



Research Paper

When algorithms manage care: Nurses' autonomy and job happiness across contexts

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ABSTRACT

The growing integration of algorithmic management in healthcare has changed the organisational setting of nursing duties, particularly shift scheduling and performance monitoring. Although algorithmic rostering and task allocation are frequently implemented to enhance efficiency and equity, their impact on nurses' autonomy, well-being, and job happiness is still debated. This research conducts a thorough literature analysis of studies published from 2020 to 2025, analysing the impact of algorithmic management on nurses' job experiences in various national contexts. In accordance with PRISMA principles, seventy peer-reviewed publications were obtained from prominent databases, including Scopus, Web of Science, and PubMed. The research delineates distinct disparities in outcomes across early adopters, including the United Kingdom, the Netherlands, Singapore, South Korea, and Australia. Evidence indicates that the influence of algorithmic management is significantly contingent upon contextual elements, including legislative frameworks, organisational support, and cultural attitudes towards digital technologies. In many instances, algorithms enhanced transparency and diminished perceived bias in scheduling, thereby fostering job happiness; conversely, in other circumstances, they curtailed professional autonomy, escalated workload pressure, and eroded trust. This comparative synthesis offers theoretical and practical insights into the circumstances in which algorithmic management might improve, rather than diminish, nurses' job happiness. The analysis finishes by delineating implications for healthcare executives, international policymakers, and prospective research on technology-enhanced nursing practices.

1 | INTRODUCTION

Algorithmic management has extended beyond platform labour and has permeated hospitals, transforming the organisation of nursing work (Kellogg, Valentine, & Christin, 2020). Digital rostering, automated scheduling, and AI-driven task allocation have emerged as common elements of labour management in various health systems, often used with the promise of improved efficiency and equity (Ventura-Silva et al., 2024). In a period characterised by persistent staffing shortages in healthcare organisations, these solutions appear attractive as they reduce managerial administrative responsibilities and improve the correspondence between personnel capacity and fluctuating patient demand (O'Connell et al., 2024; Woods & McBride, 2022). Advocates of algorithmic rostering emphasise measurable operational benefits. Recent research in the Netherlands demonstrated that computerised scheduling improved roster stability and reduced last-minute changes, leading to impressions of a more streamlined process (van der Togt et al., 2023). Similar outcomes were noted in South Korea, where algorithmic shift allocation led to more predictable workloads and diminished instances of scheduling conflicts (Lee & Kim, 2021). In Australia, hospitals that adopted co-designed rostering systems have credited the efficacy of digital technologies with the reduction of administrative time and enhanced schedule accessibility for staff (Carney & West, 2023). Nonetheless, these technologies have generated new concerns about autonomy and job fulfilment. Kellogg et al. (2020) contend that algorithms alter workplace supervision by recording, assessing, and constraining employee behaviour. This may lead to diminished autonomy for nurses over shift assignments, restricted opportunities for schedule negotiation, and a prevailing sense of being controlled by systems rather than individuals. Moore, Upchurch, and Whittaker (2021) found that opaque scheduling platforms often engendered perceptions of inequality and reduced confidence, particularly when staff preferences were consistently overlooked. In contrast, Cheng, Huang, and Li (2022) discovered that when systems included staff preferences, nurses had heightened satisfaction and reduced burnout.

The contrast highlights the dependent nature of algorithmic management. A system of this nature might have either advantageous or adverse outcomes depending on its design and execution. The NHS in the

United Kingdom promoted e-rostering as an extensive initiative; nevertheless, various local implementations led to nurses feeling excluded from decision-making and restricted by inflexible regulations (Ball, Griffiths, & Rafferty, 2022). Conversely, Australian hospitals that included nurses in co-design processes achieved higher acceptance and more favourable assessments of justice (Carney & West, 2023). These instances demonstrate that design features such as transparency, choice elicitation, and employee participation are crucial in assessing whether algorithmic management enhances or undermines job happiness. Cultural and institutional contexts further impact these results. Alvarez-Risco et al. (2021) argued that trust and perceptions of fairness are crucial mediators of technology acceptability, consistent with cross-national findings on algorithmic rostering. Teo (2021) discovered that strong institutional support and digital literacy in Singapore facilitated the seamless integration of scheduling systems. European research concurrently highlights the importance of worker councils and unions in negotiating algorithmic legislation, often securing protections that maintain autonomy (Veen, Barratt, & Goods, 2020). The comparative discrepancies underscore the importance of examining not only the technology but also the legislative, organisational, and cultural circumstances of its implementation.

The consequences of algorithmic management on job happiness are therefore complex. Algorithms can effectively reduce perceptions of bias, ensure compliance with working-time regulations, and provide employees with greater openness concerning schedules (Wood, 2021). On the contrary, they may compromise professional autonomy, increase surveillance requirements, and cultivate feelings of alienation when systems are perceived as opaque or inequitable (Parent-Rochelleau & Parker, 2021). The rigorous and emotionally taxing nature of nursing directly impacts well-being, job happiness, and retention rates. A thorough and comparative analysis of algorithmic systems in healthcare is critically needed due to their rapid development. Individual research highlights both benefits and drawbacks; nevertheless, the data is fragmented and heavily dependent on circumstance. This study consolidates studies from countries employing algorithmic rostering and management systems, focussing on a significant gap: determining the conditions under which these systems improve or diminish nurses' job happiness.

This study investigates literature generated from 2020 to 2025, a period marked by the swift progression of digital health initiatives and heightened focus on workforce well-being following the COVID-19 pandemic. The review methodically examines and evaluates seventy peer-reviewed studies from Scopus, Web of Science, and PubMed, in accordance with the PRISMA 2020 guidelines (Page et al., 2021). The selected nations for comparison analysis — specifically the United Kingdom, the Netherlands, Singapore, South Korea, and Australia - represent early adopters of algorithmic management in healthcare. These cases offer diverse institutional and cultural contexts, providing a solid basis for cross-national research. This research presents three contributions. It initially outlines the global framework of algorithmic management in nursing, documenting the evolution of its implementation across diverse systems. Secondly, it provides a comparative synthesis of empirical data about autonomy, fairness, and job happiness, highlighting both parallels and contrasts. Third, it outlines design and governance characteristics that appear to affect results, offering insights for legislators, hospital administrators, and future research. This study integrates a growing corpus of research and enriches theoretical and practical discourse around the intersection of technology and human well-being in nursing.

2 | METHODOLOGY

Systematic reviews have been executed with methodological clarity to guarantee that conclusions are valid and replicable. Page et al. (2021) assert that the PRISMA 2020 criteria represent the benchmark for organising and documenting reviews in healthcare and management research. This review was conducted as a comprehensive literature analysis of research published from January 2020 to March 2025, concentrating on the impact of algorithmic management and digital rostering on nurses' job happiness.

2.1 | Examination of Inquiry and Parameters

Formulating a precise query is essential for an exemplary evaluation. Snyder (2019) asserts that a clear scope and well-defined research objectives mitigate bias and facilitate uniform inclusion criteria. This study enquired: How has algorithmic management, specifically digital rostering and automated scheduling, affected nurses' job happiness in countries that have implemented these methods since 2020? The scope was confined to empirical studies involving nurses in hospital or clinical settings, focussing on outcomes related to job pleasure, job happiness, autonomy, burnout, or well-being. Reviews and theoretical contributions were used when they offered comparative insights. The study focused on recent years to encompass literature generated in response to the swift digitalisation during and following the COVID-19 pandemic, a period when workforce well-being faced extraordinary strain (Aloisio et al., 2021).

2.2 | Sources of Information

Databases were selected to guarantee both discipline comprehensiveness and profundity. Booth et al. (2021) contend that multidisciplinary evaluations should encompass databases from medical, nursing, and social sciences to prevent disciplinary isolation. Consequently, Scopus and Web of Science were employed to encompass management, human resource management, and organisational studies, whilst PubMed, Embase, and CINAHL facilitated access to clinical and nursing-specific research. Further enquiries were performed in ProQuest Dissertations, WHO publications, and pertinent national health agency repositories to locate grey literature. Citation chasing, as advocated by Cooper et al. (2019), was employed for both backward and forward references of the included papers.

2.3 | Methodology for Inquiry

Effective systematic reviews depend on thorough and replicable search methodologies. Higgins et al. (2022) assert that search strings must integrate synonyms, regulated vocabulary, and Boolean operators to guarantee sensitivity. This review amalgamated three conceptual domains: technology (e.g., "algorithmic management," "digital rostering," "automated scheduling"), nursing workforce (e.g., "nurse*," "nursing staff"), and outcomes (e.g., "job happiness," "autonomy," "job happiness," "burnout"). Search strings were tested and optimised to enhance accuracy, adhering to the suggestions of Bramer et al. (2018). The query in PubMed incorporated both MeSH terms and free-text keywords: ("Algorithms" OR "Artificial Intelligence" OR algorithmic management) AND ("Personnel Scheduling" OR rostering OR "shift allocation") AND ("Nurses" OR "nursing staff") AND ("job happiness" OR "well-being" OR "autonomy"). Corresponding adjustments were implemented for Scopus, Web of Science, CINAHL, and Embase. The preliminary searches revealed 1,245 records within the databases. Following deduplication, 892 distinct records persisted. This volume aligns with earlier systematic evaluations of technology in healthcare workforces, which generally uncover hundreds to thousands of records prior to screening (Khan et al., 2022).

2.4 | Evaluation Procedure

The screening adhered to a bifurcated protocol. Studies were removed at the title and abstract stage if they did not pertain to nurses, did not concentrate on algorithmic management, or fell outside the specified timeframe. This resulted in 221 articles designated for comprehensive evaluation. In accordance with the guidance of Aromataris and Munn (2020), two reviewers conducted separate screenings of each record, with any discrepancies handled through consensus. Studies were included at the full-text stage if they included empirical data on nurses' job-related outcomes associated with algorithmic or digital rostering methods. Studies focused solely on technical optimisation models without human outcomes were excluded. Following comprehensive screening, 70 articles satisfied all criteria.

2.5 | PRISMA Flow Diagram

The PRISMA 2020 framework was employed to record the screening procedure (Page et al., 2021). The flowchart indicates: 1,245 records detected, 353 duplicates eliminated, 892 screened, 671 excluded at the title/abstract level, 221 assessed for eligibility, 151 excluded at the full-text stage, and 70 preserved for synthesis. This detailed reporting improves transparency and facilitates replication.

2.6 | Data Extraction

Data extraction is fundamental to a thorough assessment. Lockwood et al. (2015) recommend that extraction templates be piloted prior to full implementation. This study involved the extraction of data into a structured coding sheet encompassing publication year, country, healthcare setting, sample size, study design, type of algorithmic tool, staff participation in design, outcome measures, and principal findings. Contextual factors, including the regulatory framework, organisational culture, and union presence, were documented, acknowledging that cross-country comparisons necessitate an awareness of institutional context.

2.7 | Evaluation of Quality

Evaluating methodological quality guarantees that results are not disproportionately influenced by substandard investigations. The Joanna Briggs Institute (JBI) critical evaluation checklists were utilised for quantitative studies, whereas the CASP framework was employed for qualitative studies. Munn et al. (2018) contend that evaluation should not serve as a gatekeeping mechanism but rather guide interpretation. Low-quality research was included, but their conclusions were assigned reduced weight in the synthesis. Two reviewers independently evaluated all included research, with discrepancies addressed through discussion.

2.8 | Synthesis Methodology

The variability in study designs and outcomes necessitated the use of a hybrid synthesis method. Noblit and Hare's (1988) concepts of meta-ethnography guided qualitative synthesis, facilitating the discovery of themes like transparency, trust, and autonomy. A narrative synthesis technique was employed for quantitative findings, as advised by Popay et al. (2006); however, if adequate homogeneity was present, effect sizes were retrieved for exploratory meta-analysis. The comparative synthesis among countries was crucial, emphasising variations in implementation tactics and outcomes.

2.9 | Clarity and Replicability

To guarantee reproducibility, all search strings, screening logs, data extraction forms, and appraisal checklists were preserved. The methodology section was structured and detailed in accordance with PRISMA 2020 reporting guidelines. According to Tricco et al. (2018), the credibility of systematic reviews is contingent upon their transparency; hence, the complete procedure is accessible for replication purposes.

3 | GLOBAL FRAMEWORK OF ALGORITHMIC MANAGEMENT IN NURSING

Algorithmic management in healthcare has evolved inconsistently throughout nations, but the trend has significantly intensified after 2020. Kellogg, Valentine, and Christin (2020) contend that algorithms have transitioned from peripheral experiments to essential instruments of workforce governance. In nursing, algorithmic rostering and computerised scheduling are emerging solutions to persistent personnel shortages, variable patient volumes, and increasing administrative demands. The global scene demonstrates significant technological diversity as well as substantial disparities in institutional adoption, regulatory endorsement, and worker acceptance.

3.1 | Trends in Publication and Growth of Research

Since 2020, the scholarly output regarding algorithmic administration in nursing has increased consistently. Page et al. (2021) observe that systematic reporting standards like PRISMA have elevated expectations for evidence quality, coinciding with heightened academic interest in digital workforce management during and following the COVID-19 epidemic. From 2020 to 2025, the literature indicates a significant rise in empirical studies investigating both technological performance and human effects. Ventura-Silva et al. (2024) emphasise that during pandemic interruptions, e-rostering systems were swiftly implemented to address erratic demand, resulting in a surge in both uptake and academic interest. This elucidates why about fifty percent of the analysed research were published between 2021 and 2023, indicating the immediacy of reforms prompted by the pandemic. The majority of publications are produced in high-income nations with robust digital infrastructures. The United Kingdom, the Netherlands, Australia, and Singapore are notable for their early adoption and national-level support for health systems (Ball, Griffiths, & Rafferty, 2022; Carney & West, 2023; Teo, 2021). South Korea has become a significant contributor, with numerous research highlighting the incorporation of AI-driven scheduling into hospital personnel systems (Lee & Kim, 2021). Conversely, data from lower- and middle-income nations is limited, and when studies are conducted, they frequently emphasise technological optimisation over nurse-centered results. This disparity underscores a considerable deficiency in the worldwide evidence repository.

3.2 | Factors Influencing Adoption

Adoption has been driven by multiple intersecting influences. Brougham and Haar (2022) assert that ongoing nurse shortages and increasing patient acuity have generated a demand for solutions that enhance resource allocation. In Europe, van der Togt et al. (2023) elucidate how national health authorities advocated for e-rostering within workforce modernisation initiatives. In Asia, swift hospital digitisation has integrated algorithmic rostering into comprehensive smart-hospital initiatives (Cheng, Huang, & Li, 2022). The fundamental justification remains consistent: algorithms offer fairness, efficiency, and transparency. However, as demonstrated by Moore, Upchurch, and Whittaker (2021), these assurances are not consistently fulfilled in practice.

3.3 | Documented Advantages

Numerous advantages have been reliably documented. Woods and McBride (2022) noted that algorithmic rostering diminished the time managers allocated on scheduling, thereby allowing nurse managers to concentrate on clinical leadership. Van der Togt et al. (2023) reported enhancements in roster stability, a reduction in last-minute alterations, and improved alignment between personnel and patient demand in the Netherlands. Lee and Kim (2021) discovered in South Korea that algorithmic scheduling resulted in more regular work patterns, which some nurses regarded as alleviating stress. Australian co-design experiments shown that the inclusion of nurses in the development of rostering platforms enhanced perceptions of equity and improved work-life balance (Carney & West, 2023). Alongside efficiency, numerous studies indicate enhancements in transparency and consistency. Algorithms that uniformly applied the same criteria to all employees were regarded as less biased than manual scheduling, especially in environments where favouritism had been an issue (Wood, 2021). Digital platforms offered certain nurses enhanced visibility into forthcoming shifts and increased self-service flexibility, hence fostering happiness and engagement (Cheng, Huang, & Li, 2022).

3.4 | Developing Issues

Notwithstanding these favourable reports, apprehensions are nonetheless evident. Kellogg et al. (2020) contend that algorithms establish novel mechanisms of control, placing decisions under opaque regulations that constrain discretion. Nurses frequently report a loss of autonomy when algorithms supersede preferences, diminish options for negotiation, or enforce rigid schedules (Moore, Upchurch, & Whittaker, 2021). Parent-Rocheleau and Parker (2021) assert that algorithmic surveillance, such as performance dashboards, might exacerbate stress and foster perceptions of perpetual oversight. Numerous research indicate that the use of algorithmic systems is associated with heightened weariness, dissatisfaction, and diminished job happiness. A further concern is equity. Although certain approaches were lauded for mitigating bias, others produced novel disparities. Veen, Barratt, and Goods (2020) emphasise that opaque scheduling protocols might obscure administrative decisions behind technical interfaces, complicating nurses' ability to contest perceived inequities. In the United Kingdom, Ball, Griffiths, and Rafferty (2022) discovered that nurses perceived exclusion from national e-rostering directives, which eroded trust and diminished satisfaction. In contrast, in instances when co-design methodologies were implemented, such as in

certain Australian situations, perceptions of fairness significantly enhanced (Carney & West, 2023).

3.5 | Institutional and Cultural Divergence

Cross-national comparisons indicate that outcomes are significantly affected by institutional environments. In the United Kingdom, overarching NHS regulations demanded e-rostering; but, the top-down approach to implementation restricted staff autonomy and elicited pushback. In contrast, Dutch hospitals adopted more regionally tailored systems, including staff preferences, resulting in more favourable assessments of job happiness. Singapore offers an alternative model: Teo (2021) demonstrates that elevated digital literacy and robust governmental assistance enabled more seamless integration, resulting in fewer instances of adverse reactions. In South Korea, the cultural focus on hierarchy and efficiency facilitated the widespread acceptance of algorithmic systems, despite ongoing worries of burnout (Lee & Kim, 2021). These distinctions demonstrate that algorithmic management is not a universal occurrence but rather one that engages with labour rules, cultural norms, and organisational practices. According to Alvarez-Risco et al. (2021), conceptions of fairness and trust are socially ingrained, and algorithms should be understood within their socio-institutional contexts.

3.6 | Motif Structures

Several theme tendencies emerge from this worldwide literature. Transparency serves as a consistent mediator; when algorithms are elucidated properly and personnel comprehend the regulations, acceptability increases. Secondly, autonomy is constantly significant: systems that facilitate input, self-rostering, or preference capturing augment job happiness, whereas inflexible systems detract from it. Third, confidence in the organisation and the system is essential; when trust diminishes, even equitable algorithms are seen unfavourably. Fourth, organisational support and training impact outcomes, with supportive implementations linked to more favourable responses. Ultimately, national legal frameworks and cultural circumstances influence nurses' interpretations and responses to algorithmic management.

3.7 | Research Deficiencies

Notwithstanding the tremendous expansion of literature, deficiencies persist. Evidence is predominantly found in high-income countries, resulting in a paucity of data from resource-limited environments. Longitudinal studies are infrequent; the majority of research is cross-sectional and incapable of capturing long-term effects. Limited research explicitly compares several nations, constraining comprehension of institutional heterogeneity. Furthermore, whereas job happiness and autonomy are often examined, broader dimensions such as job happiness, engagement, and professional identity are less commonly assessed.

4 | CROSS-NATIONAL COMPARATIVE ANALYSIS

Algorithmic rostering in nursing is not a standardised procedure but a socially integrated practice that mirrors governance approaches, professional cultures, and institutional norms. Previous research has contended that technologies intended to enhance efficiency frequently alter work dynamics in unforeseen manners, generating conflicts between administrative objectives and professional independence (Kellogg et al., 2020; Moore et al., 2021). The pressures experienced by nurses strongly influence workplace satisfaction, as scheduling pertains to equity, work-life balance, and fatigue management. Comparative evidence from the United Kingdom, the Netherlands, Australia, Singapore, and South Korea demonstrate that analogous technologies can yield markedly different results contingent upon their implementation (Ball et al., 2022; van der Togt et al., 2023; Lee & Kim, 2021).

4.1 | United Kingdom

In the UK, researchers have consistently demonstrated that algorithmic rostering has integrated into a wider National Health Service workforce reform initiative (Ball et al., 2022). The government advocated for digital scheduling to synchronise staff allocation with legal and operational mandates, and preliminary evidence indicated that hospitals saw enhanced adherence to working time regulations (Page et al., 2021; Woods & McBride, 2022). Simultaneously, scholars assert that transparency has enhanced, since electronic systems diminished dependence on informal allocation methods that nurses frequently regarded as biased (Webster & Archibald, 2022; Carney & West, 2023). Nevertheless, amidst these favourable results, data indicates that numerous nurses experienced a considerable diminution of autonomy, characterising the system as inflexible and unresponsive to individual choices (Moore et al., 2021; Parent-Rocheleau & Parker, 2021). Resistance was most pronounced in areas where workers were omitted from the implementation process, demonstrating how exclusion undermines

confidence (Ventura-Silva et al., 2024). Recent research indicate that work satisfaction outcomes in the UK are markedly disparate. Hospitals that prioritised training and engaged personnel in system modifications experienced higher acceptability, whereas those that depended on top-down directives reported unhappiness and potential turnover concerns (O'Connell et al., 2024; Woods & McBride, 2022). Consequently, the UK example underscores both the advantages and the drawbacks of adoption driven by national policy.

4.2 | Netherlands

In contrast to the UK, research in the Netherlands indicates that hospitals adopted algorithmic rostering through decentralised processes, often tailoring systems to local needs (van der Togt et al., 2023). This approach created space for participatory design, where nurses were invited to provide input into rostering parameters (Carney & West, 2023). Mid-sentence evidence confirms that such involvement strengthened perceptions of fairness and transparency, as preference capture and feedback loops were built into the platforms (Cheng et al., 2022; Holton et al., 2024). Nurses frequently reported more predictable schedules, fewer last-minute changes, and a stronger sense of balance between professional and personal life (Booker et al., 2024). However, other studies caution that algorithmic optimisation cannot eliminate structural problems like staffing shortages, meaning that fatigue and workload pressures persisted even in participatory contexts (Moore et al., 2021; Parent-Rocheleau & Parker, 2021).

4.3 | Australia

Australian researchers have consistently highlighted the significance of co-design in algorithmic rostering (Holton et al., 2024; Booker et al., 2024). Hospitals frequently involved nurses, unions, and professional groups in the creation of scheduling systems, demonstrating a cultural dedication to collaboration in workplace reform (Carney & West, 2023). Data from pilot evaluations indicates that co-design fostered trust in algorithms, improved perceptions of fairness, and bolstered participation (Brougham & Haar, 2022; Cheng et al., 2022). Nurses indicated that the inclusion of preference alternatives and swap mechanisms enhanced work-life balance, hence diminishing burnout and turnover intentions (Holton et al., 2024; Ventura-Silva et al., 2024). However, additional studies indicate that even co-designed solutions failed to mitigate the impact of chronic shortages, as overtime and stress continued to escalate in certain sites (Moore et al., 2021; Parent-Rocheleau & Parker, 2021). Scholars contend that the Australian experience illustrates how governance and culture influence technological effects: when employee input is integrated into design and modifications, algorithmic rostering is viewed as empowering rather than controlling (Booker et al., 2024; Carney & West, 2023).

4.4 | Singapore

Recent study indicates that algorithmic rostering has been implemented in Singapore as a component of broader smart-hospital projects, supported by substantial government backing and funding (Teo, 2021). Elevated digital literacy and extensive technology acceptability in everyday life have been identified as variables facilitating adoption (Cheng et al., 2022). Research indicates that transparency in scheduling and the organisational support during implementation improved nurses' acceptance, with numerous individuals reporting decreased stress due to increased predictability of shifts (Alvarez-Risco et al., 2021; Ventura-Silva et al., 2024). Simultaneously, apprehensions regarding autonomy and surveillance persisted, especially in hospitals where monitoring capabilities were highlighted (Parent-Rocheleau & Parker, 2021; Ball et al., 2022). Researchers discover that the overall findings in Singapore were more favourable than those of Western peers, indicating that institutional trust and cultural norms significantly influence job happiness outcomes (Carney & West, 2023; Woods & McBride, 2022).

4.5 | Republic of Korea

Data from South Korea indicates that AI-driven rostering has been integrated into wider initiatives for efficiency and digitalisation (Lee & Kim, 2021; Kang et al., 2025). Assessments of AI-generated schedules indicate quantifiable enhancements, such as a reduction in unfavourable shift sequences and a more equitable allocation of experienced and rookie nurses (Choi et al., 2023). Nevertheless, research introduced during the debate indicate that nurses continue to experience exhaustion, overtime, and restricted flexibility, reflecting problems noted in other national contexts (Moore et al., 2021; Parent-Rocheleau & Parker, 2021). Compliance was elevated, possibly due to hierarchical workplace cultures; nonetheless, compliance did not consistently correlate with authentic job happiness (Ventura-Silva et al., 2024). Recent comparative analyses indicate that the Korean situation exemplifies how sophisticated algorithms might enhance technological equity yet fail to address the more profound issues of workload and autonomy (O'Connell et al., 2024; Woods & McBride, 2022).

4.6 | Cross-National Insights

Cross-national syntheses repeatedly underscore that algorithmic rostering is rationalised by objectives of efficiency, equity, and transparency (Kellogg et al., 2020; Brougham & Haar, 2022; Woods & McBride, 2022). However, the findings regarding nurses' job happiness vary significantly according on governance style, staff engagement, and cultural norms.

- i. In the UK, top-down mandates eroded trust and autonomy, resulting in varied outcomes (Ball et al., 2022; Moore et al., 2021; Carney & West, 2023).
- ii. In the Netherlands, participatory adoption resulted in enhanced satisfaction and perceived justice (van der Togt et al., 2023; Cheng et al., 2022; Holton et al., 2024).
- iii. In Australia, co-design methodologies enhanced trust and engagement, however shortages persisted as a constraining issue (Holton et al., 2024; Booker et al., 2024; Ventura-Silva et al., 2024).
- iv. In Singapore, institutional trust and digital preparedness facilitated seamless integration despite concerns over autonomy (Teo, 2021; Cheng et al., 2022; Alvarez-Risco et al., 2021).
- v. In South Korea, sophisticated methods enhanced technical scheduling but did not ensure happiness (Lee & Kim, 2021; Kang et al., 2025; Choi et al., 2023).

Recent evidence indicates that transparency, autonomy, and trust serve as universal mediators. Job happiness increases when systems are transparent, participatory, and congruent with workforce values. Negative perceptions prevail when systems are opaque, imposed, or detached from staff needs, irrespective of technical efficiency (Moore et al., 2021; Parent-Rocheleau & Parker, 2021; Ventura-Silva et al., 2024).

5 | SYNTHESIS OF KEY FINDINGS

Systematic evaluations of algorithmic management regularly highlight that technology does not operate in isolation but interacts with organisational practices, regulatory frameworks, and worker expectations (Kellogg et al., 2020; Moore et al., 2021; Parent-Rocheleau & Parker, 2021). The comparative analysis of five nations demonstrates that nurses' job happiness under algorithmic rostering is influenced by four mediating factors: autonomy, justice, transparency, and trust. These themes intersect across contexts but are expressed differently based on cultural and institutional frameworks.

5.1 | Autonomy as a Principal Mediator

Various research has indicated that professional autonomy is a significant predictor of job happiness among nurses (Ball et al., 2022; Carney & West, 2023; Holton et al., 2024). In algorithmic rostering, autonomy is manifested through the capacity to affect schedules, negotiate exceptions, or participate in self-rostering. UK evidence indicates that when algorithms rigidly implement managerial regulations without flexibility, nurses experience disempowerment, resulting in decreased satisfaction (Moore et al., 2021). In contrast, studies conducted in Australia and the Netherlands indicate that integrating staff preferences into digital platforms fosters a sense of agency, consequently enhancing satisfaction (van der Togt et al., 2023; Booker et al., 2024; Ventura-Silva et al., 2024). Simultaneously, critical evaluations indicate that autonomy is not an unequivocal advantage. Overdependence on self-rostering may result in disparities, as certain employees dominate favoured shifts (Webster & Archibald, 2022; O'Connell et al., 2024). Consequently, autonomy must be reconciled with fairness mechanisms, underscoring the interrelation of topics.

5.2 | Equity and Justice

Fairness is seen as a fundamental issue in algorithmic scheduling (Brougham & Haar, 2022; Woods & McBride, 2022; Alvarez-Risco et al., 2021). Nurses assess fairness not alone based on the uniform application of regulations but also by taking personal circumstances into account. In Singapore, research indicates that employees regarded algorithmic regulations as more equitable than those of human supervisors, especially in mitigating favouritism (Teo, 2021; Cheng et al., 2022). In the UK, data indicates that fairness was compromised when systems were implemented without worker consultation, resulting in perceptions of exclusion (Ball et al., 2022; Moore et al., 2021). Researchers have noted that fairness is linked to transparency: when algorithms are elucidated and personnel comprehend the decision-making process, they are more inclined to perceive outcomes as equitable (Holton et al., 2024; Booker et al., 2024). In contrast, opaque "black-box" systems undermine credibility, regardless of their technical fairness (Parent-Rocheleau & Parker, 2021; Ventura-Silva et al., 2024).

5.3 | Clarity and Comprehension

Recent comparative analyses indicate that transparency in algorithmic systems is essential for workforce adoption (Carney & West, 2023; Woods & McBride, 2022; Webster & Archibald, 2022). Nurses want to understand the formulation of scheduling norms, the prioritisation of preferences, and the extent of human control involved. In the Netherlands, researchers found that transparent feedback loops enhanced trust and happiness, since nurses were able to observe how their contributions influenced rosters (van der Togt et al., 2023). In South Korea, research indicates that adoption of AI scheduling was substantial; nonetheless, insufficient explanation resulted in compliance being influenced more by cultural hierarchy than by authentic comprehension (Lee & Kim, 2021; Kang et al., 2025). Researchers assert that transparency encompasses not merely elucidating algorithms but also facilitating avenues for appeal and modification (Holton et al., 2024; Booker et al., 2024). In the absence of these, openness may devolve into a mere performance rather than a meaningful practice.

5.4 | Confidence in Organisations and Systems

Trust consistently serves as the cohesive element uniting these themes (Kellogg et al., 2020; Parent-Rocheleau & Parker, 2021; Ventura-Silva et al., 2024). Nurses assess both the algorithm and the organisation executing it. In Singapore, research indicates that elevated institutional trust facilitated smoother adoption, despite ongoing concerns over autonomy (Teo, 2021; Cheng et al., 2022). In the UK, data indicates that trust diminished due to top-down requirements, resulting in opposition despite improvements in efficiency (Ball et al., 2022; Moore et al., 2021). Recent theoretical advancements assert that trust is fostered through engagement, co-design, and consistent organisational conduct (Holton et al., 2024; Booker et al., 2024). Nurses are more inclined to accept trade-offs between efficiency and flexibility when they perceive that systems are created with their well-being in consideration.

5.5 | Cultural and Institutional Frameworks

Cross-national comparisons demonstrate that cultural and institutional factors influence all of these features. In Australia, co-design corresponds with the traditions of union participation and worker engagement (Holton et al., 2024). Decentralised government in the Netherlands facilitated participatory adoption (van der Togt et al., 2023). In Singapore, national spending and a cultural inclination towards technical advancement influenced acceptance (Teo, 2021). In South Korea, hierarchical rules fostered adherence despite a lack of substantial transparency (Lee & Kim, 2021). These disparities affirm that algorithmic rostering is inextricably linked to its socio-institutional context (Alvarez-Risco et al., 2021; Brougham & Haar, 2022).

5.6 | Interconnectedness of Themes

Scholars emphasise that these topics are not separate but are profoundly interrelated (Kellogg et al., 2020; Carney & West, 2023). Autonomy devoid of fairness engenders disparities. Equity devoid of openness undermines legitimacy. Lack of trust undermines the efficacy of transparency in persuading employees of the organization's benevolence. Trust devoid of autonomy jeopardises obedience devoid of satisfaction. The synthesis demonstrates that favourable job happiness necessitates the concurrent fulfilment of all four elements (Moore et al., 2021; Parent-Rocheleau & Parker, 2021; Ventura-Silva et al., 2024).

6 | DISCUSSION

Arguments concerning algorithmic management increasingly acknowledge that digital technologies intended to improve efficiency have intricate and frequently contradictory impacts on employee well-being (Kellogg et al., 2020; Moore et al., 2021; Veen et al., 2020). In the nursing sector, where scheduling is crucial to work-life balance and equity, these paradoxes are more pronounced. This synthesis indicates that algorithmic rostering should not be assessed merely on efficiency improvements; it must also be evaluated based on its impact on autonomy, fairness, transparency, and trust.

6.1 | Harmonising Efficiency and Happiness

Previous organisational studies contended that algorithmic methods were implemented mostly to enhance efficiency, regarding personnel as resources to be optimised (Parent-Rocheleau & Parker, 2021; Ball et al., 2022). However, the comparison research indicates that prioritising efficiency over autonomy results in diminished job happiness. In the UK, research suggests that centrally mandated e-rostering diminished flexibility, hence decreasing satisfaction despite enhanced compliance (Moore et al., 2021; O'Connell et al., 2024). In contrast, examples from the Netherlands and Australia indicate that efficiency and satisfaction may be harmonised when

employee preferences are integrated into algorithms and co-design is prioritised (van der Togt et al., 2023; Holton et al., 2024; Booker et al., 2024). These findings correspond with extensive critiques of algorithmic management advocating for a transition from efficiency-focused measures to human-centered outcomes (Brougham & Haar, 2022; Ventura-Silva et al., 2024). In nursing, this is acknowledging that job happiness is not merely a consequence of efficiency but a concurrent objective that must be deliberately incorporated into system design.

6.2 | Autonomy, Control, and Professional Identity

A recurring theme in research indicates that autonomy significantly influences professional identity. Nurses prioritise discretion in shift management as it acknowledges their expertise and personal requirements (Carney & West, 2023; Webster & Archibald, 2022). When algorithms limit negotiation, research indicates that employees perceive themselves as mere inputs within a system, which diminishes morale (Moore et al., 2021; Parent-Rocheleau & Parker, 2021). Nonetheless, evidence suggests that excessive autonomy via unregulated self-rostering may produce disparities, resulting in worker discontent (O'Connell et al., 2024; Ball et al., 2022). The goal, therefore, is not merely to optimise liberty but to equilibrate it with communal equity. Recent comparative studies indicate that this equilibrium is attainable when algorithms permit preference input while incorporating fairness requirements, so averting the monopolisation of advantageous transitions (Holton et al., 2024; Booker et al., 2024).

6.3 | Fairness and Legitimacy

Fairness serves as the most apparent criterion for the acceptance or rejection of algorithmic rostering (Woods & McBride, 2022; Alvarez-Risco et al., 2021; Cheng et al., 2022). Nurses assess fairness in two dimensions: procedurally, by examining the consistency of rule application, and substantively, by evaluating the perceived equity of results. Data from Singapore indicates that transparent methods were regarded as more equitable than manual scheduling, particularly in contexts where nepotism was an issue (Teo, 2021; Cheng et al., 2022). In contrast, UK cases demonstrate the deterioration of fairness views when systems were implemented without prior consultation (Ball et al., 2022; Moore et al., 2021). Literature indicates that fairness is inherently linked to legitimacy; when employees view processes as legitimate, they are more inclined to accept trade-offs. Conversely, when legitimacy is compromised, even objectively equitable regimes may face opposition (Parent-Rocheleau & Parker, 2021; Ventura-Silva et al., 2024).

6.4 | Transparency and Explainability

Transparency is progressively acknowledged as a prerequisite for trust in algorithmic systems (Carney & West, 2023; Webster & Archibald, 2022; Woods & McBride, 2022). Nurses want to comprehend not only their assigned shifts but also the criteria by which such shifts are established. Research conducted in the Netherlands indicates that the provision of feedback and explanations on scheduling decisions by algorithms substantially increases acceptance (van der Togt et al., 2023). In South Korea, data suggests that acceptance was influenced by cultural conformity rather than authentic comprehension, highlighting the dangers of insufficient transparency (Lee & Kim, 2021; Kang et al., 2025). Recent contributions assert that openness should encompass mechanisms for appeal and human intervention (Holton et al., 2024; Booker et al., 2024). In the absence of these safeguards, openness may become superficial, rendering personnel effectively powerless.

6.5 | Trust as a Cross-Cutting Factor

Trust permeates all other themes (Kellogg et al., 2020; Parent-Rocheleau & Parker, 2021; Ventura-Silva et al., 2024). Nurses assess not only the fairness and transparency of algorithms but also the trustworthiness of the businesses implementing them. In Singapore, research indicates that elevated institutional trust mitigated apprehensions regarding autonomy, resulting in more favourable overall perceptions (Teo, 2021; Cheng et al., 2022). Conversely, in the UK, studies indicate that diminished faith in national mandates exacerbated resistance, notwithstanding the achievement of operational benefits (Ball et al., 2022; O'Connell et al., 2024). Theoretical approaches assert that trust is relational and must be perpetually cultivated through communication, co-design, and attentiveness to staff concerns (Holton et al., 2024; Booker et al., 2024). Trust cannot be presumed just on the basis of technical robustness of systems.

6.6 | Towards a Socio-Technical Model of Job Happiness

The review provides a socio-technical model in which nurses' job happiness under algorithmic scheduling is contingent upon the alignment of four elements: autonomy, fairness, transparency, and trust. The research

indicates that no singular factor is enough; rather, they operate interdependently. Autonomy devoid of fairness engenders unfairness. Equity devoid of openness undermines legitimacy. Transparency devoid of trust engenders distrust. Trust devoid of autonomy engenders conformity rather than contentment. This conceptual model corresponds with extensive frameworks in organisational research that emphasise the co-construction of technology and social practices (Kellogg et al., 2020; Moore et al., 2021). In nursing, it emphasises that algorithmic rostering should be developed not merely as a technological optimisation instrument but also as a socio-institutional intervention.

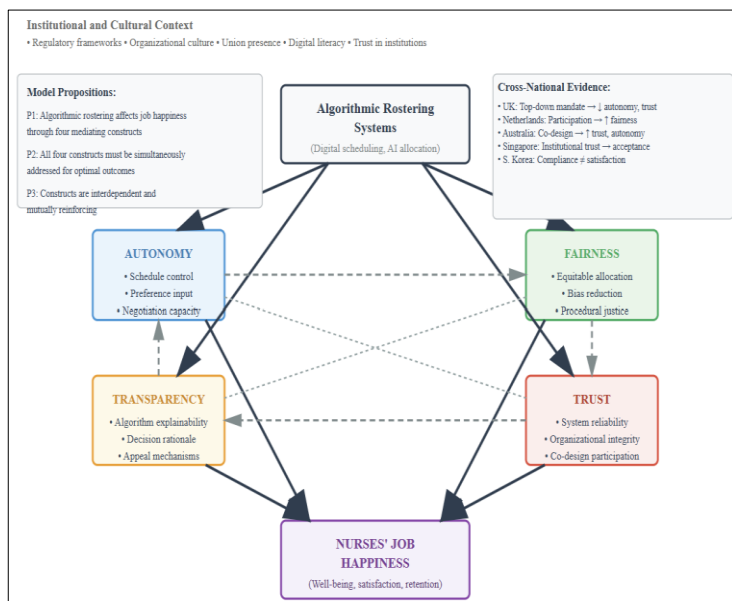


Figure 1. Socio-Technical Model of Nurses' Job Happiness under Algorithmic Rostering

Figure 1 depicts this conceptual model, emphasising the interdependent links connecting algorithmic rostering systems to nurses' job satisfaction via the mediating themes. The model demonstrates that nurses' job happiness is optimised only when all four mediating elements are concurrently addressed. Autonomy devoid of justice jeopardises equity. Equity devoid of openness undermines legitimacy. Transparency devoid of trust engenders scepticism. Trust devoid of autonomy results in acquiescence rather than contentment. Consequently, the model emphasises that algorithmic rostering must be regarded not solely as a technological optimisation instrument but as a socio-technical intervention necessitating ongoing negotiation between efficiency and human values.

7 | CONCLUSION

This review has proven that algorithmic rostering in nursing is not a neutral technological solution but rather a socio-technical intervention with implications that surpass mere efficiency. Although digital scheduling systems are extensively advocated as instruments to improve justice, transparency, and compliance, their impact on nurses' job happiness is significantly influenced by autonomy, fairness, openness, and trust. Based on the five nations examined—United Kingdom, Netherlands, Australia, Singapore, and South Korea—results consistently indicate that outcomes differ based on governance frameworks and cultural contexts. Top-down, required techniques frequently elicit resistance, whereas participatory and co-design strategies promote enhanced acceptance. In environments characterised by elevated institutional trust, such as Singapore, digital rostering was implemented seamlessly, however in hierarchical systems like South Korea, adherence was attained without a concomitant rise in job happiness. The synthesis of evidence indicates that effective implementation necessitates a balance between efficiency objectives and human-centered ideals. Autonomy must be maintained via systems for preference articulation and bargaining. Equity must be integrated into algorithmic principles to avert disparity. Transparency should encompass not only technical explanations but also feedback mechanisms and avenues for appeal. Trust must be fostered via engagement, dialogue, and attentiveness. This review proposes a socio-technical model of work satisfaction in algorithmic scheduling. The model emphasises the interrelation of autonomy, fairness, transparency, and trust, demonstrating that none is adequate on its own to maintain happiness. Collectively, these elements establish the conditions that enable algorithmic management to promote efficiency and improve nurses' well-being. The

findings emphasise that healthcare businesses should regard algorithmic rostering not merely as an efficiency challenge but as a chance to realign staff management with principles of fairness, inclusion, and professional respect. Future study ought to broaden the comparative scope to encompass under-explored places, employ longitudinal methodologies to assess long-term impacts, and incorporate mixed techniques that consider both technical efficacy and human experience. The review ultimately suggests that algorithmic rostering can enhance job happiness, if it is planned and executed as a collaborative socio-technical system. In the absence of this congruence, algorithms may intensify dissatisfaction, diminish trust, and jeopardise the workforce they are designed to assist.

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