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Psychosocial Determinants of Risk Perception in Construction Workers: A Cultural and Ethical Assessment

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ABSTRACT

The construction industry is a high-risk workplace due to inherent hazards and variable working conditions. How workers perceive these risks is a multidimensional process shaped by technical safety measures as well as psychosocial, cultural, and ethical factors. This study examines the fundamental psychosocial dynamics that determine construction workers' risk perception and takes a comprehensive approach to the impact of cultural norms, societal values, organizational relationships, and ethical attitudes on safety behavior.

The findings demonstrate that risk perception is strongly determined by the cultural structure and social environment within which workers operate, beyond the level of individual awareness. "Fatalism," "norms of masculinity," the "master-apprentice hierarchy," economic concerns, and production pressures stand out as the primary cultural factors that increase risk-taking. In addition, lack of communication, insecure leadership, low ethical standards, psychological burnout, and a weak sense of belonging are critical psychosocial factors that negatively impact compliance with safety regulations.

The study also reveals that ethical values play a central role in strengthening risk perception. Respect for workers, fair management, and embracing safety measures as an ethical responsibility increase the capacity to develop safe behavior. Consequently, the need for holistic strategies that go beyond technical measures and include cultural and psychosocial dimensions for sustainable occupational safety is emphasized.

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Introduction

The construction industry is one of the oldest production areas in human history, yet despite technological advances, mechanization, and advanced safety tools, it remains one of the highest-risk sectors. As one of the sectors with the highest rate of occupational accidents worldwide, construction poses multifaceted challenges to occupational safety due to both the physical conditions of the work environment and the temporary, dynamic, and often unpredictable nature of work processes. These challenges are not solely attributable to technical or equipment deficiencies; they also encompass psychosocial, cultural, and ethical dimensions that profoundly influence workers' perceptions of risk, their behavioral responses to these risks, and their propensity to comply with safety regulations.

Traditional approaches tend to explain occupational safety problems largely in terms of technical criteria such as structural risks, engineering deficiencies, the use of personal protective equipment, and compliance with organizational procedures. However, recent research has shown that the risk perceptions of workers exposed to similar hazards in the same workplace can differ significantly, and that these differences are largely related not to personal characteristics but to cultural codes, the social environment, the quality of communication in the workplace, leadership attitudes, and the ethical climate. This necessitates viewing risk perception not as a solely rational evaluation process, but rather as a social experience shaped by a wide range of psychosocial factors [1-5].

Understanding the psychosocial nature of risk perception is crucial, especially in the construction industry. Working conditions in this sector are rife with processes that require intense attention, both physical and cognitive, including the risk of falling from heights, the use of heavy equipment, temporary platforms, complex workflows, and constantly changing construction site layouts. In such environments, a worker's ability to recognize risky situations often depends more on how they interpret the hazard in their minds than on its technical nature. For example, some workers view the use of safety equipment as a necessary precaution, while others may perceive it as an "unnecessary burden" or "an obstacle that slows down work." These perceptual differences can directly lead to unsafe behaviors and, consequently, increased workplace accident rates.

Cultural factors play a critical role in this. Many construction workers work within a cultural context in which the societal values they were raised with are reflected in their workplace behavior. For

example, in societies with strong fatalistic attitudes, a dangerous situation is often considered "inevitable," and individuals perceive risk prevention as beyond their personal responsibility. Similarly, in cultural structures dominated by "masculine norms," courage, defiance, and approaching danger can be interpreted as indicators of "mastery" or "experience." Such cultural stereotypes hinder the internalization of safety practices and systematically weaken risk perception.

Another cultural element that influences construction workers' behavior is the occupational socialization process, shaped by the master-apprentice relationship. This hierarchical structure can often overshadow the effectiveness of safety training; workers often accept their masters' behavior as the "correct method." If the master sees safety precautions as unnecessary, the apprentice adopts the same approach, and the perception of risk can be passed down through generations. Therefore, in addition to technical interventions in occupational safety, it becomes essential to develop strategies to transform cultural norms.

Psychosocial factors constitute the second important dimension that shapes risk perception alongside cultural dynamics. Factors such as the quality of communication within the organization, leadership styles, whether employees are valued, perceptions of justice, workload, stress levels, psychological burnout, and a sense of belonging are important indicators that directly impact workers' susceptibility to risks. For example, while managers' commitment to safety and exemplary behavior can influence workers' adoption of safety rules, authoritarian and punitive leadership styles can lead employees to conceal risky behaviors. Similarly, environments with weak organizational justice reduce workers' motivation to comply with rules and negatively impact risk perception [6-12].

Ethical factors also play a central role in shaping risk perception. Workplace safety is not only a legal obligation; it is also a concrete expression of respect for employees' right to life. In work environments where ethics are weak, workers lose motivation to comply with safety measures when they feel they are not valued, and the safety culture becomes unsustainable. However, in workplaces with a strong ethical climate, safety is not a "procedure" but rather a natural and integral part of the job. In this context, ethics emerges as a force that positively transforms risk perception.

This study examines construction workers' risk perception not as a technical problem, but as a multidimensional social process interwoven with cultural, psychological, and ethical dynamics. The aim is to provide a comprehensive analysis of how these elements that shape risk perception interact, how they alter safety behaviors, and where occupational safety policies need to be rethought. The study's unique value lies in highlighting the often overlooked role of cultural and psychosocial dimensions in risk perception in the construction industry.

In this context, the article aims to both contribute to the academic literature and generate practical implications. When occupational safety is viewed solely as a process based on technical regulations and control mechanisms, it is impossible to establish a sustainable safety culture, as behavioral and cultural factors are neglected. However, strengthening workers' risk perception is an essential step for developing safe work behaviors, and this step requires a multidisciplinary approach.

Therefore, the study adopts a holistic approach, at the intersection of disciplines such as engineering, psychology, sociology, anthropology, and ethics, in explaining risk perception in the construction industry. Thus, it emphasizes that safety is not merely a physical phenomenon but also a matter of perception, behavior, and culture [13-20].

Methodology

This study adopted a comprehensive, interdisciplinary methodological approach to explore the multidimensional nature of the psychosocial, cultural, and ethical determinants shaping construction workers' risk perception. Given the dynamism of working conditions in the construction industry, the diversity of hazards, and the intensity of cultural interactions, it is clear that risk perception cannot be explained solely by individual characteristics. Therefore, the study employed a mixed-methods research design, combining quantitative datasets that provide objective measurements with qualitative data that offer insights into workers' experiences, beliefs, behaviors, and perceptions. This method provides both depth and breadth, aligns with the research objective, and offers the opportunity to assess the interplay among the psychosocial, cultural, and ethical components of risk perception within a holistic framework.

The research design, universe and sample characteristics, tools used in the data collection process, implementation steps, ethical principles and analysis techniques are discussed in detail in the following subheadings.

Research Design

The study's methodological framework is based on a sequential explanatory mixed-method design. This design involves two main phases. In the first phase, large-scale quantitative data were collected to determine construction workers' risk perception levels, perceptions of safety culture, psychosocial stressors, and ethical climate. The relationships between variables were statistically tested using the scales used in this process, revealing the extent to which factors influenced risk perception [21-30].

Following the completion of the quantitative phase, the second phase conducted a qualitative data collection process to explain, interpret, and contextualize these findings in greater depth. Semi-structured interviews were conducted to analyze in detail the cultural codes, organizational values, leadership experiences, master-apprentice relationships, and personal meaning-making processes that shape workers' risk perception.

The primary reason for choosing this design is that risk perception in the construction industry is not simply the sum of measurable behavioral indicators; rather, it is a multilayered psychosocial phenomenon shaped by individuals' social environments, professional experiences, societal values, and ethical considerations. Understanding how cultural norms, fatalism, masculine codes, and organizational leadership styles shape risk perception is only possible through the depth qualitative data provides. Thus, the general trends presented by quantitative findings are complemented by the contextual details from qualitative findings, and the real-life implications of risk perception are evaluated holistically.

Research Universe and Sample

The research population comprises all workers employed at medium- and large-scale construction sites across various regions of Antalya, Turkey. As a significant employment sector in the country, the construction sector is characterized by a mix of workers from diverse cultural backgrounds and a high level of temporary workforce mobility. This presents a rich research area

for examining the cultural and psychosocial determinants of risk perception.

Purposive sampling was chosen during the sampling process. This method is based on the fact that different occupational positions (master, journeyman, apprentice, technical personnel), work experience levels, and sociocultural backgrounds in the construction sector can directly influence risk perception. Therefore, the sample was selected to include critical characteristics representative of the study population [31-40].

A total of 348 construction workers participated in the quantitative phase of the study. 87% of the participants were male and 13% were female; this distribution reflects the current sociological structure of the sector. Participants ranged in age from 18 to 58, and their average work experience was calculated as 11.4 years. The large size of the quantitative data set allowed for reliable multivariate analyses.

In the qualitative phase, in-depth semi-structured interviews were conducted with 24 participants. These participants were selected from individuals who represented specific cultural or organizational contexts and could interpret the themes emerging from the quantitative analyses. For example, to examine the difference in perception between workers with high and low risk perception, individuals from both groups were included in the interviews. Furthermore, cultural diversity was ensured by including workers from different ethnic backgrounds and professional positions. This method increased data diversity and strengthened the depth and validity of the research.

Data Collection Tools

The data collection tools used in the study included both scientifically validated scales and qualitative questionnaires specifically developed for the study. These tools were selected to enable the measurement of multidimensional factors that determine risk perception.

Quantitative Data Collection Tools

Risk Perception Scale (RPS): This 5-point Likert-type scale, adapted for the construction industry, measures workers' hazard awareness, risk assessment skills, safe behavior habits, and attitudes toward personal protective equipment. Scale items were adapted to Turkish and Macedonian to ensure linguistic equivalence and validated through back translation. The scale's Cronbach's alpha was .89, indicating high internal consistency.

Psychosocial Work Environment Scale: Based on modules developed by EU-OSHA, this scale assesses workload levels, stressors, communication quality within the organization, leadership style, perceptions of organizational justice, and workplace belonging. The sub-dimensions within the scale provide a structural framework for analyzing the relationship between risk perception and psychosocial factors.

Ethical Climate Scale (ECS): This 26-item scale measures ethical norms in the work environment, the fairness of decision-making processes, management's attitudes toward employees, and the value placed on workers. Given that ethical climate plays a decisive role in risk perception, this scale was positioned at the center of the study.

Cultural Norms and Beliefs Inventory: This inventory consists of original items developed to assess the cultural determinants most frequently emphasized in the literature (fatalism, masculine norms, prioritizing experience over security, and the master-apprentice hierarchy). The items are intended to measure the extent to which participants' cultural values are reflected in their work behavior [41-25].

Qualitative Data Collection Tool: Semi-Structured Interview Form

The semi-structured interview form used in the qualitative data collection process encompassed three main themes:

1. The impact of psychosocial and cultural factors on risk perception:
   How workers perceive risks in their daily work routines, the social relationships and cultural values that shape this perception, were examined in detail.
2. The impact of ethical climate on safety behaviors: Management attitudes, perception of justice, the value placed on workers, and the ethical aspects of safety practices were addressed.
3. The role of master-apprentice relationships on risk perception: How masters' behaviors are modeled and how safety practices are transmitted through professional socialization were examined.
4. Interviews were conducted face-to-face in a suitable, calm, and safe environment at the construction site; each interview lasted 35–60 minutes. Audio recordings were obtained with the participants' permission and then transcribed for descriptive and thematic analysis.

Data Collection Process

Data were collected in four stages between March and August 2024:

Site visits and preliminary observations: Researchers inspected the worksite and collected qualitative data on physical conditions, workflows, use of safety equipment, communication styles, and interactions between workers. Quantitative data collection: Surveys were completed voluntarily under the researchers' guidance at times that did not disrupt the workload.

Preliminary analysis and qualitative sampling: Based on the quantitative results, participants were identified who were suitable for a deeper understanding of specific themes.

Conducting qualitative interviews: Interviews were conducted within the framework of confidentiality principles; cultural values, perceptions, and experiences of the workers were analyzed in the light of their own expressions.

Data Analysis

Both quantitative and qualitative methods were used in the research analysis.

Quantitative Analysis

Quantitative analyses, conducted using SPSS 26.0 software, consisted of the following steps:

Descriptive statistics Cronbach's alpha reliability analysis Exploratory and confirmatory factor analysis Pearson correlation analyses Multiple regression analysis Structural equation modeling These analyses were conducted to scientifically test how risk perception is associated with cultural, psychosocial, and ethical factors.

Qualitative Analyses

Thematic analysis was used to analyze the qualitative data:

1. Analysis of audio recordings
2. Open coding
3. Categorization of codes

4. Creation of main themes
5. Interpretation by integrating with quantitative findings
   This method made the socio-cultural context behind the numerical findings visible.

Findings and Discussion

This research, using a mixed-methods approach, examined the psychosocial, cultural, and ethical determinants that shape construction workers' risk perception, clearly demonstrating its multidimensional nature. When the study's quantitative findings are considered alongside the qualitative analyses, it becomes clear that risk perception is a social process shaped by individual awareness, strong cultural norms, organizational dynamics, and ethical values.

Quantitative findings indicated that construction workers' risk perception was moderate (mean 3.12). High psychosocial stress (3.48) and low perception of safety culture (2.89) indicate an environment that may weaken workers' cognitive sensitivity to hazards. Scores related to cultural norms fatalism (3.67), masculinity (3.58), and adherence to the master-apprentice hierarchy (3.82) revealed that traditional values still dominate the work environment. This result confirms the close link between risk perception and sociocultural background.

Correlation analyses showed that fatalism was the factor that most weakened risk perception ($r = –0.62$). Fatalist employees viewed danger as inevitable and placed less emphasis on safety behaviors. Masculine norms were found to be strongly inversely correlated with safety behavior ($r = –0.47$); risky behaviors, perceived as a sign of masculinity, weakened the use of safety equipment. The negative correlation between the master-apprentice hierarchy and equipment use ($r = –0.39$) underscores the importance of role-model influence in the workplace. The positive correlation between ethical climate and risk perception ($r = 0.58$) revealed that ethical values are a key factor in strengthening safety. The positive correlation between leadership quality ($r = .44$) and the negative correlation between stress ($r = –0.41$) suggest that risk perception is sensitive to organizational and psychosocial conditions [53-60].

Regression analyses confirmed that fatalism, ethical climate, and leadership were the variables most strongly influencing risk perception; the model accounted for 61% of the total variance. SEM modeling showed that the influence of cultural norms on risk perception is often indirect for example, masculinity norms influence risk perception through safety behavior, and hierarchy influences risk perception through safety communication.

Qualitative findings revealed five main themes that support the quantitative results. First, the perception of danger as a "natural part of the job" confirms the impact of fatalism. Second, a culture of masculinity encourages risk-taking, seen as a display of courage, especially among younger workers. Third, the mentor-apprentice relationship is decisive in the transmission of safety behaviors, and the mentor's risky behavior can become the workplace norm. The fourth theme demonstrates how organizational and psychosocial pressures poor communication, high workload, oppressive leadership, and burnoutundermine risk perception. The fifth theme demonstrates that an ethical climate strengthens safety behavior; respect for workers and fair management increase motivation to engage in safe behavior.

A joint assessment of quantitative and qualitative data points to three key conclusions:

1. Cultural norms are the strongest determinants of risk perception and have direct and indirect effects on safety behaviors.
2. Ethical climate and leadership are critical protective factors that strengthen risk perception; employees in workplaces with strong ethical values perceive danger more accurately and comply with safety rules more frequently.
3. Psychosocial pressures, particularly stress and lack of communication, weaken safety behaviors and reduce risk perception.

Discussion

This research examines the psychosocial, cultural, and ethical determinants that shape construction workers' risk perception from a multidimensional perspective. The results from quantitative and qualitative data clearly demonstrate that risk perception is not a one-dimensional individual process but a complex structure interwoven with social relations, cultural norms, and organizational values. This section discusses the research's key findings in comparison with the literature and interprets the implications of the results for construction safety, safety culture, and employee behavior.

Cultural Foundations of Risk Perception

One of the most significant findings of the study is that cultural norms strongly influence risk perception. Quantitative data showed that fatalism significantly lowers risk perception, while masculine norms and the master-apprentice hierarchy undermine safe behavior. Qualitative findings support these findings, showing that workers perceive danger as the "fate of the profession," view accidents as inevitable, and normalize risky behaviors.

This demonstrates that individual rational assessments do not solely form risk perception; cultural and collective belief systems play a significant role. Previous studies have also emphasized that fatalism, particularly in high-risk jobs, undermines safety behaviors and leads workers to underestimate the danger. This research confirms this finding within the specific cultural context of the construction industry.

The encouragement of risk-taking behavior by masculine norms is a common finding in the literature; however, this study makes a unique contribution by demonstrating that masculine norms are not merely an individual tendency but an internalized part of workplace status and professional identity. The perception of risk-taking, particularly among young and inexperienced workers, as an act of "courage" or a "path to mastery," directly negatively impacts safety performance. This finding is an important indicator of why safety training, limited to the transfer of technical knowledge, is often ineffective.

The decisive influence of master-apprentice relationships is also emphasized in the literature, but often under-analyzed systematically. This study demonstrates that the master's behavior becomes the norm, with apprentices adopting their masters' practices as the "correct method," thereby embedding risky behaviors within the work culture. Therefore, cultural hierarchies emerge as a social mechanism that directly shapes risk perception.

The Effect of Psychosocial Factors on Risk Perception

The study's quantitative findings highlighted psychosocial stress, workload, poor communication quality, and weak leadership as factors that reduce risk perception. Qualitative findings revealed that workers frequently cited intense time pressure, financial worries, burnout, management pressure, and poor communication about safety. These results support studies on "safety climate" and "organizational behavior" in the occupational safety literature.

When stress and workload increase, employees' cognitive attention decreases, weakening their ability to recognize hazards. Furthermore, because risk signals are not conveyed accurately in environments with inadequate communication, employees may misjudge the true level of risk.

Leadership emerged as one of the strongest predictors of risk perception in the study. Workers at construction sites with ethical, safety-focused leaders are more likely to comply with safety rules. In contrast, those with authoritarian, punitive leadership styles exhibit lower risk perception and motivation to engage in safe behavior. This finding aligns with the literature, which demonstrates that management's attitude is one of the most critical components of safety culture [61-69].

The Transformative Effect of Ethical Climate on Risk Perception

One of the most striking findings in the study is the strong and positive relationship between ethical climate and risk perception. Quantitative analyses showed that ethical climate significantly predicted risk perception, and qualitative interviews indicated that a fair, respectful, and safety-sensitive management approach led workers to be more vigilant. This result demonstrates that a work environment grounded in ethical values is a key determinant of safety behaviors. When the ethical climate is strong, workers feel valued, assume greater responsibility toward the organization, and are more likely to comply with safety rules voluntarily. This finding offers a significant contribution to the occupational health and safety literature. While existing studies generally associate risk perception with technical or psychological factors, this research demonstrates that ethical values are a powerful social mechanism that directly transforms risk perception. Perceiving safety practices as an ethical responsibility, rather than a mere procedure, is one of the key factors that increase safe behavioral tendencies.

The Interaction of Cultural, Psychosocial and Ethical Factors

The study's mixed-methods design demonstrated that a single factor does not determine risk perception; rather, risk perception is shaped by the interplay of cultural beliefs, social roles, organizational processes, and ethical values. Structural equation modeling revealed that cultural norms often indirectly influence risk perception through intermediary mechanisms such as organizational communication, leadership, and safety behavior.

For example, while masculine norms directly reduce risk perception, they also negatively affect the use of safety equipment, thereby reinforcing risky behaviors. Similarly, fatalism emerges not only at the individual level but also as a belief system that weakens organizational safety culture. These findings suggest that focusing solely on technical measures or individual training programs is insufficient to improve safety performance in the construction industry. Strengthening risk perception requires a holistic approach encompassing cultural transformation, psychosocial support mechanisms, and ethical leadership [70-79].

Conclusıon and Recommendatıons

This research examined the psychosocial, cultural, and ethical factors that determine construction workers' risk perception from a multidimensional perspective, demonstrating that risk perception is a complex construct not limited to technical knowledge or individual awareness, but is strongly shaped by social, cultural, and organizational factors. A holistic evaluation of the quantitative and qualitative findings from the mixed-method design demonstrates that cultural norms, organizational communication, and ethical leadership must be addressed together as a prerequisite for enhancing safe work behaviors.

Key Results of the Research

1. Cultural Norms are the Strongest Determinants of Risk Perception Fatalism, masculine norms, and the master-apprentice hierarchy are the most prominent factors that weaken risk perception and negatively impact safety behavior, as evidenced by both quantitative and qualitative findings. By portraying danger as inevitable, a fatalistic belief system reduces safety behaviors. Masculinity norms, by making risk-taking a sign of "courage" or "mastery," undermine the use of safety equipment. Because master behavior becomes the norm in master-apprentice relationships, risky attitudes are transmitted to new generations of workers through occupational socialization. This demonstrates that technical training alone, without cultural transformation, will not produce sustainable results.

2. Psychosocial Factors Weaken Risk Perception Stress, high workload, poor communication, low perceptions of organizational justice, and leadership weaknesses significantly reduce risk perception. Intense workloads and time pressures lead to neglect of safe behaviors. In environments with poor safety communication, workers cannot accurately assess the level of hazard. Workers experiencing burnout have a lower risk perception and an increased likelihood of making mistakes. These results demonstrate that psychosocial well-being is a fundamental prerequisite for safety performance.

3. Ethical Climate is the Main Protective Factor that Strengthens Risk Perception One of the most compelling findings of the study is that ethical climate has a direct, transformative impact on risk perception. Fair and transparent management practices ensure that employees internalize safety rules. In environments with strong ethical values, workers feel valued and more clearly understand the importance of the right to safe work. Ethical leadership facilitates the adoption of safe behavior as an organizational value. This finding demonstrates that establishing a safety culture is possible not only through technical regulations but also through a strong ethical foundation.

Recommendations for Applications: Based on the research findings, the following recommendations were developed to strengthen risk perception and reduce occupational accidents in the construction industry:

1. Safety Programs Targeting Cultural Transformation Should be Designed

Safety training should not only contain technical content; it should include behavior-focused modules that address cultural factors such as fatalism, masculine norms, and hierarchical subordination. Specialized safety leadership training should be provided for foremen who are considered role models. Culturally sensitive communication strategies should be implemented, taking into account the perceptional differences among workers from diverse cultural backgrounds.

2. Ethical Leadership and Fair Management Should be Strengthened

Construction site managers should receive training in ethical leadership principles and ensure consistency and transparency in safety practices. A management approach that encourages compliance with safety rules, prohibits discrimination, and prioritizes respect for employees should be adopted. The ethical climate should be strengthened by developing mechanisms for

providing feedback to workers, reporting risks, and submitting complaints.

3. Workplace Practices that Support Psychosocial Well-being Should be Widespread

Plans should be made to reduce excessive workload and time pressure, and to improve break times. Workers working in risky areas should be provided with stress management and psychological resilience training. Signs of burnout in workers should be identified early, and support mechanisms should be established.

4. Interactive and Continuous Security Communication Should be Provided

Regular safety meetings, short toolbox training, and visual safety warnings should be used on construction sites. The communication role of craftsmen should be strengthened, considering the impact of the master-apprentice structure. Positive campaigns encouraging the use of safety equipment should be organized.

5. Academic and Institutional Research Should be Supported

Longitudinal studies should be conducted to examine the impact of cultural norms and ethical climate on safety in the construction industry. Joint projects focused on risk perception should be conducted between universities and the industry. Comprehensive risk assessment models that include psychosocial risks should be implemented in sectoral policies.This study demonstrates that risk perception in the construction industry is not a technical assessment, but a multilayered process shaped by employees' cultural identities, ethical values, and psychosocial experiences. The success of construction safety policies depends on acknowledging this social reality and implementing holistic strategies that address cultural and ethical issues.Sustainable safety depends on understanding human behavior, transforming social norms, and strengthening ethical leadership. In this context, the study makes significant contributions to the literature and practice by emphasizing the need for a new approach to safety centered on risk perception.

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