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Psychosocial Factors Issues in Construction Workers: A Systematic Review and Future Research Directions

Muhammad Fajar Wahyudi Rahman*, Sri Gunani Partiwi, Retno Widyaningrum

Industrial and System Engineering Department, Institut Teknologi Sepuluh Nopember, Surabaya 60111, Indonesia

Corresponding Author Email: 7010212002@mhs.its.ac.id

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ABSTRACT

The systematic literature review several previous studies indicates a growing focus on psychosocial factors issues in construction workers' research in recent years, which is predicted to continue. However, currently, there is no comprehensive framework with clearly defined indicators or dimensions to analyze the role of psychosocial factors in the context of construction workers. This paper aims to provide in-depth insights into and analyze psychosocial factors issues in construction workers, identify about anything research topics that have been handled, and identify opportunities regarding other topics that can be carried out in future research. This paper applies a systematic literature review methodology design. Present a structured overview derived from 32 reputable international journal articles indexed in the Scopus database. The results are based on selected reputable international journal articles are clustered based on the analytical framework containing eight psychosocial factors in construction worker research, namely demand, control, support, stress, condition, satisfaction, description, and conflict. In addition, this paper finds four theoretical frameworks based on previous research, namely JD-R model, JD-C model, P-E fit theory, and TPB model that can be applied. This literature study will contribute to analyzing the influence of psychosocial factors in the context of construction workers in presenting a framework of indicators or dimensions that can be applied. Know the theoretical framework and methodology that has been used. Identify research topics, areas, and additional opportunities to link other variables in future research.

1. INTRODUCTION

The construction sector industry is widely recognized as one of the most high-risk and dynamically complex industries globally [1]. Its distinctiveness arises from the combination of intricate and perilous project site conditions, a constantly changing resource landscape, and extensive physical labor requirements, all of which contribute to the employment of millions of individuals, setting it apart from other sectors [2]. While a substantial body of research has traditionally focused on physical job demands such as manual material handling and awkward postures, there has been relatively less emphasis on exploring the influence of psychosocial factors [3]. Consequently, there is an increasing level of awareness of the importance of examining psychosocial factors among construction workers [4].

Psychosocial factors are aspects of employee structure in an organization as well as in terms of workplace management. Psychosocial factors consist of social and organizational attributes, so they are the cause of psychological and physical effects on individuals [5]. Tong et al. [4] explained that psychosocial factors occur at two levels, namely the organizational level and the individual level. The organizational level includes interpersonal conflict and social support. The individual level includes work stress, role ambiguity, work-family conflict, and autonomy. The psychological factors dimension includes work stress, role ambiguity, and autonomy. Meanwhile, the social factor dimension includes social support, interpersonal conflict, and work-family conflict.

Construction workers, by their job demands, may encounter various psychosocial elements within their work environment [3]. Psychosocial aspects involve the amalgamation of social and psychological components, encompassing persistent and immediate stressors and encompassing social, cultural, or environmental factors that have the ability to impact an individual's health and conduct [6]. In conjunction with the evolution of occupational health psychology, previously it has been observed that psychosocial factors can play a role in influencing the psychological well-being of construction workers, which can improve their safety performance [4].

Numerous construction laborers experience significant stress in adhering to specific project deadlines, and they often encounter periods of unemployment during project gaps [3]. Their responsibilities encompass a wide range of tasks, necessitating their adaptability to a consistently changing and fast-paced work environment [3]. Additionally, they frequently experience fluctuations in team composition when transitioning between projects [3]. Even within larger construction corporations, relocating to different job sites with

varying site management can adversely impact worker morale, especially in instances characterized by poor communication and misunderstandings regarding the overall company policies [3]. This is a problem in terms of quite complex psychosocial factors in the construction sector industry.

Moreover, Pirzadeh et al. [7] attempted to investigate, match, and differentiate the characteristics of psychosocial factors in terms of the quality of mental health-focused work. As a result, it proves that the quality of work from psychosocial factors is proven to have an influence on workers' mental health levels. Recent research discussing psychosocial factors in the construction sector by Indrayana et al. [8]. The results proved that the maturity of the nature and character of the leader, maturity of the project owner's psychosocial factors, the participatory maturity of the project owner, maturity of the level of public communication owned by the project owner, and the maturity of the project owner's safety competence showed high significance in shaping the level of safety performance in construction sector industry projects.

While some research efforts have delved into investigating psychosocial aspects among construction workers [9, 10], it remains challenging to identify pertinent and dependable psychosocial measures [11]. Currently, there is no comprehensive framework with clearly defined indicators or dimensions to analyze the influence of psychosocial factor variables in the context of construction workers. Consequently, there is an ongoing need for the development of a standardized tool capable of consistently assessing psychosocial factors [3]. Therefore, there is a requirement to establish a holistic framework that can organize and present a description of current research on psychosocial factors in construction workers.

This paper offers a comprehensive examination and analysis of psychosocial factors in research concerning construction workers, as published in reputable international journals. Specifically, the paper seeks to respond to the following research inquiries:

RQ1. How can psychosocial factors literature in construction worker research be classified into clusters?

RQ2. How have psychosocial factors issues in construction worker's research developed in recent times?

The primary objective is to be able to carry out a review process of previously existing literature concerning psychosocial factors to ascertain the areas of research that have been explored and to recognize research that has potential for future investigation. This research will enrich the existing literature in the following ways. First, it presents a clear framework of indicators or dimensions to analyze the influence of psychosocial factors variable in the context of construction workers. Second, to find out the theoretical and methodological framework used in studying the problem of psychosocial factors in construction workers. Finally, this work helps researchers investigate what research topics have been researched and where additional new opportunities may arise to link other variables in future research.

The subsequent section outlines our review methodology published in a reputable international journal. It also details the criteria for selecting the databases, time horizon, articles, journals, and their categorization. Additionally, we introduce an analytical conceptual framework for clustering research on psychosocial factors among construction workers, and we show the outcomes of our comprehensive literature review. The conclusion summarizes the primary discoveries and their significance for researchers and explores potential avenues for future research.

2. METHODS

This research article presents a deep and systematic literature review to identify and categorize the existing body of literature concerning psychosocial factors in construction workers' matters. Additionally, it seeks to analyze potential topic for further research in the future. The selection of a rigorous literature review as the chosen methodology is justified with two main reasons. The first, it provides a transparent, systematic and replicable means of investigating, assessing, and translateting the available literature [12]. Secondly, it is a true approach in order to produce knowledge because of synthesizing available studies, which can sometimes be more pertinent and significant than novel research endeavors [13]. The research methodology used refers to research by Hohenstein et al. [14]. This research's literature review approach is based on six process stages and examines problems based on time horizon, database selection journal selection, article selection, article classification, and article analysis. This research method was chosen because it has been proven to be a reliable method that can be carried out in literature review studies that have previously been published in reputable international journals.

2.1 Time horizon for selection of papers

For the objectives of the review and evaluation process, the publication dates span of the reputable journal articles range from 1976 to the conclusion of 2023. Based on this, the review's analysis encompasses a time frame spanning five decades. The year 1976 is the commencing point for the collection of pertinent data because it marks the initiation of notable attention from various influential authors to the subject of psychosocial factors within the construction industry [15]. The conclusion of 2023 is designated as the concluding date to encompass the most recent and reputable international journal publications, given the surge in articles addressing this profoundly significant subject matter.

2.2 Selection of databases

In this investigation, online databases were employed as research instruments to identify relevant publications. The Scopus databases were selected as the primary sources for the literature review due to their consistent standards for articles. Scopus is an indexing database in reputable international journals. This search methodology is well-recognized and has been employed in previous literature reviews [16]. The decision to use Scopus databases was driven by their extensive coverage and precise search capabilities [17]. Scopus is a comprehensive electronic database featuring a vast assortment of over 18,000 scholarly works originating from more than 5,000 international publishers. It encompasses 16,500 peer-reviewed journals, including scientific, technical, medical, and social sciences [18].

2.3 Journal selection

McKinnon [19] explains that, there is an extensively recognized consensus within the academic community regarding different journals' varying degrees of reputation. In

order to ensure the exceptional quality of the literature examined within this study, we opted to concentrate solely on peer-reviewed journal articles, as advocated by David and Han [20]. This approach aligns with the viewpoint expressed by Light and Pillemer [21], who suggest that "Confining a review to published studies can serve as an effective means of quality control. Most peer-reviewed journals uphold rigorous publication standards, typically producing a more refined technical output". Adhering to this guidance, we specifically chose journals listed in the Scopus database that were pertinent to the construction industry and were distinguished by their esteemed reputation. This selection process directed our literature review toward identifying articles that address psychosocial factors about construction workers.

Finally, 25 reputable international journals were selected for the databases search: *Scandinavian Journal of Work Environment and Health; International Journal of Environmental Research and Public Health; Journal of Construction Engineering and Management; Spine; Advances in Dual Diagnosis; Annals of Occupational Hygiene; Applied Ergonomics; Asia Pacific Journal of Public Health; BMC Public Health; Biomed Research International; Building Research and Information; Engineering Construction and Architectural Management; Environmental Health and Preventive Medicine; Human Factors and Ergonomics in Manufacturing; International Archives of Occupational and Environmental Health; International Journal of Construction Supply Chain Management; International Journal of Industrial Ergonomics; International Journal of Injury Control and Safety Promotion; International Journal of Psychology; International Journal of Safety and Security Engineering; Journal of Affective Disorders; Journal of Psychosomatic Research; Scandinavian Journal of Gastroenterology; Sustainability Switzerland; and Theoretical Issues in Ergonomics Science*.

Future academic scholars do not need to feel worried and confused about choosing a reputable international scientific journal that is free from the predatory journal category. A total of 25 reputable international journals indexed by Scopus will be able to become references for writers who take up the theme of psychosocial factors in construction sector workers to publish their best work in journals that have proven quality. This will provide self-satisfaction and legitimize the person's expertise in the work they publish, and it is hoped that it will become a reference for further research.

2.4 Article selection

First, title, abstract, and keywords are determined as filtering criteria for searching articles in reputable international journals in online databases. Utilizing the search criteria (Title-Abs-Key (“Psychosocial Factors”) AND Title-Abs-Key (“Construction Workers”) OR Title-Abs-Key (“Construction Sector”) OR Title-Abs-Key (“Construction Industry”)) on the title/abstract/keywords contained in the journal article in the online database mentioned above and included in the entire text. Then, every document from 1976 to 2023 was taken into account. Based on this, a total of 36 documents were found. The presentation of the article selection process flow can be seen in Figure 1.

Subsequently, the abstracts were perused to be able to carry out the assessment process pertinence of the documents pertaining to psychosocial factors. In an effort to ensure consistent focus and reduce bias, articles identified as inappropriate to this study were removed. Additionally, to prevent double counting of articles in our analysis, any duplicate articles were removed [22]. In the filter menu, we apply the document type option to limit the findings to publications that are classified as articles, not conference papers or reviews. Based on the description of the process that has been carried out, a total of 32 articles can be analyzed which have been selected based on considerations of originality, clearly stated objectives and relevance.

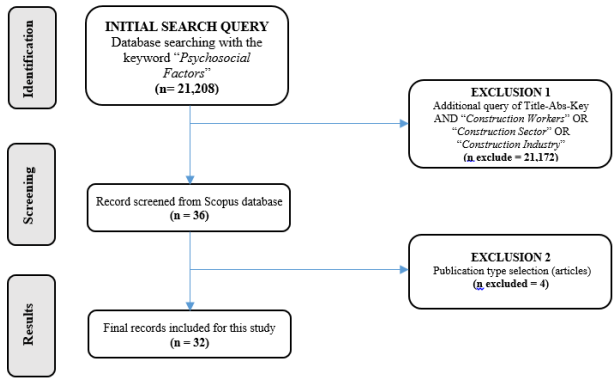

Figure 1. Summary of article selection process

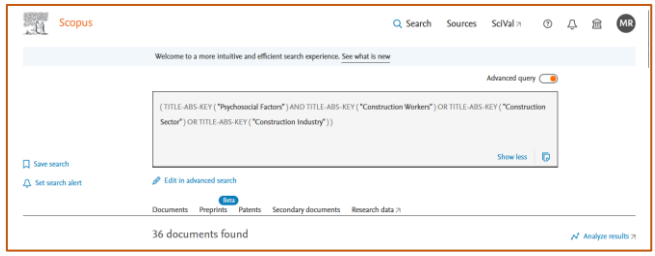

Figure 2. Number of documents in the Scopus database

Based on Figure 2, displays the details of the evidence for the number of documents. Because there are only a small number of research articles that take into account the role of psychosocial factors on construction workers, the records are fewer in number. Nevertheless, given many previous research recommendations, we consider it worthwhile to review this pivotal topic and field.

The inclusion of these articles in the review of the literature was undertaken with the objective of guaranteeing the elevated standard and thoroughness of this manuscript. The subsequent phase involves the formulation of a classification of the article.

2.5 Article classifications

The final sample comprised 32 journal articles, subsequently subjected to in-depth analysis and individual categorization based on the characteristics delineated in the following section. To structure the chosen journal publications, we examined, analyzed, and synthesized diverse research areas. As previously mentioned, we conducted a comprehensive review of the works of various authors who had previously explored issues related to psychosocial factors among construction workers. More specifically, the classification process was guided by the 32 identified results aimed at discerning the principal psychosocial factors and dimensions that influence research about construction workers. These authors collectively delineated numerous categories within the realm of psychosocial factors, encompassing

demands, control, support, stress, conditions, satisfaction, description, and conflict. Thus, the findings of the current review may shape future research directions.

A brief summary of important findings obtained from the analysis of 32 selected journal articles (as retrieved from the Scopus database) in relation to research clusters pertaining to psychosocial factors among construction workers can be seen in Table 1.

Table 1. Key review of selected journal articles

Author	Review
Tong et al. [4]	• Literature review of 13 databases and meta-analysis from 68 articles. • Job demands-resources (JD-R) theory. • Six selected psychosocial factors (work stress, role ambiguity, work-family conflict, autonomy, social support, and interpersonal conflict).
Dogbla et al. [23]	• Quantitative. Chi-squared test, cramer's V, and logistic regression. • Total 2.446 workers at Association de Prévention en Santéau Travail du Cher (APST18), France. • Seven selected psychosocial factors (emotional demands of the job, work requirements, autonomy of organization, socioeconomic fears, support at work (colleagues, employer, supervisor), recognition at work (colleagues, employer, supervisor), and conflict at work).
Indrayana et al. [8]	• Quantitative. Structural equation modeling with AMOS. • A total of 324 contractor personnels from 246 projects in Indonesia • Five indicators psychosocial factors (recognition, coaching, control and supervision, concerns, and regulations).
Liu et al. [24]	• Quantitative. Structural equation modeling with AMOS. • Planned behaviour theory • Total 235 respondents within the Chinese construction industry • Four dimensions psychosocial factors (benefit perception attitude, risk perception attitude, subjective norm, and perceived behavioural control).
Pirzadeh et al. [7]	• Quantitative. Longitudinal random-intercept regression models. • Used 15 waves of data from the HILDA survey with 6.352 responses from 1.768 participants from the national and longitudinal Household, Income, and Labour Dynamics in Australia Survey data set. • Five aspects of psychosocial job quality (job demands and complexity, job control, perceived job security, effort-reward fairness, and job intensity)
Ross et al. [25]	• Quantitative. Univariate logistic regressions with SPSS v27. • Total 1402 apprentices within the Queensland, Australia construction industry. • Psychosocial factors related to suicidal ideation in the past year, exposure to suicidal behaviors, substance use, stress management, workplace bullying, psychological distress, and well-being.
Suriyanon and Sutheerawatthana [9]	• Quantitative. Logistic regression analysis. • Data from 438 construction workers in 8 Bangkok subdivision housing projects. • Job demand-control theory. • Three psychosocial factors (psychological demand, control latitude, and social support).
Maqsoom et al [26]	• Quantitative. Mann–Whitney U test through SPSS. • Data from 131 engineers' construction in Pakistan Engineering Council. • Job demands–resources (JD–R) theory. • Eight questions related to psychosocial stressors (uneven distribution of work, relationships with coworkers, daily task completion, career advancement, well-defined tasks, physically exhausting job, team cooperation, and workplace satisfaction).
Pérez-Alonso et al. [27]	• Quantitative. A descriptive analysis and multiple correspondence analysis. • Total 62 workers of 30 companiesthe greenhouse construction industry in south-eastern Spain. • The mini psychosocial factors method assesses 12 variables (rhythm, mobbing, relationships, health, recognition, autonomy, emotion, support, compensation, control, demands, and mental load).
Sirén et al. [28]	• Quantitative. Competing risk regression model (STATA v14). • Finnish wage earners (n= 1.135.654) full disability retirement due to a shoulder lesion. • Psychosocial work-related factors (high job demands, low job control, and monotonousness of work).
López-García et al. [10]	• Quantitative. MATLAB software. • Sampled 8.892 workers in Spain. • Four psychosocial factors (social support, personal development of the worker, independence at work, and work-related concerns).
Navarro-Abal et al. [29]	• Quantitative. Variance analysis and Pearson's correlation matrix. • Job demand-control theory. • Sampled 302 individuals belonging to Andalusian companies, Spanish. • Study highlights psychosocial factor (work demands, exposure to harmful conditions, work control, and social support).
Moberg et al. [30]	• Quantitative. Logistic regression. • Sampled 137 construction and health care workers in Norwegian. • Psychosocial factors include encouragement and support of colleagues and leaders.

Pidd et al. [31]	• Quantitative. Multiple regression analysis with SPSS 22.0. • Sampled 169 building trade apprentices enrolled at two South Australian Vocational Education and Training organizations. • Psychosocial factors include job stress, workplace bullying, general social support, workplace social support, work engagement, and communication skills.
van der Klauw et al. [32]	• Quantitative. Logistic regression analysis. • Total 5.521 respondents in the construction industry and 23.814 respondents in the health and welfare sector in the Netherlands. • Four psychosocial factors at work were measured: job autonomy, time pressure, workplace violence and harassment by supervisors or colleagues, and workplace violence and harassment by people outside the organization.
Das [33]	• Quantitative. Rapid Entire Body Assessment method with Primer of Biostatistics v5. • Total 148 female brick field workers from 20 main brick fields of Bhadrakali in Hooghly district, India. • Psychosocial factors include work organization, work behavior, and work stress.
Lorente et al. [34]	• Quantitative. Structural equation modeling with AMOS 16. • Sampled 228 construction workers in Spanish small and medium-sized enterprises. • Job demands-resources (JD-R) theory. • Psychosocial factors include personal resources (self-efficacy, mental and emotional competencies) and perception of job resources (job control and supervisor social support).
Van Deurssen et al. [35]	• Quantitative. Univariate analyses and linear regression models with SAS v9.3. • Sampled 116 construction workers (bricklayers, carpenters, concrete drillers, demolishers, and tuck pointers) from the Dutch occupational. • Psychosocial factors like knowledge and beliefs regarding the effectiveness of controls, risk perception, social influence, motivation, and self-efficacy.
Boschman et al. [36]	• Quantitative. Logistic regression with SPSS 19.0. • Sampled 1500 bricklayers and construction supervisors in Dutch. • Job demand-control theory. • Psychosocial work characteristics (job demands, job control, social support, job variety, and future perspective).
Abbe et al. [37]	• Quantitative. Simple step-wise regression and nominal logistic regression. • Sampled 68 participants who worked at an industrial construction company in Louisiana. • The demand-control theory. • Psychosocial factors include job demands, organizational stressors, and environmental stressors.
Sobeih et al. [38]	• Quantitative. A multivariate logistic regression model with SAS. • Sampled 147 construction workers in the Greater Cincinnati area, Ohio, AS. • The 12 psychosocial and physical factors: physical task content; mental task content; physical environment; social; organizational; technological; economic; individual growth; work effort; experienced risk from work tasks and environment; work performance; and dissatisfaction.
Salem et al. [39]	• Quantitative. Multivariate logistic regression model. • Sampled 147 active construction workers in the Greater Cincinnati area of Ohio. • Person-environment (P-E) fit theory. • Psychosocial factors including mental task demands and individual growth (Demand–Energizer Instrument (DEI).
Alavinia et al. [40]	• Quantitative. Multiple linear and logistic regression models with SAS v8.2. • Sampled 19.507 Dutch construction workers. • Psychosocial work characteristics assessed: job demands, job control, supervisor and co-worker support, and satisfaction with work.
Sobeih et al. [3]	• Systematic review. Eight cross-sectional and two cohort studies. • Psychosocial factors include high job stress; low job control; low job satisfaction; high quantitative job demands; low stimulus from work; low social support; high qualitative job demands; and worry distress, and stress reactions not primarily work-related.
Engholm & Holmström [41]	• Quantitative. Logistic regression methods with SPSS v11.0. • Sampled 85.191 male employees in the Swedish construction industry. • Psychosocial environment including job satisfaction; control of work situation; information about plans; work tasks alternating; supervisory support; support from workmates; a responsibility that is too heavy; work health hazard anxiety; work psychologically demanding; difficulties to relaxing during leisure time; hurrying without reason; sleeping problems; and depression.
Palmer et al. [42]	• Quantitative. Logistic regression. • Sampled 248 construction workers' patients in England, Scotland, and Wales. • Psychosocial factors include stress, job dissatisfaction, and limited control over job content.
Sun et al. [43]	• Review. Total 357 studies/reports studies that have been done in Hong Kong in the field of occupational health during the period 1966-1997. • Chemical hazards, dust and ergonomics (including psychosocial factors).
Holmstrom et al. [44]	• Quantitative. Multiple regression analysis using SPSS. • Sampled 1.773 construction workers in Sweden.

	• Psychosocial factors including discretion; qualitative demands; quantitative demands; solidarity work; support; understimulation; anxiety, health; anxiety, work; job satisfaction; life quality; psychic symptoms; psychosomatic symptoms; and stress.
Holmstrom et al. [45]	• Quantitative. Multiple regression analysis using SPSS. • Sampled 1.773 construction workers in Sweden. • Psychosocial factors including discretion; qualitative demands; quantitative demands; solidarity work; support; understimulation; anxiety, health; anxiety, work; job satisfaction; life quality; psychic symptoms; psychosomatic symptoms; and stress.
Theorell [46]	• Literature review of three different epidemiological studies. • Psychosocial factors include having grown up as a late child in a large family, hostility (with slow persons and in queues), breaking up from previous marriage, currently being a cigarette smoker, low decision latitude on the job, and bad social support at work.
Theorell et al. [47]	• Quantitative. Multiple regression equation. • A total of 8.973 male building construction workers in Stockholm. • Psychosocial factors include work conditions, economy, living conditions, family, personal habits, and background.
Theorell [15]	• Quantitative. Regression analysis. • A total of 5.155 construction building workers in Stockholm. • Psychosocial factors including the perception of work responsibility; ability to relax, after a normal work day; satisfaction with work; energy level in comparison to work mates; satisfaction with home life; the number of residential changes after age 15; hostility when faced with slow persons; hostility when being held up in queues; lived with both biological parent to age 15; and number of order among siblings.

2.6 Analysis of classification

In the final phase, the categorized journal articles underwent a process of comparison, differentiation, and rigorous assessment. To facilitate the organization and comprehension of findings from the available scholarly materials, we directed our attention toward establishing significant groupings about psychosocial factors prevalent among construction workers. Subsequently, during critical examination and discourse, we identified potential areas that can be carried out for future research. The necessary to underline that this paper, characterized as descriptive, aims to assess and categorize the extant literature concerning psychosocial factors in construction workers while also pinpointing prospects for future research. Consequently, a statistical methodology for article categorization was not employed.

3. RESULT AND DISCUSSION

Numerous researchers contend that the theoretical of framework of the job demand-resources (JD-R) model [4, 26, 34] or the job demand-control (JD-C) model [9, 29, 36, 37] underscores the significance of psychosocial elements within the domain of construction workers. JD encompass elements within the work that involve continuous physical and/or psychological (cognitive and emotional) exertion or abilities and are thus associated with distinct physiological and psychological expenses [48]. JR encompasses elements within the job that are functional in achieving work objectives, diminishing JD and the associated physiological and psychological costs, or promoting personal growth, learning, and development [49-51]. The demand-control model delineates the interplay between the demands of job and the freedom to make decisions, where job demands represent the psychological stress associated with fulfilling the workload, and decision latitude denotes the employee's potentially considerable control over assigned job tasks and work behavior [52, 53]. Figure 3 presents the overall use of the theoretical framework from the results of the literature review.

A different concept by Salem et al. [39] elucidate an alternative concept emphasizing the significance of psychosocial elements within the construction workforce, employing the person-environment (P-E) fit theory framework. The P-E fit theory can be assessed from an employee perspective concerning employee requirements and job provisions, which can be further explored in the context of needs-supplies. Additionally, it can be evaluated from a job standpoint concerning job demands and employee abilities, which can be elaborated in terms of demands-abilities.

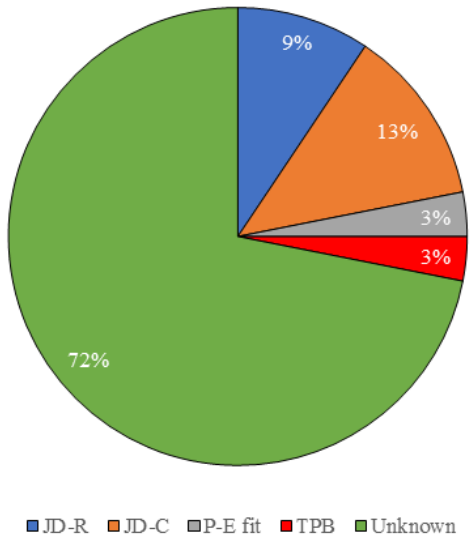

Figure 3. Theoretical framework

Besides that, Liu et al. [24] also explained a different theoretical discipline in discussing psychosocial factors in the workplace, namely the theory of planned behavior (TPB). Some of the uses of TPB as a well-known model that is quite widely known is to predict human intentions and behavior by observing several important predictors, including attitudes, subjective norms, and perceived behavioral control.

The level of possibility that someone will behave in a certain way can be called intention. The depiction of an individual's positive or negative perspective and comments about people, objects, and events can be interpreted as an attitude. The reference group's agreement with behavior can

be described as a subjective norm. The representation of an individual's perception of the availability of abilities, resources, and opportunities to carry out a specific behavior can be described as TPB. Based on this, a person will feel that he is more in control, and his behavioral intentions will increase, which in turn will have an impact on influencing his behavior.

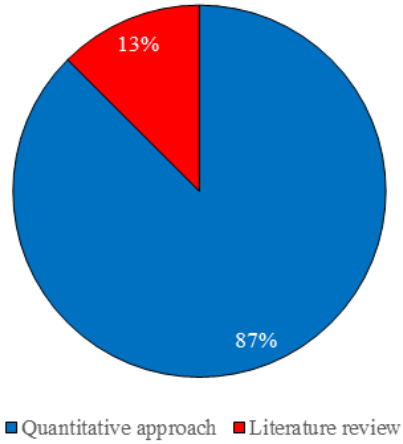

Figure 4. Analytical approaches

Regarding analytical approaches and techniques, 28 studies used a quantitative approach, while the remaining 4 used a literature review approach [4, 38, 43, 46]. This shows information that no one has researched the topic of psychosocial factors in construction sector workers using a qualitative approach or analysis technique. Figure 4 presents the composition of the use of analytical approaches from the results of the literature review.

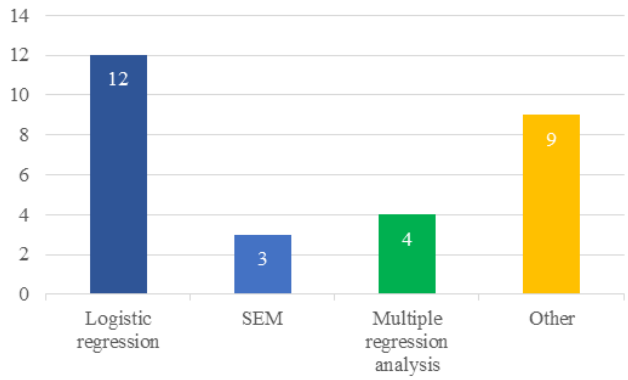

Figure 5. Analysis techniques

In data analysis techniques (seen in Figure 5), 12 articles used logistic regression; 4 articles used multiple regression analysis; 3 articles used structural equation modeling; as well as 1 article used Mann–Whitney U test, 1 article used competing risk regression, 1 article used MATLAB, 1 article used variance analysis and pearson's correlation matrix, 1 article used univariate analyses, 1 article used longitudinal random-intercept regression models, 1 article used linear regression models, 1 article used rapid entire body assessment method and 1 article used descriptive analysis and multiple correspondence analysis.

According to the geographical distribution in the research (seen in Figure 6), 5 studies were conducted in Sweden, 4 studies were undertaken in Spain and Netherlands, and 3 studies were undertaken in Australia. Additionally, 2 studies were undertaken in United States, and 1 study each took place in Indonesia, Thailand, Pakistan, Finland, Norway, Louisiana, France, Chinese, India, and England.

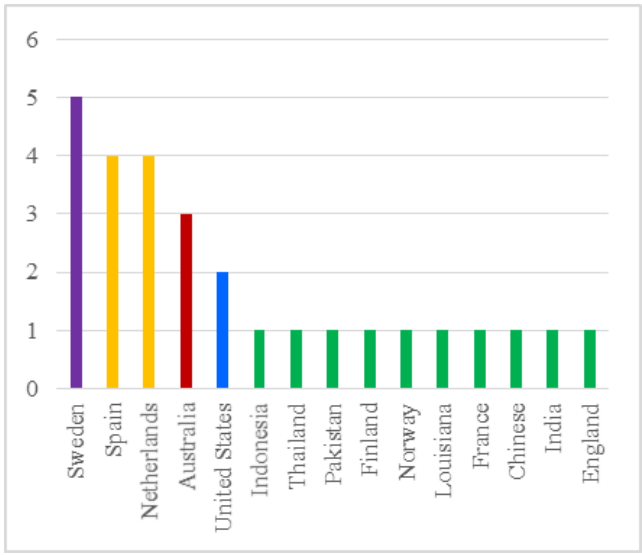

Figure 6. Geographical distribution

If viewed from the continental element, it can be seen that 7 countries are on the European continent (Sweden, Spain, Netherlands, Finland, Norway, France and England). A total of 5 countries are on the Asian continent (Indonesia, Thailand, Pakistan, China and India). A total of 2 countries are on the American continent (United States and Louisiana). The remaining 1 country, namely Australia, is on the Oceania continent. This shows that no one has researched the topic of psychosocial factors in construction sector workers from countries on the African continent.

3.1 Psychosocial factors research clusters in construction workers literature

We identified 8 distinct clusters of psychosocial factors that influence construction workers. To gain deeper insights and facilitate a comprehensive discussion, we utilized a specialized analytical framework comprised of eight research clusters to categorize and examine the 32 articles. The subsequent sections present the outcomes of this analysis.

Research cluster 1: demands. Job demands pertain to a job's physical, psychological, social, or organizational components requiring ongoing physical and/or psychological effort and, consequently, are connected with specific physiological and/or psychological costs [48]. Job demands are elevated levels of work-related pressure and emotionally burdensome interactions with clients or customers. These demands are typically assessed by measuring quantitative workload or role conflict, which refers to the competition for job-related role demands [51]. In light of the extensive literature review, aspect associated with job demands include psychological demand, high job demands, mental task demands, high quantitative job demands, high qualitative job demands, a responsibility that is too heavy, hurrying without reason, work psychologically demanding, and difficulties to relax during leisure time.

Research cluster 2: control. Job control is assessed as the capacity to determine the methods for accomplishing job tasks, often called job decision latitude [51]. Drawing from the

existing literature, the aspects associated with control encompass control latitude; career advancement; autonomy; low job control; personal development of the worker; independence at work; work-related concerns; work control; regulations; work engagement; communication skills; self-efficacy; mental and emotional competencies; job control; knowledge and beliefs regarding the effectiveness of controls; motivation, self-efficacy; rhythm; job variety and future perspective; work performance; individual growth; work effort; control of work situation; information about plans; limited control over job content; perceived behavioural control; subjective norm; and low decision latitude on the job.

Research cluster 3: support. The perceived availability of functional support stands as the most crucial component of social support. Functional support denotes the extent to which interpersonal connections fulfill specific utility. The uses most often referred to are (1) emotional support for someone which involves a sense of caring, love, and empathy; (2) support in instrumental terms (real support); (3) information, guidance, or feedback that can provide a solution to a problem; (4) assessment support related to the quality of information relevant to self-evaluation and; (5) social friendship, which involves and spends time together with other people in leisure activities and activities such as recreation [54]. According to the literature review, the aspects connected to support encompass relationships with coworkers; team cooperation; encouragement; support of colleagues and leaders; general social support; workplace social support; supervisor social support; social influence; physical environment; social organizational; coaching; technological; socio-economic fears; discretion; recognition at work; and solidarity work.

Research cluster 4: stress. Work stress is the body's response to psychological disorders that cannot be avoided in work activities and activities in daily life [55]. Within the challenging work setting of the construction sector, workers not only encounter elevated levels of work intensity but also potentially confront stringent project time frames, supervisory admonishments, and recurrent overtime obligations; all of which possess the ability to substantially influence their psychological well-being and contribute to the occurrence of stress related to work [56]. A comprehensive examination of the existing literature reveals various aspects related to stress, including future careers; organization as a trigger for stress; environmental as a trigger for stress; work-family as a trigger for stress; worry, distress, and stress reactions not primarily work-related.

Research cluster 5: condition. Working conditions encompass all aspects of the work environment that can impact employees in the execution of their assigned tasks. Drawing from the findings in the existing body of literature, aspects pertaining to working conditions encompass physically exhausting jobs; exposure to harmful conditions; workplace bullying; risk perception; experienced risk from work tasks and environment; work health hazard anxiety; sleeping problems; depression; underestimation; life quality; psychic symptoms; psychosomatic symptoms; hostility; cigarette smoker; living conditions; personal habits; ability to relax, after normal work day; energy level in comparison to workmates; the number of residential changes after age fifteen years; hostility when faced with slow persons; and hostility when being held up in queues.

Research cluster 6: satisfaction. Employee satisfaction is determined by their perception of the company's ability to meet their important needs within the workplace environment. As indicated in the literature review, the aspects associated with satisfaction encompass benefit perception attitude, risk perception attitude, salary, compensation, rules, leadership, promotion opportunities, co-workers, and home life.

Research cluster 7: description. The description is defined as a clear level of understanding of the expectations of the work performed, the scope of the work tasks assigned, and the responsibilities entrusted. In accordance with the literature examination, facets linked to descriptions encompass uneven distribution of work, daily task completion, well-defined tasks, role ambiguity, monotonousness of work, physical task content, mental task content, work tasks alternating, and perception of work responsibility.

Research cluster 8: conflict. Conflict is a condition when there are two or more different views, beliefs, desires, interests, needs, and values that are incongruent, opposing, and incompatible. Work–family conflict refers to an inter-role conflict that can occur when the level of expectations of a person's work role does not match the level of expectations of a person's family role [57]. Interpersonal conflict refers to interpersonal dispute unrelated to job duties issues and consists of three important things, that is, some form of interaction that happens between individuals, an interdependence that happens among individuals, and an incompatibility that happens based on perception or values [58]. The points concerning conflicts, as derived from the analysis of existing literature, encompass work–family conflict; interpersonal conflict; having grown up as a late child in a large family; separation from a previous marriage; family dynamics; familial background; living with both biological parents to age fifteen years; differences in treatment among siblings.

Based on this, it can be seen that the psychological factor dimension consists of demands, control, stress, and description. Meanwhile, the social factor dimension consists of support, condition, satisfaction, and conflict.

3.2 Theoretical and practical implication regarding psychosocial factors in the construction worker literature

In this section, we will study the journey of the development of this collection of information while scrutinizing pivotal discoveries concerning psychosocial variables in the literature surrounding construction workers. A brief summary based on important findings obtained from the analysis of 32 selected reputable international journal articles (taken from the Scopus database) regarding research topics related to psychosocial factors among construction workers can be seen in Table 2.

In terms of theoretical implications, this research contributes four theoretical framework based on previous research, namely JD-R model, JD-C model, P-E fit theory, and TPB model.

The JD-R model, previous research links psychosocial factors with safety performance, performance, and worker productivity. Meanwhile, the for JD-C model, previous research has linked psychosocial factors with respondent characteristics, including the respondent's gender, respondent's age, last level of education, length of work experience, work position, and average monthly income); working conditions, health and emotional well-being, job satisfaction, mental health complaints, occupational safety and health administration injury records, injuries/near misses, absent from work due to injury.

Table 2. Research topics related to psychosocial factors

Author	Key Finding
Tong et al. [4]	Worker safety performance is indirectly influenced by psychosocial factors which have an impact on the psychological working conditions of workers.
Dogbla et al. [23]	All sectors generally report the presence of psychosocial risk factors. Sectors that appear to report more exposure to psychosocial risk factors than workers in other sectors are workers in the construction, human health and social sectors. To develop an efficient prevention strategy for creating occupational health requires an analysis of exposure to psychosocial risk factors in the workplace.
Indrayana et al. [8]	In shaping the safety performance of construction projects, it has been proven to be very significantly influenced by the maturity of the nature and character of the leader, the psychosocial maturity of the project owner, the participatory maturity of the project owner, the maturity of the project owner's public communication, and the maturity of the project owner's safety competence.
Liu et al. [24]	Collaborative intentions and collaborative behavior between stakeholders in megaprojects are proven to be positively influenced by benefit perception attitudes, subjective norms and perceived behavioral control. Collaborative intentions were shown to be significantly inhibited by the attitudinal effect of risk perception. The relationship between psychosocial factors and collaborative intentions is moderated by megaproject culture, thereby impacting stakeholders' collaborative behavioral choices. The relationship between psychosocial factors and collaborative behavior is partially or completely mediated by collaborative intentions.
Pirzadeh et al. [7]	When experiencing poor working conditions there is a decline in the mental health of construction workers, and the magnitude of the effect of this decline increases as the number of work difficulties (psychosocial work quality) increases.
Ross et al. [25]	Suicidal thinking in the previous year was reported by almost one-third of the interns, and an estimated half to two-thirds of them know someone who has attempted or died by suicide. Someone who desires to commit suicide is often associated with greater psychological stress in life, consuming drugs, poor levels of well-being, and seeing someone who has attempted suicide.
Suriyanon and Sutheerawatthana [9]	A worker's likelihood of working in isolated, high-stress psychosocial work conditions is in descending order influenced by the worker's demographic characteristics. It is hoped that these results will provide in-depth insight into the risks of psychosocial factors in the construction sector.
Maqsoom et al [26]	The intrinsic workforce diversity model is part of psychosocial factors. Workers' skills continue to decline due to uneven employment, communication gaps in construction sector workers, and technical skills in construction sector workers, such as knowledge of technological equipment construction sector workers, and advances in construction technology construction sector workers, which are the most common psychosocial stressors.
Pérez-Alonso et al. [27]	Seven of the twelve psychosocial factors indicate a high level of worker risk (mobbing in construction sector workers, relationships in construction sector workers, recognition in construction sector workers, autonomy in construction sector workers, emotionality in construction sector workers, control in construction sector workers, and demands in construction sector workers).
Sirén et al. [28]	The contribution of psychosocial factors to the excess risk of retirement construction sector workers due to disability is small construction sector workers and only visible in monotonous work.
López-García et al. [10]	It is hoped that these results will provide in-depth insight into the risks of psychosocial factors in the construction sector. The possibility of occupational accidents has been proven to increase significantly due to workers' psychosocial factors.
Navarro-Abal et al. [29]	Perceptions of working conditions in construction sector workers, health and emotional well-being construction sector workers, as well as job satisfaction construction sector workers, have been proven to be influenced by psychosocial characteristics.
Moberg et al. [30]	Only the relationship between construction sector workers' hand grip strength and low back pain experienced by construction sector workers remained statistically significant, after adjusting for age, gender, and certain mechanical and psychosocial risk factors.
Pidd et al. [31]	Harm reduction strategies require psychosocial well-being interventions. It is hoped that these results will provide in-depth insight into the risks of psychosocial factors in the construction sector
van der Klauw et al. [32]	In both this research sectors, work accidents were proven to be influenced by psychosocial factors. Work accidents in the construction industry are associated with high time pressure and exposure to violence and harassment by co-workers or supervisors.
Das [33]	Insufficient income of construction sector workers, monotonous work of construction sector workers, and job dissatisfaction of construction sector workers result in the emergence of psychosocial risks, namely low back pain experienced by construction sector workers.
Lorente et al. [34]	As the main focus of positive psychosocial factors, personal resources and job resources can determine the level of work engagement and, therefore, self-assessment of job performance.
Van Deurssen et al. [35]	Knowledge and social influence (psychosocial factors) are suspected of having a significant role in the level of quartz exposure in the construction industry.
Boschman et al. [36]	Psychosocial risk factors for supervisors (compared to the general working population their mental demands are higher). Psychosocial risk factors for bricklayers (the bricklayers experienced worse job control, learning opportunities, and future perspective). So, these results will add to our insight into deeper
Abbe et al. [37]	Overall worker safety on construction sites must consider the psychosocial aspects of work, especially the stress experienced by construction workers.
Sobeih et al. [38]	The psychosocial factors that cause the most stress and significantly increase the risk of musculoskeletal disorders are economic and performance factors.
Salem et al. [39]	Mental task demands among construction workers and individual growth among construction workers (psychosocial factors) show a protective effect against musculoskeletal disorders, this is not easy to explain classical approaches where stress can only have negative effects.

Alavinia et al. [40]	A focus on reducing physical and psychosocial burdens in the workplace should be an intervention that aims to minimize and prevent the intention of construction sector workers to decide to leave the world of work.
Sobeih et al. [3]	Musculoskeletal disorders are caused by psychosocial factors. It is hoped that these results will provide in-depth insight into the risks of psychosocial factors in the construction sector.
Engholm and Holmström [41]	Reflecting individual characteristics (psychosocial factors), it is closely related to symptoms of health problems in all body locations (neck symptoms and sleep problems).
Palmer et al. [42]	In contrast to low back pain which has a physical component, psychosocial factors seem to have a more important influence.
Sun et al. [43]	Psychosocial factors include the dangers of chemicals, dust and ergonomics. So, these results will add to our insight into deeper psychosocial factors in the future.
Holmstrom et al. [44]	The stress index, as well as psychosomatic and psychic indices, are psychosocial factors that significantly influence the occurrence of low back pain among construction employees and chronic low back pain among construction employees.
Holmstrom et al. [45]	The problems commonly experienced are neck and shoulder problems among construction employees and neck and shoulder pain among construction employees is often associated with psychosocial risk factors rather than physical workload factors.
Theorell [46]	For a deeper understanding, it is highly recommended that a full understanding of the possible risk role of psychosocial factors in construction employee gastrointestinal illnesses requires research not only on construction patients who consult a doctor about these illnesses.
Theorell et al. [47]	Childhood circumstances of worker, education of worker, living conditions of worker, smoking habits of worker, alcohol habits of worker, and financial conditions of worker, are some of the psychosocial characteristics which is generally often discussed.
Theorell [15]	Illness or pathological findings are not caused by “life changes” that are not accompanied by “discord”. However, there was an increase in the rates of illness of hypertension, disease neurosis, and illness in general in subjects with “life crises” and “discord”. So, these results will add to our insight into deeper psychosocial factors in the future.

The P-E fit theory, previous research has linked psychosocial factors with musculoskeletal disorders and stress symptoms. Meanwhile, for the TPB model, previous research links psychosocial factors with collaborative intention, collaborative behavior, and megaproject culture.

In terms of practical implications, the selection of psychosocial factors is contingent upon the careful consideration of their impact on various aspects such as interpersonal conflict, work-family conflict, work stress, role ambiguity, autonomy, and social support. These factors, in turn, have an indirect effect on safety performance, either positively or negatively, by influencing the occupational psychology of individuals. Safety performance is also influenced by job stress, role ambiguity, work-family conflict, and interpersonal conflict, as they contribute to burnout and impact engagement. On the other hand, autonomy and social support play a crucial role in enhancing safety performance through increased engagement and reduced burnout. Moreover, considering many previous studies, work-family conflict, and autonomy have received more attention than other psychosocial factors. Therefore, total quality management (TQM) practices and gamification are needed to minimize these factors.

All stages and processes of supply chain management in the construction industry sector, and involving every company stakeholder to play their role is the application of TQM principles. The application of TQM should ideally commence from the initial conception of the project and continue through to its delivery and subsequent maintenance. This encompasses activities such as procuring materials, storing them appropriately, managing teams and projects in the construction sector, exhibiting sound leadership, and effectively managing communications while also incorporating the latest modern and innovative technology. By properly implementing TQM principles, one can expect to achieve time efficiency and cost savings, minimize waste, produce higher-quality work, decrease the need for rework, and enhance acceptance of deliverables and customer satisfaction. Furthermore, this approach has the potential to foster repeat patronage, improve safety performance, maximize profits, and cultivate stronger working relationships. Ultimately, the adequacy and effectiveness of TQM principles' implementation is of paramount importance [59]. Which must be balanced with a reasonable job demands level, a good mastery of job control, supported by supportive leadership and co-workers, minimizing employee stress levels, conducive working environment conditions, satisfying employee needs, clear job descriptions, and fair conflict management (psychosocial factors) that will guarantee the attainment of benefits minimize work accidents.

The literature on TQM divides total quality management practices into two groups, namely the first group is called human aspects and the second group is quality improvement practices. The human aspects group includes leadership, customer focus, supplier relationships, employee involvement, training and education as well as rewards and recognition. The quality improvement practice group includes the behavioral side of quality management (top management support, teamwork, and customer involvement), and the technical side focusing on tools and work processes of quality management (process control and improvement, product design, quality system improvement).

Given the conditions in the construction industry sector, it is often considered a sector that is slow to adopt advances in technological development and innovation [60-62], in an effort to produce better cultural change and a positive view of the sector, it is absolutely necessary to integrate gamification techniques into the activities and processes of the construction sector [63]. The concept of gamification is based on the purpose of designing an experience that resembles playing a game. Employers in the industry can employ various methods to incorporate game elements into the construction sector in order to foster a structured work environment. These methods include assigning points for the completion of tasks, providing rewards to employees who deliver project tasks on time, granting bonus points to those who successfully complete assignments without any accidents; and encouraging healthier competition among workers by offering additional badges or points so they can be motivated to complete work more quickly. This will ultimately improve the quality of psychosocial factors variable (job control, job demands, perceived rate of support, worker stress levels, conducive

work environment conditions, creation of job satisfaction, clear job descriptions, and minimized levels of conflict); while reducing accidents and injuries on construction sites.

4. CONCLUSIONS

In conclusion, our results show that psychosocial factors issues in construction workers' research have slowly increased in recent times. The in-depth literature review that we have carried out on 32 journal articles will be able to advance the current construction worker literature by selecting, grouping, and analyzing literature that discusses the issue of variable psychosocial factors published in reputable international journals published from 1976 to 2023. The papers analyzed look at various topics, use different theoretical frameworks, and use diverse research methodologies, with an average reliance on primary data. We developed dimensions of psychosocial factors with eight clusters of psychosocial factors issues in construction workers' research to compile a literature review and guide possible future research. The results indicate that the majority of authors focus their attention on dimensions such as demand, control, support, stress, condition, satisfaction, description, and conflict.

Several previous studies have classified six activity sectors that allow exposure to psychosocial factors. The human health sector and social workers are most frequently affected. Next, it is positioned by the public administration sector and supporting service activities, the manufacturing industry, the transportation and storage sector, the motor vehicle trade and repair industry, and finally, the construction sector. Further research can be applied to sports organizations, banking, aviation, e-commerce innovative industries, and coal mining companies.

As such, this paper offers significant perspectives on the historical trajectory of research and identifies the gaps that require further investigation in relation to the crucial subject matter of psychosocial factors dimensions in the field of construction worker sector research. Moreover, we propose that scholars should devote considerable attention to exploring additional variables that could enhance comprehension of the underlying mechanisms associated with psychosocial factors, specifically TQM practice and the application of gamification.

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