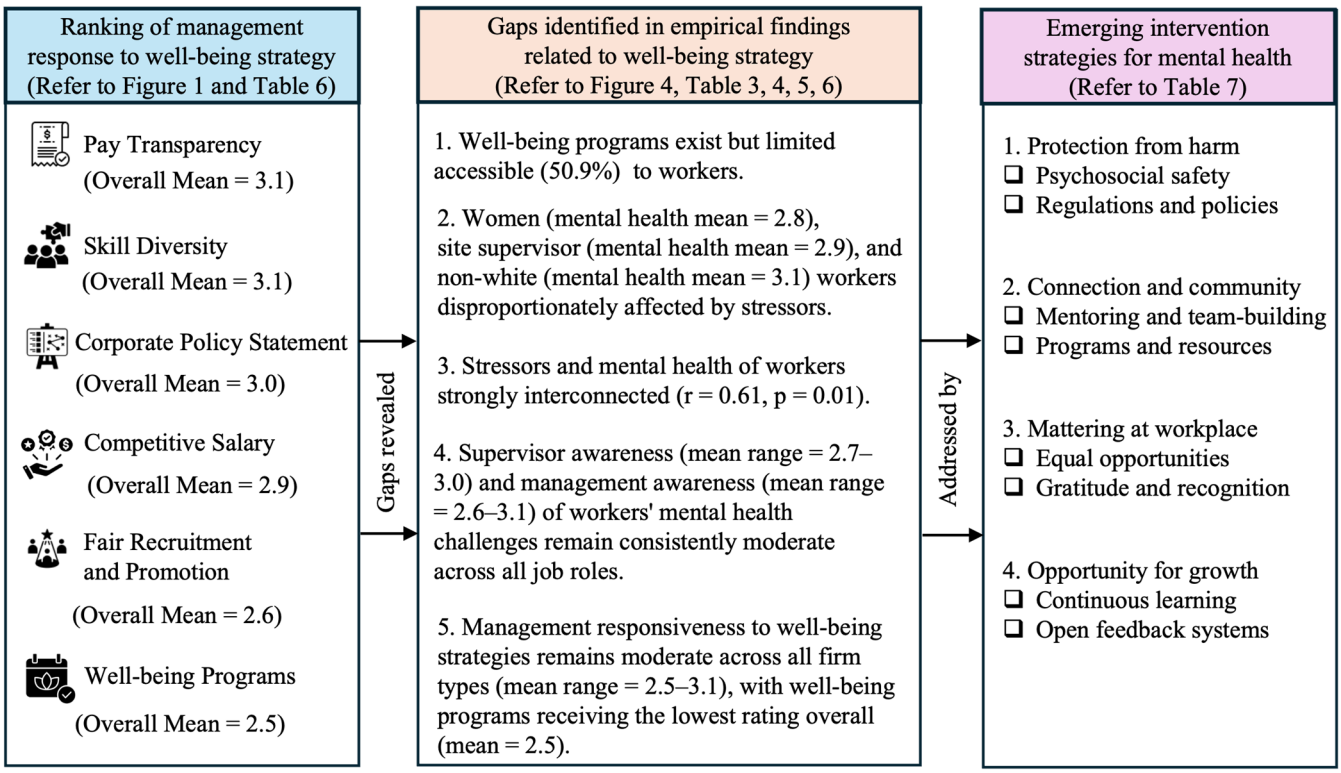


Figure 5. Consolidated summary linking theoretical framework, empirical findings, and emerging intervention strategies for mental health in the construction workplace.

7. Conclusions

This exploratory study advances understanding of how leadership engagement influences the mental health of US construction professionals by examining managerial awareness and responsiveness to targeted well-being strategies across organization types and job roles. Using a mixed-methods survey, the research shifts the lens from worker exposure to psychosocial risks toward the managerial decisions and organizational systems that can mitigate those risks. In addition, the findings have meaningful implications for industry practice by demonstrating that leadership engagement is central to reducing workplace stress, promoting equity, and improving mental well-being across diverse construction roles and organizational types.

The proposed interventions, ranging from confidential reporting systems and structured mentoring to equity audits, transparent pay structures, and daily psychosocial toolbox talks, provide practical, scalable strategies that firms can implement within existing safety and HR infrastructures. These practices have the potential to reduce job-and-discrimination-related stressors, enhance retention of underrepresented groups, strengthen organizational cultures, and ultimately improve safety, productivity, and workforce stability. By aligning with emerging national and international standards, the study supports broader industry movement toward integrated psychosocial risk management and fosters a more inclusive, healthier, and more sustainable construction workforce.

8. Limitations and Future Direction

While this study provides important insights into management's responsiveness to mental health and well-being in the construction industry, several limitations should be

acknowledged. One of the primary constraints is the relatively small sample size. Despite conducting multiple rounds of survey distribution and outreach to various construction organizations, participant engagement remained limited. This outcome may be attributed to common barriers in the industry, such as survey fatigue and discomfort with discussing sensitive topics like mental health, which have been historically under-addressed in construction settings. The modest response rate may also introduce non-response and self-selection bias, as participants with greater awareness of or interest in workplace mental health may have been more likely to complete the survey. In addition, the intervention strategies discussed in this study should be interpreted as practice-oriented recommendations rather than tested intervention effects. Because the study used a cross-sectional survey design, the findings do not establish causal relationships between specific well-being practices and improved mental health outcomes. Therefore, strategies such as mentoring, anonymous reporting systems, psychosocial toolbox talks, and structured feedback mechanisms are presented as literature-informed and participant-informed directions for future implementation and evaluation.

Future research should aim to include a larger and more demographically diverse participant pool from the construction workforce to professionals to enhance the generalizability of findings. Moreover, longitudinal studies are recommended to assess the long-term effects of well-being interventions on mental health outcomes, workforce productivity, and employee retention. Another limitation lies in the exclusive use of an online survey format and the lack of incentives for respondents. These factors may have further contributed to the low participation rate and the limited depth of responses. To strengthen future studies, researchers should consider combining online surveys with in-person interviews or focus groups and offering participation incentives such as gift cards, discount vouchers, or modest financial compensation. These enhancements may increase engagement, improve data quality, and provide richer insights into the complex dynamics of workplace well-being in the construction industry.

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