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The Influence of Shift-Scheduling Fairness, Nursing Staff Sufficiency and Job Satisfaction on Nurse Loyalty

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Abstract: Nurse retention remains a pressing concern in many healthcare settings. Prior studies have shown that job satisfaction, perceived staffing adequacy, and fair shift scheduling may shape nurse loyalty; however, the evidence has often been mixed and inconsistent. Therefore, this study was conducted to re-examine the influence of Job Satisfaction, Nurse Sufficiency, and Shift Scheduling Fairness on Nurse Loyalty through a more comprehensive approach. This study aimed to assess how these three variables affect Nurse Loyalty and to identify which variable should receive priority in loyalty-enhancement efforts, using the Importance-Performance Map Analysis (IPMA) approach. The study used a quantitative approach with a cross-sectional design using SEM-PLS. The study involved 302 nurses selected through a sampling technique aligned with the characteristics of the targeted population. The results showed that Job Satisfaction had a significant and positive influence on Nurse Loyalty, while Nurse Sufficiency and Shift Scheduling Fairness did not have a significant direct effect. IPMA results further indicated that Job Satisfaction had the highest level of importance, yet its performance remained lower than the other two variables. This positions job satisfaction as the most urgent priority for improving nurse loyalty. The study highlights the need for healthcare organizations to focus on initiatives that strengthen nurse job satisfaction, including improvements in work conditions, managerial support, reward mechanisms, and employee well-being programs. Although adequate staffing and fair scheduling remain operational necessities, their influence on loyalty is indirect, suggesting they function more as supportive factors rather than primary determinants.

Keywords: Job Satisfaction, Nurse Loyalty, Nurse Sufficiency, Shift Scheduling Fairness, SEM-PLS, Importance-Performance Map

INTRODUCTION

The nursing profession plays a very important role in ensuring that healthcare services remain consistently available and of high quality. This is particularly evident in hospital settings, where the presence of skilled and dedicated nurses significantly contributes to patient

outcomes. However, in recent years, hospitals around the world have faced a growing challenge: nurses are leaving their positions at alarming rates, often due to dissatisfaction with their working conditions, particularly those related to shift scheduling fairness, staffing adequacy, and overall job satisfaction (Bae, 2024; Halcomb et al., 2020). As a result, healthcare administrators have become increasingly concerned with nurse loyalty, which reflects nurses' commitment and intention to remain within their organizations. High levels of loyalty are essential for maintaining organizational stability, reducing costs associated with staff turnover, and maintaining high-quality patient care (Al-Dossary, 2022; Astuti & Santoso, 2023).

Fairness in shift scheduling has emerged as one of the most influential factors related to nurse loyalty. Because hospitals operate 24 hours a day, complex scheduling procedures are necessary to balance nurses' personaland professional needs while ensuring continuous and safe patient care (Barker, Griffiths, & Dall'ora, 2025). When nurses perceive that scheduling practices are fair, transparent, and take into account their preferences and work-life balance, they tend to experience higher job satisfaction and greater loyalty to their organization (Stimpfel et al., 2025). In contrast, unfair or inconsistent shift allocation-such as disproportionate night shifts, insufficient rest between shifts, or perceptions of favoritism, can lead to frustration, burnout, and a higher intention to leave the job (Brossoit et al., 2020; Kang et al., 2025).

Recent research has underlined that fair scheduling is not only a matter of operational efficiency but also a factor that affects the psychological work environment. For example, Kang et al.,. (2025) showed that the use of AI-based IH-NASS (Inha University Hospital Nursing AI scheduling system) improves the performance of shift nurses and makes them happier by making things fairer and clearer. Barker et al.,. (2025) also points out that "one size fits all" scheduling methods often do not suit the needs and desires of all nurses. They suggest that flexible and participatory systems can help reduce friction and improve justice. Rerkjirattikal et al.,. (2020) also created a goal programming method that takes into account the unique preferences of nurses when compiling schedules. This supports the idea that fair scheduling is directly related to nurse morale and retention.

Recent research has emphasized that fair scheduling isnot merely an issue of operational efficiency but also a determining factor in psychological conditions in the workplace. Kang et al. (2025), for example, demonstrated that the AI-based IH-NASS (Inha University Hospital Nursing AI Scheduling System) improved shift performance and enhanced nurses' satisfaction by promoting greater fairness and clarity in scheduling. Similarly, Barker et al. (2025) argued that "one-size-fits-all" scheduling systems are often misaligned with nurses' diverse needs and preferences. They advocate for more flexible and participatory scheduling mechanisms to reduce friction and strengthen perceptions of fairness. Supporting this, Rerkjirattikal et al. (2020) developed a goal-programming scheduling model that integrates individual nurse preferences, further reinforcing the idea that fair scheduling is closely connected to nurse morale andretention.

Nurse availability is another critical factor that influences nurse loyalty. Adequate staffing, defined as the availability of a sufficient number of nurses to meet patient care needs, has significant implications for organizational performance and staff well-being (Brady et al., 2025; Carthy et al., 2025). Nurse shortages often lead to excessive workloads, increased stress, and fatigue, all of which are closely linked to decreased job satisfaction and intentions to resign (Bae, 2024). On the other hand, an appropriate level of nursing staff facilitates fair task distribution, stronger teamwork, and better patient care outcomes, thereby fostering a sense of value and commitment among nurses. Brady et al. (2025) and Carthy et al. (2025) also report that deliberate adjustments in staffing levels and skill mix directly influence job satisfaction and retention intentions among nurses. These findings suggest that maintaining an optimal nurse-to-patient ratio and ensuring a balanced workload are essential strategies for retaining nurse loyalty and reducing turnover rates.

Job satisfaction serves as an important bridge between structural working conditions, such as shift scheduling practices and workforce arrangements, and nurse loyalty. When nurses feel satisfied with their work environment, leadership, autonomy, and recognition, they are more likely to remain with the organization and act to support its overall goals (Abdullah et al., 2020; Al-Dossary, 2022). Satisfaction not only strengthens emotionalt attachment but also reduces the negative impact of stress and fatigue, ultimately increasing organizational commitment (Astuti & Santoso, 2023). Previous research highlights that strong internal service quality, demonstrated through supportive management, adequate resources, and fair organizational policies, has a significant impact on nurses' well-being, which in turn fosters loyalty and improves performance (Abdullah et al., 2020).

In this context, fairness in shift scheduling, adequacy of nursing staff, and job satisfaction are interrelated factors that together shape nurses' perceptions of fairness and trust in their organization. Nurses who feel that their shift schedules are fair, their workload is well managed, and their contributions are valued tend to develop long-term loyalty to their institution. Conversely, when these aspects are neglected, nurses may feel undervalued, overburdened, and emotionally detached, conditions that often contribute to higher turnover rates (Halcomb et al., 2020; Stimpfel et al., 2025).

Nurse loyalty is not only beneficial for hospital management but is also crucial for maintaining high-quality patient care. A stable workforce with competent nurses ensures continuity of care, reduces the likelihood of medical errors, and increases patient satisfaction (Wynendaele et al., 2020). Thus, understanding and improving the determinants of nurse loyalty carries significant implications for human resource management and health-care service outcomes.

Based on these considerations, this study seeks to examine the influence of shift scheduling fairness, adequate nursing staff, and job satisfaction on nurse loyalty. By analyzing the relationship between these characteristics, this study aims to provide evidence-based recommendations for hospital administrators in designing a fair scheduling system, maintaining adequate staffing levels, and creating a supportive work environment. Barker et al. (2025) and Kang et al. (2025) emphasize that fairness and transparency in scheduling, along with effective human-resource planning, are central to developing a nursing workforce that is loyal, satisfied, and high-performing.

Ultimately, hospitals must address these issues if they want to retain their workforce and provide high-quality patient care. By implementing fair scheduling practices, ensuring adequate staffing levels, and creating working conditions that support nurses' well-being, hospitals can build a healthy organizational culture where nurses feel satisfied with their roles and are committed to staying with the institution for the long term.

METHOD

Research Design

This study used a quantitative approach with an explanatory research design aimed at analyzing the direct effects of shift scheduling fairness, nurse sufficiency, and job satisfaction on nurse loyalty. An explanatory design was selected because the study focuses on testing causal relationships among variables using structured measurement instruments. The analysis technique utilized was Structural Equation Modelling based on Partial Least Squares (SEM-PLS), which was chosen due to the presence of multiple latent constructs and reflective indicators. SEM-PLS is well-suited for variance-based analysis, particularly when data may deviate from normal distribution or when models are complex. This method is also recommended when the research objective involves prediction and theory development, making it consistent with the aims of the present study.

Population and Sample

The study population consisted of registered nurses working in type B and type C hospitals in the study area. Nurses were selected as the population due to the direct relevance of the examined variables, shift scheduling, staffing adequacy, and job satisfaction, which are known to influence loyalty. A purposive sampling technique was applied using the following inclusion criteria: (1) permanent or contract nurses with at least one year of work experience, (2) nurses who had experience working under a shift system, and (3) individuals willing to complete the questionnaire. The minimum sample size was set at 250 respondents, following Hair et al. (2021), who recommend that SEM-PLS requires samples equivalent to 5-10 times the number of indicators, or at least 200-300 respondents for complex models. A total of 302 nurse respondents participated in and completed the study.

Data Collection Procedures

Data were collected through both online and paper-based questionnaires distributed to nurses in the selected hospitals. The questionnaire employed a five-point Likert scale ranging from "strongly disagree" to "strongly agree." The instrument was developed through adaptations of established and validated measurement scales: Shift Scheduling Fairness was adapted from hospital management literature; Nurse Sufficiency was based on the concept of staffing adequacy in nursing; Job Satisfaction was adapted from the Minnesota Satisfaction Questionnaire; and Nurse Loyalty drew from scales measuring affective commitment and intention to stay.

Operational Definitions and Measurement Indicators

Shift Scheduling Fairness refers to nurses' perceptions of fairness in shift allocation, including workload distribution, opportunities to express scheduling preferences, and the transparency of scheduling procedures. Nurse Sufficiency denotes perceived adequacy of staffing within the work unit, ensuring workloads can be managed effectively. Job Satisfaction reflects the extent to which nurses feel satisfied with their job, work environment, interpersonal relationships, and recognition received. Nurse Loyalty describes the nurses' intention to remain in their organization, contribute to its long-term goals, and refrain from seeking employment elsewhere. Each variable consisted of four to six reflective indicators measured through closed-ended statements aligned with their respective theoretical constructs.

Data Analysis Techniques

Data analysis was conducted in several stages using SEM-PLS. First, the outer model was evaluated to assess convergent validity (via loading factors and Average Variance Extracted [AVE]), discriminant validity (using the Heterotrait–Monotrait Ratio, HTMT), and construct reliability (using Cronbach's Alpha and Composite Reliability). AVE values of ≥ 0.50 and reliability coefficients of ≥ 0.70 were used as criteria for model adequacy. Second, the inner model was examined to evaluate the structural relationships among variables through path coefficients, t-statistics, p-values, and R^2 values, which indicate the model's explanatory power. Bootstrapping with 5,000 subsamples was applied, as recommended by Hair et al. (2021), to obtain stable significance estimates.

Additional analyses included predictive relevance (Q^2) and effect size (f^2), which were evaluated to determine the magnitude and relevance of structural paths. Common method bias (CMB) was tested using Harman's single-factor test to ensure that measurement bias did not affect the results. All data were processed using SmartPLS 4 software.

Research Ethics

This study adhered to established ethical standards for health research by ensuring the confidentiality and anonymity of all respondents. Informed consent was obtained prior to the

completion of the questionnaire, and participants were informed of their right to withdraw from the study at any time without consequence. All data collected were used exclusively for academic and research purposes.

The research method contains the type of research, sample and population or research subjects, time and place of research, instruments, procedures, and research techniques, as well as other matters relating to the method of research. This section can be divided into several sub-chapters, but no numbering is necessary.

RESULTS AND DISCUSSION

Table 1. ***Outer Loadings***

	Job Satisfaction	***Nurse Loyalty***	***Nurse Sufficiency***	***Shift Scheduling Fairness***
JS1	0.757			
JS2	0.849			
JS3	0.797			
JS4	0.794			
JS5	0.839			
JS6	0.844			
JS7	0.856			
JS8	0.830			
NL1		0.783		
NL3		0.834		
NL4		0.874		
NL5		0.835		
NL6		0.825		
NL7		0.759		
NL8		0.720		
NS1			0.893	
NS2			0.947	
NS3			0.898	
SSF 2				0.834
SSF 3				0.868
SSF 4				0.928
SSF 5				0.933
SSF 6				0.867

Table 1 shows the external load values for each indicator on the latent variables analyzed in this study, Job Satisfaction, Nurse Loyalty, Nurse Adequacy, and Shift Schedule Fairness. Almost all indicators show load values above the threshold of 0.70, indicating that they meet the criteria for convergent validity. For Job Satisfaction, all indicators (JS1-JS8) ranged from 0.757 to 0.856, indicating that each item adequately reflected the underlying construct. Indicators for Nurse Loyalty also showed strong load values, ranging from 0.720 to 0.874. Nurse Adequacy displayed very high load values (0.893-0.947) for all three indicators (NS1-

NS3), indicating a strong representation of the construct. Similarly, Shift Scheduling Fairness showed consistently high values, ranging from 0.834 to 0.933. Overall, these results indicate that all indicators are both reliable and valid in capturing their respective constructs.

Table 2. Discriminant Validity

	Job Satisfaction	*Nurse Loyalty*	*Nurse Sufficiency*	*Shift Scheduling Fairness*
Job Satisfaction				
Nurse Loyalty	0.772			
Nurse Sufficiency	0.110	0.067		
Shift Scheduling Fairness	0.083	0.066	0.977	

Table 2 shows the results of discriminant validity based on the correlations between constructs. Overall, the variables show relatively low correlations between variables, indicating that each construct is empirically distinct. For example, the correlation between Job Satisfaction and Nurse Loyalty is 0.772, indicating that although the two variables are related, they still represent separate theoretical concepts. Correlations involving Nurse Sufficiency are particularly small (0.067–0.110), reinforcing that this construct stands alone and does not overlap significantly with others. Shift Schedule Fairness also shows low correlations with other variables, except for its very high correlation with Nurse Sufficiency (0.977), which indicates a strong conceptual relationship and requires further confirmation through the Fornell–Larcker criteria or HTMT ratio. Overall, the results show that most constructs in the model demonstrate adequate discriminant validity.

Table 3. Validity and Reliability

	Cronbach's alpha	*Composite reliability*	*Average variance extracted (AVE)*
Job Satisfaction	0.931	0.936	0.675
Nurse Loyalty	0.909	0.915	0.649
Nurse Sufficiency	0.901	0.952	0.833
Shift Scheduling Fairness	0.944	0.789	0.786

Table 3 reports Cronbach's Alpha, Composite Reliability, and Average Variance Extracted (AVE) values for all variables included in the model. Job Satisfaction shows excellent internal consistency, with a Cronbach's alpha value of 0.931, composite reliability of 0.936, and AVE of 0.675, indicating that its indicators explain more than 67% of the construct variance. Nurse Loyalty and Nurse Adequacy also showed strong reliability, each with a composite reliability value exceeding 0.90 and an AVE value well above the recommended minimum threshold of 0.50. Shift Schedule Fairness also showed high internal consistency, reflected in a Cronbach's alpha of 0.944 and an AVE of 0.786, indicating that its indicators

effectively capture the construct. Overall, all variables met the criteria for convergent validity and reliability within the model.

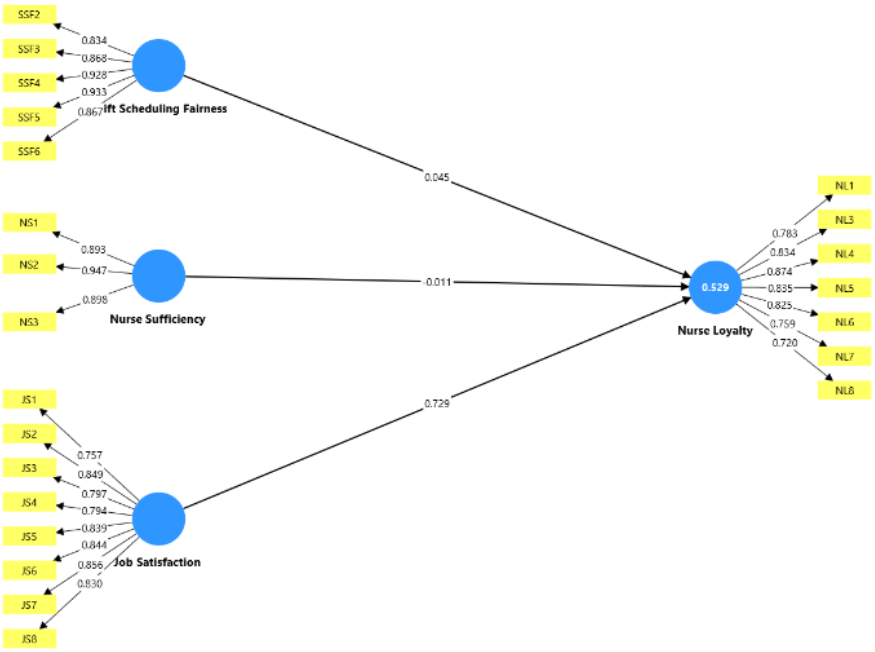

Figure 2. ***Outer Model***

Figure 2 shows a visualization of the external model used in this study. Overall, the evaluation results indicate that all constructs, Job Satisfaction, Nurse Loyalty, Nurse Adequacy, and Shift Schedule Fairness, meet the criteria required for inclusion in the structural model. Based on external loadings, all indicators show values above 0.70, indicating that each item strongly and validly represents its respective construct. Further discriminant validity assessment confirms that most variables show low inter-construct correlations, allowing the constructs to be clearly distinguished from one another. Additionally, reliability tests, reflected through Cronbach's alpha and composite reliability, showed that all variables had strong internal consistency, with values exceeding the recommended minimum threshold of 0.70. AVE values, all above 0.50, indicated adequate convergent validity. Overall, these findings confirm that the outer model meets all validity and reliability requirements, allowing the analysis to proceed to the evaluation of the inner model.

Table 4. ***Inner VIF***

	VIF
Job Satisfaction -> Nurse Loyalty	1.011
Nurse Sufficiency -> Nurse Loyalty	4.487
Shift Scheduling Fairness -> Nurse Loyalty	4.474

The Internal VIF table describes the level of multicollinearity among predictor variables related to the endogenous construct, Nurse Loyalty. The VIF value for Job Satisfaction is 1.011, indicating no multicollinearity. Meanwhile, the VIF values for Nurse Availability (4.487) and Shift Schedule Fairness (4.474) are also below the generally accepted threshold of 5, indicating that these two variables do not exhibit problematic multicollinearity. Thus, all predictor variables can be considered stable and suitable for inclusion in the structural model, without collinearity issues that could interfere with the accuracy of parameter estimation.

Table 4. *R-Square*

	R-square	***R-square adjusted***
Nurse Loyalty	0.529	0.524

The R-squared table shows that Nurse Loyalty is explained by Job Satisfaction, Nurse Adequacy, and Shift Schedule Fairness at a level of 0.529, or 52.9%. These findings indicate that more than half of the variation in Nurse Loyalty can be explained by the three independent variables included in the model. The adjusted R-squared value of 0.524 further confirms the stability and consistency of the model after considering the number of predictors. Overall, these values fall into the moderate category, indicating that the model has sufficient explanatory power.

Table 6. *F-Square*

	f-square
Job Satisfaction -> Nurse Loyalty	1,118
Nurse Sufficiency -> Nurse Loyalty	0,000
Shift Scheduling Fairness -> Nurse Loyalty	0,001

Table *F-square* shows the contribution of each predictor variable to *Nurse Loyalty*. The *Job Satisfaction* variable has an f-square value of 1.118, which is classified as a very large effect, indicating that this variable has a substantive and significant influence on changes in *Nurse Loyalty*. Conversely, Nurse Sufficiency has an F-square value of 0.000 and Shift Scheduling Fairness has a value of 0.001, both of which are classified as very small effects or have almost no contribution to changes in Nurse Loyalty. Thus, Job Satisfaction is the most dominant predictor in the model, while the other two variables play a minimal role in influencing Nurse Loyalty.

Table 7. Q^2

	Q^2predict
Nurse Loyalty	**0.497**

The Q^2predict table reports a Q^2 value of 0.497 for the Nurse Loyalty variable. Because this value is well above zero, it indicates that the model demonstrates strong predictive capability. A value approaching 0.50 suggests that the model is able to generate meaningful and reasonably robust predictions for Nurse Loyalty. Thus, the model not only explains variance but also possesses adequate relevance in predicting the outcome variable.

Table 8. Hypothesis Test Results

Hypotheses	**Original Sample (O)**	**T-Statistics**	**P-Values**	**Description**
Shift Scheduling Fairness → Nurse Loyalty	0,045	0,575	0,565	**Not significant**
Nurse Sufficiency → Nurse Loyalty	-0,011	0,142	0,887	**Not significant**
Job Satisfaction → Nurse Loyalty	0,729	12,346	0,000	**Significant**

The hypothesis test results show that the effect of Shift Schedule Fairness on Nurse Loyalty is not statistically significant. This is reflected in the original sample value of 0.045, with a T value of 0.575 and a P value of 0.565. Since the P value is well above the threshold of 0.05, it can be concluded that the perception of fairness in shift scheduling does not contribute significantly to nurse loyalty. Similarly, Nurse Staffing Adequacy also did not show a significant effect on Nurse Loyalty, as indicated by the original sample value of –0.011, a T value of 0.142, and a P value of 0.887. These results show that perceptions of staffing adequacy do not have a measurable impact on nurse loyalty.

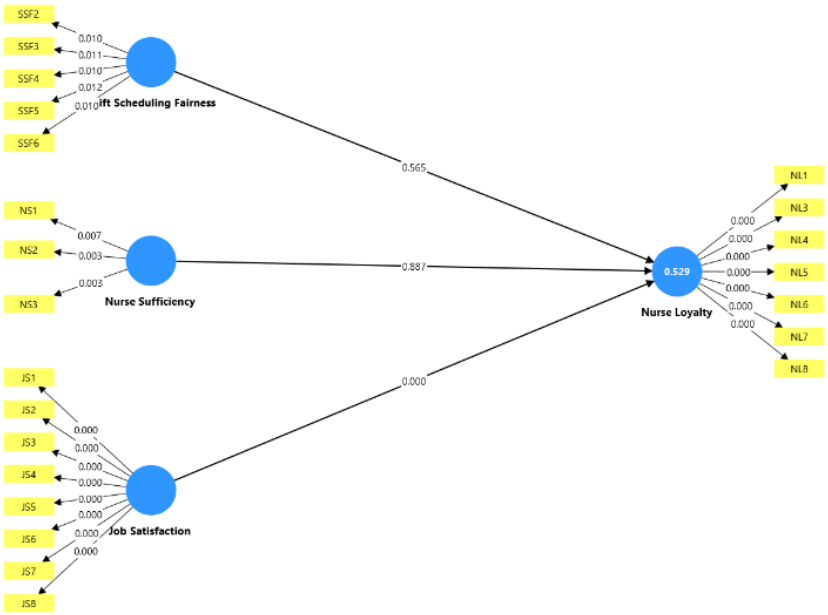

Figure 3. ***Inner Model***

Based on the results of the inner model evaluation, it can be concluded that Job Satisfaction is the most influential factor in increasing Nurse Loyalty. This is supported by its high and significant path coefficient, as well as an f-square value indicating a very strong effect. In contrast, Nurse Sufficiency and Shift Scheduling Fairness do not show a significant influence on Nurse Loyalty, as reflected in their low T-statistics and p-values far above 0.05. Although both variables demonstrate strong performance in the IPMA analysis, their importance levels toward Nurse Loyalty are relatively low, suggesting that improvements in these variables would not produce a meaningful impact.

The R-square value of 0.529 indicates that Job Satisfaction, Nurse Sufficiency, and Shift Scheduling Fairness collectively explain 52.9% of the variance in Nurse Loyalty, which falls under the moderate category. The Q^2 value of 0.497 further suggests that the model possesses good predictive relevance. Additionally, the VIF results confirm that there is no multicollinearity issue among the predictors, ensuring that the model is stable and appropriate for use.

Overall, the inner model demonstrates that enhancing Nurse Loyalty primarily depends on strengthening Job Satisfaction. Therefore, organizations should prioritize policies and interventions aimed at improving nurses' job satisfaction as an effective strategy for increasing loyalty.

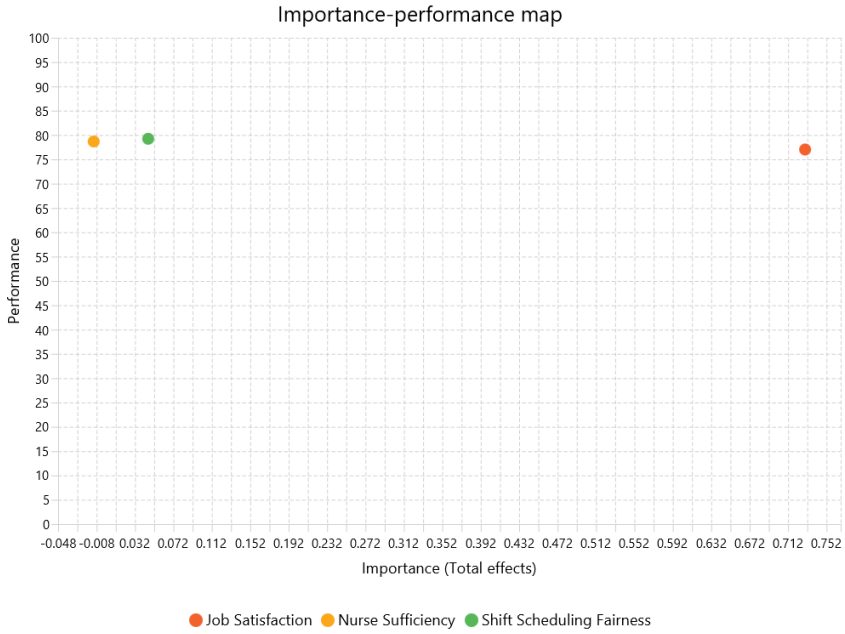

Figure 4. *IPMA Map* - Construct

The Importance-Performance Matrix Analysis (IPMA) for the Nurse Loyalty construct shows that Job Satisfaction has the highest importance level, with a total effect of 0.729. This confirms that job satisfaction is the most influential factor in increasing nurse loyalty. However, its performance score of 77.024 is lower than the other two variables, indicating that although job satisfaction has a strong influence, its current performance is relatively weaker. Therefore, Job Satisfaction should be prioritised for improvement, as strengthening this factor will have the greatest impact on Nurse Loyalty.

Meanwhile, Nurse Sufficiency shows a very small, and even negative, total effect (–0.011), suggesting that staffing adequacy does not contribute meaningfully to Nurse Loyalty. Despite its relatively high performance score of 78.670, further improvement in this variable is not expected to meaningfully enhance nurse loyalty.

The variable Shift Scheduling Fairness has a total effect of 0.045, indicating a low level of importance. Nevertheless, it has the highest performance score among the three variables (79.229). This suggests that nurses already perceive shift scheduling fairness to be at a satisfactory level; however, increasing this variable further would not significantly influence Nurse Loyalty.

The findings of this study indicate that Job Satisfaction has a strong and significant influence on Nurse Loyalty, whereas Nurse Sufficiency and Shift Scheduling Fairness do not demonstrate significant effects. These results are in line with a substantial body of international literature emphasising the central role of job satisfaction in fostering nurse loyalty. Abdullah et al. (2020) highlight that internal service quality and employee well-being substantially contribute to job satisfaction, commitment, and performance among nurses. Similarly, Al-Dossary (2022) reports that quality of work life and job satisfaction are primary determinants of nurse loyalty in hospitals in Saudi Arabia. This is further reinforced by Astuti and Santoso (2023), who identify job satisfaction as a critical component in nurse loyalty models within Islamic hospitals in Indonesia. Collectively, these studies underscore that improving job satisfaction remains a strategic imperative for strengthening nurse loyalty, which is fully consistent with the results of the current study.

Although relevant in nursing practice, Nurse Adequacy did not show a significant direct effect on Nurse Loyalty in this study. This finding contrasts with Bae's (2024) research, which showed that workload, workforce adequacy, and working hours affect job satisfaction, intention

to leave, and fatigue. However, the absence of a direct effect in the current model may indicate that although staffing levels are operationally important, they do not always lead to loyalty outcomes unless mediated by other variables. Nurses may be able to adapt to staffing challenges or receive compensatory organizational support that reduces the impact of staffing concerns on loyalty. This interpretation is in line with Carthy et al. (2025), who argue that staffing levels often influence the work environment and operational pressures rather than loyalty directly. Therefore, the effects of Nurse Staffing Adequacy may be more indirect, operating through constructs such as stress, morale, or job satisfaction, rather than functioning as a direct predictor of loyalty.

Findings on Shift Scheduling Fairness also showed no direct influence on Nurse Loyalty, although this variable has a high performance in IPMA. These results do not completely contradict the previous literature, but indicate a more complex dynamic. Some studies, such as Stimpfel et al. (2025), confirmed that satisfaction with shift scheduling greatly affects job satisfaction and work-life balance. Similarly, the study of Brossoit et al. (2020) found that schedule control had an effect on sleep quality, job satisfaction, and intention to stay at work. Barker et al. (2025) also point out that shift scheduling is a highly contextual issue and there is no one-size-fits-all strategy. Similarly, Rerkjirattikal et al. (2020) explained that individual preference in scheduling is an important aspect for the schedule to be perceived as fair. In fact, Kang et al. (2025) showed that automated scheduling systems can improve the quality of work and satisfaction of nurses.

The results also showed that shift scheduling fairness did not significantly affect nurse loyalty, even though it scored high on the IPMA. These results were not entirely inconsistent with previous studies, but highlighted a more complex dynamic. Several studies, including Stimpfel et al. (2025), emphasised that satisfaction with shift scheduling strongly influences job satisfaction and work-life balance. Similarly, Brossoit et al. (2020) found that schedule control affects sleep quality, job satisfaction, and attitudes related to retention. Barker et al. (2025) further argued that shift scheduling is highly contextual and that no scheduling strategy is universally optimal. Additionally, Rerkjirattikal et al. (2020) showed that individual preferences play a key role in shaping perceptions of fairness, while Kang et al. (2025) suggested that automated scheduling systems can improve work quality and satisfaction.

The lack of significance in this study may indicate that although nurses consider shift scheduling to be fair, as reflected in high performance scores, they do not consider it a major factor determining loyalty. This interpretation is reinforced by Brady et al. (2025), who suggest that factors such as leadership, job satisfaction, and the overall work environment have a stronger influence on nurse retention than the scheduling system alone.

Overall, the IPMA results reinforce that Job Satisfaction is a variable that should be a top priority because it has the highest level of importance but its performance is lower than other variables. Job satisfaction can be improved by enhancing the quality of the work environment, organizational support, career development, and staff welfare, as recommended by Halcomb et al. (2020) and various other studies.

CONCLUSION

This study concludes that job satisfaction is the only factor that significantly influences nurse loyalty. These findings highlight that efforts to strengthen nurse loyalty should prioritize improving job satisfaction through improvements in the work environment, organizational support, and employee welfare. Meanwhile, Nurse Availability and Shift Schedule Fairness did not show a significant effect on nurse loyalty, even though both had high performance scores in the IPMA analysis. This indicated that although nurses view workforce adequacy and shift scheduling fairness positively, these aspects are not considered key determinants of loyalty. The moderate R-square value and strong predictive relevance (Q^2) indicated that the model had adequate explanatory and predictive power regarding nurse loyalty. Overall, the research results

suggest that strategies aimed at increasing nurse loyalty in healthcare settings should focus on improving job satisfaction, while workforce adequacy and shift scheduling fairness serve as supporting factors without direct influence.

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