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Burnout 4.0: Emotional intelligence as a strategy for preventing mental illness and turnover in WMS and automated picking operations.

Burnout 4.0: emotional intelligence as a strategy to prevent mental illness and turnover in WMS and automated picking operations

Burnout 4.0: emotional intelligence as a strategy to prevent the deterioration of mental health and personnel rotation in WMS operations and automated picking

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Summary:

This article analyzes emotional intelligence as a resource for preventing mental illness and the intention to leave in logistics operations driven by Warehouse Management Systems (WMS) and automated picking technologies. An integrative review of 15 national and international publications, published between 2022 and 2025 and located in institutional repositories, official journal websites, and multilateral organizations, was adopted. The synthesis was organized according to the work demands and resources model and examined four axes: digital intensification and monitoring; cognitive load and human-machine interaction; burnout and turnover; interventions based on emotional competencies and organizational design. The results indicate that automation can reduce travel, errors, and physical effort, but can also increase time pressure, technological dependence, surveillance, ambiguity of responsibilities, and loss of autonomy when the system is configured solely to increase productivity. Emotional intelligence promotes self-awareness, impulse regulation, communication, and seeking support, showing an inverse association with stress, burnout, and the intention to leave. Its preventive effect, however, is limited when goals, scales, breaks, sizing, and algorithmic governance remain inadequate. A multi-level model is proposed that combines job redesign, emotionally competent leadership, operator participation, situated training, and preventive indicators. It is concluded that sustainable prevention requires treating emotional intelligence as a collective and organizational resource, without transferring to the worker the exclusive responsibility for enduring harmful conditions.

Keywords:

Burnout. Emotional intelligence. Warehouse management. Automated picking. Turnover.

Abstract:

This article examines emotional intelligence as a resource for preventing mental illness and turnover intention in logistics operations managed by Warehouse Management Systems (WMS) and automated picking technologies. An integrative review was conducted using 15 national and international publications issued between 2022 and 2025 and retrieved from institutional repositories, official journal websites, and multilateral organizations. The synthesis was guided by Job Demands–Resources theory and addressed four analytical axes: digital work intensification and monitoring; cognitive workload and human–machine interaction; burnout and turnover; and interventions based on emotional competencies and organizational design.

The evidence indicates that automation can reduce travel, errors, and physical strain, while also increasing time pressure, technological dependence, surveillance, role ambiguity, and loss of autonomy when systems are configured solely for productivity. Emotional intelligence supports self-awareness, impulse regulation, communication, and help-seeking and is negatively associated with stress, burnout, and turnover intention. Its preventive effect is nevertheless constrained when targets, shifts, breaks, staffing, and algorithmic governance remain

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inadequate. A multilevel prevention model is proposed, combining work redesign, emotionally competent leadership, operator participation, situated training, and preventive indicators.
Sustainable prevention therefore requires emotional intelligence to be treated as a collective and organizational resource rather than a mechanism that shifts responsibility for harmful working conditions onto individual employees.

Keywords:
Burnout. Emotional intelligence. Warehouse management. Automated picking. Turnover.

Summary:

This article analyzes emotional intelligence as a resource to prevent the deterioration of mental health and the intention to abandon employment in logistical operations guided by warehouse management systems (WMS) and automated picking technologies. An integrative review of 15 national and international publications was carried out from 2022 to 2025, located in institutional repositories, official magazine websites and multilateral organizations. The synthesis is organized through the model of demands and labor resources and examines four projects: intensification and digital monitoring; cognitive load and person-machine interaction; burnout and rotation; and interventions based on emotional skills and organizational design. The results indicate that automation can reduce space, errors and physical effort, but also increase time pressure, technological dependence, surveillance, ambiguity of responsibilities and loss of autonomy when seeking to increase productivity. Emotional intelligence favors self-awareness, regulation of impulses, communication and seeking support, and is inversely associated with stress, burnout and intention to escape. Its preventive effect is limited when inadequate goals, shifts, pauses, allocations and algorithmic governance persist. A multilevel model is proposed that combines work redesign, emotionally competent leadership, operator participation, situated training and preventive indicators. Sustainable prevention requires treating emotional intelligence as a collective and organizational resource, without holding the worker exclusively responsible for enduring harmful conditions.

Keywords:
Burnout. Emotional intelligence. Warehouse management. Automated picking. Rotation of personal.

1. Introduction

The digitalization of distribution centers has changed the relationship between work, time, and Operational control. The WMS has ceased to function solely as a database for inventory registration and It began to organize sequences, distribute tasks, record times, compare performances, and... Connecting workers to data collectors, voice systems, light devices, and virtual reality glasses. augmented and mobile robots.

In picking, these decisions are updated in seconds and make almost everything visible. Interruption of flow. The same infrastructure that reduces errors and displacements can, therefore, To convert small human variations into continuously measured performance deviations. The problem lies not in the technology in isolation, but in the way goals, parameters, and authority are handled.

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are incorporated into the work system (LORSON; FÜGENER; HÜBNER, 2023; EU-OSHA, 2022).

The term Burnout 4.0 is used in this study as an analytical category for to designate the burnout produced or aggravated by digitally-based production environments. integrated. A new clinical classification is not being proposed.

The term describes a configuration in which traditional requirements, such as effort Repetitive work, shift work, and pressure to meet volume demands combine with monitoring in real-time, software-prescribed pace, continuous technological learning, and reduction of Decision margins. The World Health Organization places burnout in the occupational field. and recommends that mental health protection prioritize interventions addressing psychosocial risks. work organization and managerial capacity, avoiding restricting the response to measures. individual (WHO, 2022a; WHO; ILO, 2022).

In warehousing operations, productivity depends on precise coordination between People, inventory, equipment, and information. A registration error, inadequate slotting, Unavailability of the carrier or an interface error may interrupt the separator's task. although the indicator only records the time exceeded. This dissociation between responsibility Formal and effective control creates tension: the operator is responsible for the outcome without mastering all the aspects. conditions that produced it. Data-driven management systems can improve the balancing and security, but also to intensify activity and reduce autonomy when their criteria dictate. They are opaque or employed in a punitive manner (EU-OSHA, 2022; EU-OSHA, 2024).

Recent studies on picking demonstrate that the human effect of automation is not... uniform. Experiments with different technologies identify variations in perceived load. Satisfaction, self-efficacy, and execution time. Collaboration with robots can increase satisfaction. and trust when the control dynamics are understandable and the worker receives the conditions to adapt. Assistive technologies can also reduce cognitive load, although the The result depends on the interface, the task design, and the user's familiarity with it. (PASPARAKIS; DE VRIES; DE KOSTER, 2023; CHONDROMATIDIS et al., 2024; LUCCHESE; PANAGOU; SGARBOSSA, 2025).

Emotional intelligence enters this debate as the ability to perceive and understand. and regulate one's own and others' emotions, as well as use affective information in decision-making. decision. In an automated warehouse, it can support the early recognition of irritation, fear, fatigue, and a sense of injustice; encourage asking for help before mistakes accumulate; and improve communication during outages, peak demand, or task changes. Goal-Analyses show a positive association between emotional intelligence and satisfaction and commitment.

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and performance and a negative relationship with stress and burnout. There is also evidence that emotional competencies can be developed through structured training (DOÿRU, 2022; MENDONÇA; SANTANA; BUENO, 2023; POWELL et al., 2024).

It would be inappropriate, however, to transform emotional intelligence into a requirement for tolerance. impossible goals. When wellness programs teach breathing, resilience, or self-control without reviewing workload, breaks, sizing, and supervision practices, a An organization individualizes a risk that it itself produces. Recent health literature Mental health at work supports a preventative hierarchy: eliminate or reduce psychosocial factors. Initially, strengthen collective resources and only then offer interventions aimed at individual. Emotional competence is most useful when it enhances the capacity of participation and risk signaling, and not when it silences legitimate conflicts (WHO, 2022a; WHO; ILO, 2022; DEMEROUTI; BAKKER, 2023).

Turnover is a strategic consequence because it involves the departure of workers. Experienced individuals compromise tacit knowledge, safety, and workflow stability. In picking Automated, the domain of operation involves interpreting exceptions, recognizing failures of Address, work around outages, and interact with maintenance, quality, and shipping. A Frequent substitution increases learning time and can increase dependence. Digital instructions, creating a new cycle of pressure on remaining teams. Evidence. Empirical studies associate higher emotional intelligence with less burnout and a lower intention to leave. but they warn that environmental and leadership characteristics remain decisive (GALANIS et al., 2024; MARQUES; CARLOTTO, 2024).

Given this scenario, the following question arises: in what way does intelligence Emotional well-being can be integrated into an organizational strategy capable of preventing mental illness. What about turnover in WMS operations and automated picking? The overall goal is to analyze the mechanisms by which digital demands and emotional resources influence burnout and Intention to terminate the contract. Specifically, the aim is to characterize the risks. psychosocial aspects inherent to these operations, examine the limits and contributions of intelligence. emotional, relating burnout to decisions about staying in the workforce and proposing a preventative arrangement applicable to logistics management.

The scientific relevance stems from the fragmentation of the literature. Logistics studies. They tend to prioritize performance, time, and accuracy, while research on burnout and Emotional intelligence focuses on health, education, and services. The approach between These fields allow for the transfer of theoretical mechanisms without assuming equivalence between them. Occupations. Time pressure, low autonomy, monitoring, leadership resources and

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Emotional regulation is a cross-cutting variable; however, its modes of manifestation in the WMS and in Picking requires situated interpretation. This delimitation preserves the usefulness of the evidence and prevents causal extrapolations beyond the design of each study (LORSON; FÜGENER; HÜBNER, 2023; MENDONÇA; SANTANA; BUENO, 2023).

The article is organized into four parts in addition to this introduction. The theoretical framework It features Burnout 4.0, demands of automated operations, emotional intelligence and turnover. Next, the integrative review and its criteria are described. The results articulate The 15 sources, in a critical synthesis, support a multi-level prevention model. The final considerations revisit the research question, record limitations, and indicate implications. For managers, occupational health professionals, and researchers.

2. Theoretical Framework

2.1 Burnout 4.0 and the Demand and Resource Model

Burnout results from prolonged exposure to work demands that consume... energy without sufficient compensation from recovery, control, support and resources Recognition. The theory of labor demands and resources provides an adequate basis. because it doesn't establish a single list of factors: each occupation has specific requirements, but the The deterioration process tends to emerge when high demands drain physical resources and psychological. (DEMEROUTI; BAKKER, 2023).

In Burnout 4.0, the pressure doesn't depend solely on the number of tasks. It stems from... also from the information architecture that reduces the interval between command, execution and Evaluation. The WMS calculates priorities, routes the next mission, and records its completion; Picking devices translate this command into visual, auditory, or spatial stimuli. When the parameters ignore item variability, congestion, ergonomics and Through experience, average efficiency becomes the individual norm. The worker then adjusts. your body and attention to the system's timing, which favors intensification and a feeling of control. external (EU-OSHA, 2022; CHONDROMATIDIS et al., 2024).

Exhaustion appears as a response to continued energy expenditure; distancing Mental indifference can take the form of indifference towards quality, colleagues, or others.

objectives; and the perception of low effectiveness arises when the indicators obscure obstacles outside the objectives; and the perception of low effectiveness arises when the indicators obscure obstacles outside the objectives.

of individual reach. In highly measurable environments, this third component deserves Attention. An operator can perform complex tasks adequately and still receive

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Negative feedback from systemic events. If management fails to distinguish human error, limitation.
Due to technical constraints and process limitations, the productivity dashboard becomes a source of perceived injustice.
and a threat to professional identity (EU-OSHA, 2024).

Automation can also generate qualitative under-objectives. The elimination of displacements
Simple decisions reduce effort, but excessively fragmented tasks can produce problems.
Monotony, boredom, and loss of meaning. When the worker merely confirms commands, their
Experience ceases to be a resource for the system. This condition does not contradict overload: it is
It is possible to have an intense pace with impoverished content. The psychosocial risk results from...
a combination of repetition, vigilance, and reduced influence over the method, even when the cognitive
demand of each movement seems small (LORSON; FÜGENER; HÜBNER,
2023; EU-OSHA, 2024).

The literature on mental health in the workplace recommends separating risk, outcome, and
Diagnosis. Time pressure, low autonomy, and insufficient support are psychosocial risks;
Fatigue, irritability, difficulty concentrating, and sleep disturbances can be signs;
Burnout is an occupational phenomenon; anxiety or depressive disorders require evaluation.
This distinction prevents managers from diagnosing workers based on clinical indicators.
operational and prevents internal programs from replacing professional assistance. A
The organization must establish intake and referral flows while preserving
confidentiality and non-discrimination (WHO, 2022a; WHO; ILO, 2022).

Primary prevention acts before illness occurs by reviewing goals, schedules, breaks,
Interfaces, task distribution, and monitoring criteria. Secondary prevention.
It identifies early signs and offers resources to cope with stressful situations. Prevention.
Tertiary care promotes care, return to work, and adaptations for those who already have symptoms.
commitment. Emotional intelligence plays a significant role in the first two, but
It can also improve reception in the third stage. Its effectiveness depends on an environment in
that reporting difficulties does not result in punishment, loss of opportunities, or undue exposure (WHO,
2022a).

2.2 WMS, automated picking and psychosocial risks

The WMS integrates inventory, addressing, picking waves, replenishment, verification and...
expedition. In mature operations, the system enhances traceability and reduces uncertainty; in
Poorly managed implementations can consolidate flawed decisions and distribute them widely.
Scale. Human risk arises when the indicator replaces an understanding of the process. Rates.

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Aggregated hourly line counts, for example, lose comparative validity if they do not consider distance, weight, volume, height, congestion, device type, and incidence of exceptions. (EU-OSHA, 2022; KOREIS; LOSKE; KLUMPP, 2025).

Picker-to-parts technologies present distinct burdens. Collectors by Radio frequency requires manual consultations and confirmations; pick-to-light reduces visual search in Signaled positions; voice systems free up hands and eyes, but impose an auditory cadence; Pick-by-vision overlays instructions onto the visual field. In the laboratory, the combination of Technology and task configuration altered perceived time and workload, and pick-to-light showed advantage under certain conditions. The central fact is contingent: there is no interface. universally superior, due to the volume, variety, familiarity, and design of the orders. They modulate the experience (CHONDROMATIDIS et al., 2024).

Lucchese, Panagou, and Sgarbossa observed that cognitively assistive technologies They can support decision-making and well-being, with results favorable to pick-to-light in the scenario. experimental. The conclusion does not authorize choosing a technology solely based on the shortest average time. The sample size, the controlled environment, and the duration of contact limit generalizations for shifts. full seasons and seasonal peaks.

A solution that reduces initial load can become monotonous or intrusive after use. prolonged; another, more demanding in training, can offer greater autonomy when mastered. Implementation evaluations need to combine performance, perception, errors, safety and longitudinal learning (LUCCHESE; PANAGOU; SGARBOSSA, 2025).

In collaboration with robots, the mode of coordination influences how the worker... perceives control and competence. Pasparakis, De Vries, and De Koster identified improvement in satisfaction in dynamics where the human leads or follows the robot, with effects on Self-esteem and self-efficacy. The finding shows that relinquishing some control does not equate to... automatically losing psychological autonomy; predictability, trust, and clarity of roles. They can make collaboration acceptable. Still, perceived autonomy must be accompanied on the field, especially when a route is refused, slowed down, or paused. They are not operationally permitted (PASPARAKIS; DE VRIES; DE KOSTER, 2023).

A significant reduction in picking time was observed in a hybrid configuration. but noted that weight, density, and distance affect gains. This heterogeneity It matters for mental health. Revised goals based on the best-case scenario can be punishing. Workers allocated to less favorable orders. Responsible management should estimate ranges. by task family, recognize adaptation periods and prevent technical gains from being lost. entirely converted into acceleration, so part of the benefit needs to finance pauses,

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safety and recovery, preserving human capacity throughout the shift (KOREIS; LOSKE; KLUMPP, 2025).

Algorithmic management adds risks of opacity. The operator may not know why. received a specific mission, how was their performance normalized, or what data... They influence evaluations. The lack of explainability makes it difficult to challenge errors and fuels... distrust. EU-OSHA links artificial intelligence-based management systems to Performance pressure, intensification, loss of control, reduced support, and individualization. Although a WMS is not necessarily artificial intelligence, its prioritization modules and monitoring can produce similar effects when automated decisions are made. not very transparent (EU-OSHA, 2022).

Another tension involves surveillance and security. Detailed data can identify almost-Accidents, overload, and bottlenecks, favoring prevention. The same records can support Public rankings, punitive comparisons, and sanctions without contextual analysis. The effect depends. a legitimate policy should explicitly state the purpose, access, and consequences of data use. What information is collected, how long it is kept, who accesses it, and how? The worker can correct inconsistencies. The participation of operators in defining these Rules reduce asymmetry and improve the quality of diagnosis (EU-OSHA, 2024).

The presence of exceptions brings automated work closer to emotional activity. Failure, stock discrepancy, refused reading, and route blockage disrupt a flow. conceived as continuous. The operator needs to manage frustration, communicate the problem and decide between waiting, escalating, or following an alternative procedure. If supervisors handle Exceptions, such as individual fault, are something the team learns to conceal or improvise. If they treat them as In terms of process information, the incident becomes a source of learning. Emotional competence. Leadership, therefore, modifies the psychosocial consequences of the same technical failure.

Peak demand increases this vulnerability. Temporary hires, hours additional costs, higher density of people and inventory, pressure from deadlines, and reduced availability. Support needs coincide with the requirement for rapid learning. The WMS can balance work, but parameters focused solely on throughput tend to reduce the necessary headroom for recovery and problem solving. During these periods, prevention requires reinforcement of training, planned micro-pauses, scaling criteria, rotation compatible with skills and daily review of signs of overload, without confusing total availability with commitment (WHO; ILO, 2022; EU-OSHA, 2024).

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2.3 Emotional intelligence as a personal, relational, and managerial resource

Emotional intelligence can be understood in dimensions of perception, Understanding, using, and regulating emotions. On a personal level, it allows one to recognize states that They alter attention and judgment. On a relational level, it helps to interpret signals from colleagues and adjust. communication. At the managerial level, it supports feedback, conflict mediation, and decision-making. under pressure. Doÿru's meta-analysis found favorable relationships with satisfaction, commitment, organizational citizenship and performance, as well as negative association with stress. This supports its relevance as a work resource, but does not prove that it neutralizes extreme demands (DOÿRU, 2022).

The Brazilian meta-analysis by Mendonça, Santana, and Bueno identified a negative relationship. between emotional intelligence and burnout, with variations related to measurement models. and sample characteristics. This heterogeneity calls for precision. Programs Corporate bodies need to communicate the concept they adopt and the behaviors they intend to achieve. develop and how they will evaluate change. Mix empathy, personality, motivation and Communication under a generic label produces training that is difficult to verify. For operations In logistics, the focus should be on observable competencies during critical events. (MENDONÇA; SANTANA; BUENO, 2023).

These skills include recognizing activation signals before acting. impulsively; naming the emotion without turning perception into accusation; distinguishing Operational urgency of personal threat; request support; offer descriptive feedback; and recover Focus after an interruption. In an environment with noise, displacement, and sequential commands, Long techniques have low adoption. Development needs to occur scenario by scenario: failure of collector, robot queue, address discrepancy, revised target, priority conflict and Approaching fatigue. Situated learning connects emotional language to decisions. concrete safety and quality standards.

Marques and Carlotto, when applying the demands and resources model to psychologists Clinical studies have shown that emotional intelligence and self-efficacy function as resources. while emotional demands and job characteristics contribute to dimensions of Burnout. Although the occupation is distinct, the mechanism offers a useful inference: resources. Personal factors affect how claims are processed, but their protection depends on the labor structure. The transfer to warehouses should be tested, not assumed, through studies with operators. of WMS and picking (MARQUES; CARLOTTO, 2024).

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The study by Galanis and colleagues, involving 992 nurses, found relationships
Negative correlations exist between emotional intelligence, burnout, quiet quitting, and turnover intention.
Self-control and well-being showed relevant associations with exit intention.
The result reinforces the hypothesis that emotional skills favor retention, although
The cross-sectional design does not allow us to assert causality. For logistics, the contribution lies in...
Integration of outcomes: psychological withdrawal, burnout, and intention to leave may
compose a progressive process, detectable before shutdown (GALANIS et al., 2024).

There is evidence of trainability. The systematic review and meta-analysis by Powell and
Collaborators gathered longitudinal interventions with health professionals and observed improvement.
Emotional intelligence training. Its application in logistics requires adaptation.
Content and evaluation. Isolated workshops, disconnected from real problems, tend to generate...
Declarative knowledge without operational change (POWELL et al., 2024).

Leadership is the bridge between individual competence and collective resources. Supervisors
They set the tone for the start of the shift, interpret indicators, and respond to requests for assistance. One
An emotionally competent leader does not abandon goals; he distinguishes between fact, context, and...
Judgment is crucial; corrections are made without humiliation, and the person is aware of when insistence increases risk.
It also transmits line information to process engineering. This function prevents the
emotional intelligence is not limited to the operator's self-regulation and is transformed into a capability.
of governance.

Psychological safety is a condition of use. The worker only reports exhaustion, doubt, or
It's a mistake to believe that communication will be examined fairly. Embarrassing rankings,
Irony and automatic punishment encourage defensive silence. Emotional intelligence must be present.
associated with clear escalation channels, the right to interrupt an unsafe task, and feedback.
regarding recorded problems. Without this drawing, the person can perceive the emotion and still...
to rationally conclude that hiding it is the least risky option (EU-OSHA, 2022; WHO;
ILO, 2022).

It is also necessary to avoid emotional surveillance. Facial recognition, analysis of
Voice or automatic inference of humor should not be presented as intelligence.
Organizational emotional intelligence. Beyond technical limitations and biases, these practices can enhance...
Monitoring and distrust. The preventive program should prioritize voluntary self-reporting.
Qualified conversation, aggregated indicators, and data protection. Emotions are information.
Contextual metrics, not productivity metrics. Governance needs to prevent data from being used in a way that is too broad.
be used in promotion, dismissal or disciplinary assessment (EU-OSHA, 2022; EU-
OSHA, 2024).

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2.4 Burnout, intention to shut down, and operational stability

The intention to terminate an employee should not be confused with actual turnover, but it functions as such. leading indicator. It synthesizes cost assessment, alternatives, and feasibility. Permanence. Burnout can increase this intention by reducing energy, satisfaction, and identification. with the work. In automated operations, there is also a component of substitutability. perceived: workers treated as interchangeable extensions of the system may conclude that the bond offers little recognition. Leaving becomes a response to the loss of resources. especially when another company offers more predictable pace, scale, or leadership (GALANIS) et al., 2024; DEMEROUTI; BAKKER, 2023).

The cost of turnover exceeds recruitment. The team loses knowledge about Similar products, safe shortcuts, packaging exceptions, failure patterns and Communication between areas. Newcomers require supervision precisely when the situation is challenging. It is reduced. If the target remains unchanged, experienced workers absorb the workload. additional work increases their own risk of burnout. A cycle is formed in which disconnections Increased demand accelerates burnout, and burnout leads to new intentions to leave.

Automation can break or reinforce this cycle. Clear interfaces, reduced effort, Equitable balancing and robotic support promote satisfaction and self-efficacy. Goals Automatic systems, surveillance, low autonomy, and recurring failures have the opposite effect. Experiments with human-robot collaboration reveal that subjective experience depends on... Interaction design. Therefore, retention should not be addressed solely through compensation or selection. of robust profiles; it requires evaluating how each technological configuration redistributes control, competence and recognition (PASPARAKIS; DE VRIES; DE KOSTER, 2023; LORSON; FÜGENER; HÜBNER, 2023).

Retention indicators need to be analyzed by team, shift, area, technology, time in the company and implementation phase. An overall average may mask a concentration of exits in Exit interviews provide information about specific seasons, leaders, or periods. Late and subject to filters. Brief climate surveys, stay conversations, records of Transfers, absenteeism, overtime, and incidents complement the analysis. Data should They should be aggregated and protected to prevent risk monitoring from creating another risk.

Emotional intelligence can reduce the escalation between discomfort and exit by improving Recognition, communication, and resource negotiation. However, if management receives the report and While not addressing the root cause, the ability to name the problem can accelerate a decision.

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Fully rational termination. Retention is not an absolute goal; keeping people in
A harmful context does not constitute success. The preventive objective is to create sustainable conditions.
in which remaining is compatible with health, dignity, and professional development.
(WHO, 2022a; WHO; ILO, 2022).

3. Materials and methods

An integrative review of a qualitative, exploratory, and analytical nature was conducted.
deductive. The method was chosen because the question connects fields with distinct traditions:
Occupational health, organizational psychology, operations management, and human interaction.
machine. The review does not intend to estimate the prevalence of burnout among operators, as it does not
Sufficient and homogeneous epidemiological studies were found in this population. Their
The purpose is to integrate mechanisms, results, and recommendations capable of providing a foundation for...
A specific preventative model for WMS and automated picking.

The search was conducted in September 2026 on official journal websites and PubMed.
Central, SciELO, university repositories, and portals of international organizations. These were
Combined, in Portuguese and English, descriptors equivalent to burnout, emotional intelligence,
turnover intention, warehouse, order picking, warehouse management system, human-robot
collaboration, algorithmic management, psychosocial risk and workplace intervention.
Cross-references were consulted only to locate official versions; the final inclusion
It required an editorial page, an active DOI, an institutional ISBN, or registration with a responsible organization.

Publications between 2022 and 2026 that addressed at least one of the following were included.
The following are the key themes: psychosocial risks of digitalization; demands and resources of work;
Emotional intelligence and burnout; emotional intelligence and turnover; interventions of
emotional development; human factors in warehousing, picking or collaboration with
Robots. Commercial texts, unedited posts, and unauthored works were excluded.
verifiable, duplicates, studies prior to 2022, and sources whose relevance to the question is...
It was limited to peripheral mentions of technology or well-being.

The final sample comprised 15 documents: four institutional publications from the WHO and ILO.
and EU-OSHA; six articles on psychology, occupational health, or organizational behavior;
and five studies of warehousing and picking operations. For each item, the year was recorded,
context, design, constructs, main contribution, and transferability limits. The presence of
The use of distinct sectoral sources was deliberate, as the literature directly dedicated to burnout...

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The development of WMS operators is in its early stages. Inferences regarding logistics were marked as a synthesis. theoretical, not as a proven causal effect in this population.

The analysis took place in three stages. First, the evidence was coded as Demands, resources, outcomes, or interventions, based on the theory of demands and resources. Later, convergences were identified between studies of logistics and mental health. especially in autonomy, cognitive load, support, monitoring, satisfaction, and intention to exit. Finally, a prevention matrix was developed at the organizational, managerial, and exit levels. collective and individual. Recommendations were accepted only when compatible with the The preventive hierarchy proposed by the WHO and the digital risks described by EU-OSHA.

The quality was appreciated for its editorial origin, methodological transparency, and adherence. Thematic analysis and caution in inference. Meta-analyses and documents based on evidence synthesis. general relationships were supported; experiments and field studies in picking informed technological mechanisms; cross-sectional studies were used as an association, without Causal language. As limitations, there was no registered protocol, evaluation by two reviewers. or its own meta-analysis. These restrictions are revisited in the discussion and prevent classifying the The proposed model is an intervention that has already been validated.

4. Results and discussion

4.1 Synthesis of selected evidence

The synthesis revealed convergence around one principle: the effects of technology on Health and retention are mediated by job design. In studies of picking, automation and Digital assistance has altered time, perceived workload, satisfaction, and self-efficacy. (Sources of...) Occupational health, time pressure, lack of autonomy, insufficient support, and opacity. They emerged as risks. In research on emotional intelligence, self-awareness, regulation and sociability were associated with better outcomes. None of these blocks, in isolation, explains Burnout 4.0; its contribution emerges from the articulation between technological demand, Emotional resources and organizational context.

Source	Type	Context	Contribution to the study
WHO (2022a)	Guideline	Mental health in the workplace prioritizes organizational interventions and the prevention of psychosocial risks.	

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Source	Type	Context	Contribution to the study
WHO; ILO (2022)	Policy brief	Policies and management	It integrates prevention, promotion, support, and inclusion in the workplace.
EU-OSHA (2022)	Report	Algorithmic management	It relates to monitoring, intensification, low autonomy, and burnout.
EU-OSHA (2024)	Report	Digitization	It maps cognitive load, insecurity, opacity, and participatory solutions.
Demerouti; Bakker (2023)	Theoretical	Demands and resources	It explains cycles of resource loss, exhaustion, and adaptation in crises.
Doÿru (2022)	Meta-analysis	Results at work	It links emotional intelligence to less stress and better attitudes.
Mendonça et al. (2023)	Meta-analysis	IE and burnout	Identifies inverse relationships and heterogeneity between measurements and samples.
Powell et al. (2024)	Review and meta-analysis	IE Training	This indicates that emotional skills can be developed.
Galanis et al. (2024)	Transversal	Health	Higher emotional intelligence (IE) is associated with lower burnout rates and turnover intention.
Marks; Carlotto (2024) Transversal		Clinical psychology	Tests EI and self-efficacy as resources in the face of emotional demands.
Lorson et al. (2023)	Review and interviews	Automated warehouses systematize human factors and	their interaction with robotic systems.
Pasparakis et al. (2023)	Experiment	Collaborative picking	Evaluate autonomy, satisfaction, self-esteem, and self-efficacy with robots.
Chondromatidis et al. (2024)	Experiment	Picking technologies	Compares time and perceived charge in RF, light, and vision.
Lucchese et al. (2025)	Experiment	Assembly and picking	It examines assistive technology, performance, and well-being.
Koreis et al. (2025)	Longitudinal study	Hybrid picking	It shows time gains conditioned by weight, density, and distance.

Table 1 – Summary of selected sources Source: own elaboration (2026).

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The four logistics studies challenge the idea that productivity and well-being are linked. They always walk in opposite directions. Adequate assistance can reduce the search for, and decision-making. Redundant and displacement, freeing up resources. The problem begins when the technical gain It immediately redefines the expected standard and eliminates the slack obtained. In this situation, innovation It reduces the workload per task, but increases the number of tasks until the workload is restored or exceeded. previous. Evaluating only cycle time masks this rebound effect (CHONDROMATIDIS et al., 2024; LUCCHESE; PANAGOU; SGARBOSSA, 2025).

Autonomy has taken on a more complex meaning than simply total freedom to choose. any procedure. Workers may accept instructions from robots and systems when They understand the logic, trust the equipment, and maintain the possibility of intervention. Relevant autonomy includes the ability to report exceptions, pause for safety, dispute data, and... participate in adjustments. The experiment by Pasparakis and colleagues argues that different Control distributions can generate satisfaction; EU-OSHA adds that opacity and surveillance undermines this potential (PASPARAKIS; DE VRIES; DE KOSTER, 2023; EU-OSHA, 2022).

Emotional intelligence functions as a translation tool. It helps to convert A diffuse feeling regarding communicable information: pressure, fear of making mistakes, irritation with the interface. insecurity in the face of the robot or perception of injustice. This translation improves the chance of early intervention. However, the organization needs to have channels capable of receiving the information and authority to change the process. Without a response, personal resources are exhausted and This can lead to cynicism, as the worker realizes that communicating does not change the situation. (DEMEROUTI; BAKKER, 2023; MENDONÇA; SANTANA; BUENO, 2023).

The results from Galanis and colleagues are especially relevant when relating Emotional intelligence, burnout, and turnover intention in the same model. The transfer to Logistics must keep two things in mind: participants were nurses and the design was cross-sectional. captures association. Still, the mechanism is consistent with Doÿru's meta-analysis and with the A model of demands and resources. Self-control, well-being, and sociability can support... coping and bonding, provided they are not consumed by chronic demands with no possibility of recovery (DOÿRU, 2022; GALANIS et al., 2024).

The analysis also revealed a sectoral gap. There are solid studies on human factors in Picking and numerous studies on burnout in other occupations, but few studies measure Simultaneously considering WMS, psychosocial workload, emotional intelligence, and turnover in work centers distribution. This absence prevents estimating effect size and identifying which technologies or

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Operating profiles present a higher risk. The model proposed below should be understood as
A well-founded operational hypothesis, subject to validation by longitudinal studies in warehouses.

4.2 Multilevel prevention model

The first level is organizational and addresses the source of the demands. Before training workers, the company must examine productivity parameters, staffing levels,
Breaks, work schedules, rotation, ergonomics, maintenance, and handling exceptions. Goals need to be set. The WMS should reflect task families and variables that the operator does not control. It should record causes. interruption without automatic fault assignment. This layer follows the recommendation of
Prioritize interventions on working conditions and reduce the risk of using intelligence.
Emotional support as compensation for harmful design (WHO, 2022a; WHO; ILO, 2022).

Data governance belongs to the same level. Every indicator that affects evaluation.
It must have a known purpose, formula, source, period, and contestation process. Comparisons Individual public services should be avoided, especially when there is no adjustment for complexity. Health and well-being data cannot inform disciplinary decisions. A committee with
operations, human resources, health and safety, technology, and workers' representatives
can review algorithm changes, new devices and escalation alerts (EU-OSHA,
2022; EU-OSHA, 2024).

The second level is managerial. Supervisors need to learn how to interpret signals.
Human and systemic. Training should include fact-based feedback, active listening,
Regulation during incidents, prevention of humiliation, fair distribution and referral.
of cases. Leadership evaluation should incorporate quality, safety, climate and
Development, not just throughput. Otherwise, the incentive system itself induces...
The leader is pressuring the team even when recognizing the risk.

Start-of-shift meetings can serve as a preventative measure if they are
Brief and useful. In addition to volume and security, the leader informs about changes, expected bottlenecks, Available resources and scaling criteria. An aggregate energy check of
The team allows for adjusting allocation without requiring clinical exposure. Finally, the review of exceptions... It identifies patterns and separates process events from individual behaviors. This ritual expands Predictability is a relevant resource in dynamic systems.

The third level is collective and participatory. Experienced operators should test it.
Interfaces, routes, messages, and timelines before widespread deployment. Participation reveals
invisible demands in simulations, such as auditory discomfort, competition for space,

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Confusing sequence and lack of time to review. Improvement groups need to receive feedback.
Regarding accepted or rejected proposals. Symbolic participation, without influence, increases.
Frustration; participation with clear criteria improves confidence and design quality (EU-
OSHA, 2024; LORSON; FÜGENER; HÜBNER, 2023).

Peer support can accelerate learning without creating informal surveillance.
The tutor operator accompanies newcomers in critical situations, observes their interaction with the device, and...
It models exception communication. The function must have recognized time in the goal. If tutoring is
Added to the normal volume, the resource transforms into demand. The rotation of the paper
It distributes knowledge and reduces dependence on a few specialists.

The fourth level is the individual development of emotional intelligence. It is proposed...
A program with voluntary diagnosis, four short modules, and on-site practice. The modules
They encompass self-awareness and signs of fatigue; attentional regulation and recovery; communication.
Assertiveness and asking for help; operational empathy and conflict resolution. Each module utilizes
Warehouse case studies, simple language, and a commitment to action. The training does not collect data.
Clinical diagnosis and does not generate ranking (POWELL et al., 2024).

Micro-practices can be incorporated without turning a break into a productive obligation.
Before restarting after a malfunction, the operator checks breathing, tension, and focus; in the presence of
ambiguous instruction, uses confirmation protocol; in conflict, describes event, impact and
need; upon perceiving fatigue, it activates a defined channel. The usefulness lies in creating a response.
available under pressure. Practice needs to coexist with real breaks, as no technique of
Regulation replaces physiological recovery.

The fifth component is assistance and inclusion. Persistent signs, intense suffering, or
Functional impairment requires confidential access to occupational health and specialized services.
Leadership neither diagnoses nor demands a detailed report. Returning to work may involve
Temporary adjustment of goals, schedules, tasks, and exposure to stimuli, as assessed.
professional. Policy should combat stigma and protect career opportunities (WHO,
2022a; WHO; ILO, 2022).

These levels form a system. Redesign reduces demands; leadership and participation.
Resources increase; training improves the ability to perceive and mobilize those resources;
Assistance addresses existing needs. Isolated interventions tend to displace the problem.
A wellness app without goal review individualizes; a goal review without
Communication can generate insecurity; leadership training without a change in incentives is ineffective.
Strength. Consistency between layers is the main quality criterion.

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Implementation can occur in 90-day cycles. During diagnosis, mapping is performed. Indicators and focus groups. In the design phase, a pilot area is chosen and parameters are reviewed. In the implementation phase, leaders and operators are trained, changes are implemented, and channels are ensured. support. In the evaluation, previous and subsequent trends are compared, preserving anonymity. Expansion depends on evidence of joint improvement in health, safety, Quality and stability, not just speed.

Management should set usage limits. Emotional intelligence will not be a criterion. Elimination process, promotion, or punishment; reports will not contribute to individual productivity; And aggregated results will serve to improve the work. This statement reduces suspicion and reinforces The principle is that emotions are not flaws to be corrected. The goal is to broaden ability to act on real risks.

4.3 Monitoring indicators and decision criteria

The assessment needs to integrate leading and following indicators. Turnover and Detachments are delayed; therefore, the panel should include perceived autonomy, clarity, support, Load, recovery, and system reliability. Operational indicators help to identify root causes. But they don't replace listening. The combination avoids interpreting every drop in productivity as emotional problem or all suffering as an expression of individual fragility.

Dimension	Suggested indicators	Management question	Preventive response
Demands	Time pressure, overtime, suppressed breaks, hourly exceptions	Does the goal take complexity and variability into account?	Recalibrate parameters, frame, and pauses.
Resources	Autonomy, leader support, clarity, training, right to challenge	Can the worker take action on the problem?	Increase participation, support, and explainability.
Health and well-being	Exhaustion, recovery, sleep, self-reported suffering, absences	Is there a concentrated worsening by area or shift?	Contact occupational health and safety and review the work.
Retention	Intention to leave, transfers, turnover, length of service.	Do exits follow an avoidable pattern?	Conduct retention conversations and correct causes.
Safe operation	Errors, rework, incidents, blockages, and downtime.	Does increased speed compromise quality or safety?	Suspend expansion and redesign the pilot program.

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Dimension	Suggested indicators	Management question	Preventive response
Learning	Self-efficacy, requests for help, adaptation time, implemented suggestions	The training is converts to behavior?	Strengthen situated practice and protected mentoring.

Table 2 – Preventive panel for WMS operations and automated picking Source: own elaboration (2026).

Data collection should establish a baseline prior to the change and observe the trend, not... an isolated point. Comparisons need to consider seasonality, mix, hours worked and Learning phase. Validated short scales can be applied at reasonable intervals. with aggregated results. Questions that are too frequent lead to research fatigue; Unanswered questions destroy trust. Each cycle should end with communication of what... This was observed, and what will be changed.

Stopping criteria are as important as success goals. The company must Interrupt or revise the deployment if incidents, burnout, or suppression of breaks increase. or output intent, even if throughput improves. This principle protects against optimization. Local: saving seconds in picking doesn't compensate for absenteeism, rework, accidents, or loss of experience. The decision should consider sustainable performance per shift and per period, not just short-term peak (KOREIS; LOSKE; KLUMPP, 2025; EU-OSHA, 2024).

Equity analysis verifies whether technology and goals affect newcomers differently. older workers, people with disabilities, or groups assigned to more demanding tasks. Requirement. Differences do not justify exclusion; they guide interface adaptation, training, and distribution. Experimental studies have limited samples and durations, so Actual implementation must monitor diversity of responses (PASPARAKIS; DE VRIES; DE KOSTER, 2023; LUCCHESE; PANAGOU; SGARBOSSA, 2025).

Emotional intelligence can be assessed by changes in behavior and climate. not through individual exposure of scores. Increased requests for help early on may This represents an improvement, as previously hidden problems become visible. Immediate reduction of Simply having records doesn't necessarily guarantee success. Interpretation must bring together data and narratives to... To distinguish effective prevention from defensive silence.

The economic return can be estimated by avoided replacement costs, hours. Overtime, rework, incidents, and absences, but the justification isn't limited to finances. Health. Mental health and decent work are ethical and managerial obligations. The economic argument should support this.

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continuity, without transforming suffering into value only when it affects productivity.
(WHO; ILO, 2022).

4.4 Research limits and agenda

The main limitation is the scarcity of studies that measure burnout and intelligence.
Emotional relationships directly affect WMS workers and automated picking. Part of the relationships
It was constructed through theoretical transfer of health and other occupations. This choice is justifiable.
It is useful for formulating hypotheses, but it does not allow for calculating prevalence or stating that the effects
The same results observed in nurses or psychologists will have the same magnitude in logistics operators.

Picking studies offer more situated evidence, but many still use
laboratory, small samples or short exposure. Initial satisfaction may reflect novelty,
while fatigue and monotony require prolonged monitoring. Field studies should
combine before-and-after measurements, comparison group when feasible, and follow-up that
go through normal periods and peak demand (CHONDROMATIDIS et al., 2024;
PASPARAKIS; OF VRIES; DE KOSTER, 2023; LUCCHESE; PANAGOU; SGARBOSSA,
2025).

Future research could test a model in which technological configuration and management
Algorithmic factors affect perceived demands; emotional intelligence, autonomy, and support play a role.
as resources; burnout mediates the intention to leave; and organizational justice moderates the
process. Multilevel data would allow separating individual characteristics from differences between
Teams, leaders, and units. Measuring actual turnover, in addition to intention, would strengthen...
validity.

It is also necessary to compare technologies without reducing the analysis to brands or
devices. The object should be a combination of interface, task content, rhythm, margin
decision-making and managerial use of data. The same tool can produce different results in
Different configurations. Participatory research, with operators involved in problem definition.
and interpretation of the findings would increase their practical relevance.

Finally, emotional intelligence interventions should be evaluated against changes.
Organizational and combined models. If individual training alone improves little,
While redesign and leadership produce greater effects, the organization will have evidence to...
allocate resources appropriately. The outcome needs to include health, safety, quality and
retention, avoiding studies that classify increased pressure tolerance as well-being.

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5. Final Considerations

The analysis suggests that emotional intelligence can contribute to prevention.
mental illness and turnover in WMS and automated picking operations when
integrated into the job design. It promotes signal recognition, regulation under
Pressure, communicating exceptions, peer support, and fairer leadership. These capabilities
They help to interrupt the silent passage of tension into exhaustion, detachment, and...
intention to leave.

The concept of Burnout 4.0 has proven useful in naming a combination
contemporary demands: digital pace, continuous monitoring, dependence on systems,
Lifelong learning, interaction with robots, and reduced autonomy. The term does not create...
diagnosis, but shifts the individual's attention to the relationship between technological architecture and
Organization. WMS and automation do not have an inevitable effect; they can reduce workload and improve
satisfaction or intensified control and suffering.

The main conclusion is that emotional intelligence should not be used as a technology.
Adapting to precariousness. Asking for self-control without correcting goals, pauses, and scope.
It transfers responsibility. A consistent strategy begins with organizational prevention.
Transparent data governance and operator participation. Leadership, development
Emotional support and specialized assistance broaden this base.

The proposed multilevel model offers practical application through diagnosis, pilot,
Evaluation and expansion are conditional. Its indicators balance demands, resources, health,
Retention, safe operation, and learning. The presence of stopping criteria prevents...
Gains in speed mask human deterioration. Thus, efficiency becomes the focus of evaluation.
due to the ability to sustain healthy performance over time.

Since direct evidence from the sector is still limited, the model requires validation in research centers.
distribution with different levels of automation. Longitudinal studies could verify this.
causal relationships and adjusting interventions to shifts, technologies, and task profiles. Still, the
Sources converge on a sufficient basis for responsible action: technology centered on
human being, developed emotional resources with protection and working conditions that
make it possible to remain healthy.

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