

Nurse Staffing Ratios, Non-Clinical Workload and Job Satisfaction among Registered Nurses in Private Haemodialysis Centres in Sarawak: Mediating Effects of Workload and Moderating Influence of Work Environment

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ABSTRACT

Measuring job satisfaction of nurses helps find potential retention, workplace operation, and care quality issues. Specialized private haemodialysis units have unique factors that impact nurses' experiences. Given how dispersed Sarawak's healthcare system is, there is a lack of literature on private haemodialysis.

This study aims to understand private haemodialysis centres registered renal post-basic nurses working in Sarawak, how they perceive staffing ratios, non-clinical tasks they experience, workload, work environment, and job satisfaction. Workload was assessed as the proposed statistical mediator for the non-clinical task burden and job satisfaction, while the work environment was assessed as the proposed work from staffing-ratio perception and job satisfaction.

This study utilized a quantitative cross-sectional research design on 141 registered renal post-basic nurses working in 25 private haemodialysis centers situated in Sarawak, Malaysia. The data were collected using a self-administered questionnaire developed for the study. The data were analysed statistically using descriptive statistics, correlation analysis, multiple regressions, mediation analysis, and moderation analysis.

Non-clinical tasks were the only statistically significant unique predictors of job satisfaction in the regression model. There was a statistically significant indirect relationship between the non-clinical task burden and job satisfaction through perceived workload. The work environment did not statistically moderate the staffing-ratio perception and job satisfaction relationship.

The results illustrate how private haemodialysis renal-trained nurses perceive their job satisfaction is impacted by their perceived workload and burden of non-clinical tasks. Given the nature of the data as cross-sectional, the relationships should be interpreted as statistical co-occurrences rather than causal. Nevertheless, these results may help future researchers design longitudinal studies and workforce-management initiatives that adjust task allocation, workload, and specialised renal nursing.

Keywords: nurse staffing, workload, haemodialysis nursing, job satisfaction, healthcare workforce management

INTRODUCTION

The healthcare industry has a growing issue with its workforce. There is more demand for services, fewer staff, more complex patients, and more administrative work. The largest portion of the workforce in healthcare is nurses, and they are vital in providing patient safety and continuity of care. It is of great concern to an organization when nurses are not satisfied with their job, as it affects the organization's retention, performance, and the quality of care provided.

Nurses that are satisfied with their job create a safer environment for patients, have less intent to leave, have

less burnout, and have a greater commitment to the organisation. The opposite is true for job dissatisfaction. It leads to more absenteeism, burnout, and disengagement, and it increases the turnover rate. This is problematic for all the healthcare system, but more so for specialty nursing, where the outcome of a procedure can mean life or death for a patient.

This is particularly the case in nursing dialysis. Nurses working in this specialty must have responsibility for the maintenance of vascular access and the care and monitoring of an extracorporeal circuit; they also need to be constantly prepared for dialysis adjustments and watching for any complications that require immediate attention. They also have to spend a considerable amount of time with patients. Unlike other specialties, the procedures are repeated throughout numerous hours during nursing dialysis and the nurse is constantly observing the patient's stability.

The nurse workload is an important issue in private haemodialysis centres as its level may be related to cost limitations and productivity of the centre. Many private renal care centres require their nurses to do multiple tasks, including performing direct patient care tasks and taking on many non-clinical tasks, such as documenting care, coordinating machine and equipment inventory and preparation, supervising cleanliness of the centre, scheduling, managing supplies, and troubleshooting.

The increasing number of non-clinical tasks may contribute to role ambiguity and divert nurses from direct clinical care. This contamination of tasks and roles has been shown to lead to low professional fulfilment and high levels of psychological stress and has resulted in poor job satisfaction among nurses.

These issues are particularly prevalent in Sarawak due to its large size and large, unbalanced population distribution. The delivery of renal care services in private haemodialysis centres located in different communities presents additional challenges of staffing and functioning which increases the organisational and nursing workload.

Though private haemodialysis services are strategic and emerging to care for patients with chronic kidney disease, there is a dearth of research focusing on the satisfaction of the nursing workforce in this sector, especially in the healthcare context of East Malaysia. The few available studies have focused on the nursing population in general hospitals, public services, and broad concepts of burnout without adequately exploring the renal care specialty and the levels of satisfaction of nurses in these services.

Less focus has been put on the staffing ratios and how they affect workload transmission pathways to show how the organisational work environment conditions possibly modify these relationships in the private haemodialysis contexts.

This has created a large gap in research and literature. Knowledge of these relationships will help healthcare managers and administrators develop strategies that are grounded in evidence to better retain their workforce, enhance the sustainability of the clinical services, and improve the quality of renal care services.

Based on Herzberg's Two-Factor Theory, this research will explore the relationship between nurse staffing ratios, the non-clinical task burden, and the work environment to deliberately model and test the theories within the context of private haemodialysis centres in Sarawak.

The study aims to model workload as a mediator of the association between non-clinical task burden and job satisfaction, and test if the work environment acts as a moderator between the two.

This research has the potential to contribute to the existing body of knowledge in the following ways: First, it will advance Herzberg's theory within the context of private renal nursing. Second, it will be the first of its kind to focus on East Malaysia within the healthcare context. Lastly, it will identify an approachable strategy to address operational workload distribution to reduce organisational constraints on job satisfaction within the specialised renal workforce.

The results will help private healthcare administrators and renal service policymakers who are focused on improving their capacity to provide long-term haemodialysis care.

LITERATURE REVIEW

Herzberg's Two-Factor Theory and Nurse Job Satisfaction

Job satisfaction is one of the most studied constructs in organisational behavior and healthcare workforce research. Herzberg's Two-Factor Theory asserts that motivational factors, when satisfied, result in varying levels of contentment, and that hygiene factors, when sufficiently met, prevent dissatisfaction; however, when missing, they can lead to dissatisfaction. For Herzberg, hygiene factors include organisation, supervision, salary, interpersonal relationships, and working conditions; motivational factors include recognition, achievement, and growth, as well as other facets of one's job.

In high-intensity environments, such as in healthcare, the satisfaction of nurses is more closely related to hygiene factors. The conditions of an organisation that most directly affect the psychological and professional functioning of nurses include: the adequacy of staff, the distribution of the workload, the support of the organisation, and the climate of the workplace. In the absence of these, satisfaction is inevitably lost, regardless of the existence of intrinsic professional motivation (Herzberg, 1968).

In an even more intense environment like that of a specialised renal care unit, where nurses must perform long and continuous procedures of haemodialysis, the various conditions of Herzberg's Theory of Worker Motivation apply most readily to understand the satisfaction of haemodialysis nurses.

Nurse Staffing Ratios and Workforce Satisfaction

The nursing staffing level directly impacts on the well-being of nurses and the quality of care provided to patients. The research by Aiken and colleagues showed that adverse nurse-to-patient ratios were associated with higher levels of burnout and job dissatisfaction, as well as patient mortality (Aiken et al., 2002).

Later, similar studies in other nations showed that higher nurse workloads lead to higher levels of professional dissatisfaction and the intent to leave one's job (Aiken et al., 2014). Inadequate staffing leads to task overload and care delivery time reverence, as well as psychological stress and diminished patient care observation.

More advanced forms of dialysis, such as haemodialysis, require continuous staff observation and monitoring of the dialysis machine, as well as prompt response to any adverse events that may occur.

In areas served by the Sarawak healthcare system, which is already characterized by limited staffing and uneven distribution of the workforce, there may be chronic staffing constraints that directly impact nurse satisfaction.

Non-Clinical Workload and Role Contamination

Non-clinical task burden refers to the administrative, logistical, clerical, and operational duties assigned to nurses beyond their patient-care duties.

"Non-clinical task allocation" means "taking time away from clinical practice," which leads to dissatisfaction among nurses (Kutney-Lee et al., 2013). Tasks such as administrative documentation, control of inventory, scheduling, oversight of housekeeping, and clerical duties reduce the sense of fulfilment of nurses' professional roles.

This situation is known as role contamination, meaning that the peripheral operational requirements have contaminated the nurses' clinical identity and satisfaction.

This is especially true in haemodialysis where nurses must be highly concentrated and precise with the procedures, and where the interruption with the inclusion of non-clinical duties is even more bothersome.

Prolonged role contamination has been associated with job frustration and lower organisational commitment

among nurses (Lake et al., 2019).

This indicates that non-clinical duties have become an even greater source of dissatisfaction for renal nurses.

Workload as a Mediating Mechanism

Workload is one of the main linking factors between structural workplace variables and psychological outcomes. It is also a direct stressor.

According to Bakker and Demerouti (2007), within the Job Demands-Resources model, workload represents a core job demand that, in the absence of sufficient organisational support, has a depleting effect on psychological resources and leads to exhaustion.

An increased staffing ratio leads to an increased task burden, compressed decision-making, and recovered-state-rest time, which, in combination, lead to an increased perception of workload.

Workload has been shown to mediate the relationship between staffing adequacy and job satisfaction in both empirical studies and the nursing population in general (Van Bogaert et al., 2014).

Within specialised renal nursing, workload is further amplified by the constant supervision of machines and the repetitive nature of nursing procedures.

Therefore, within the nursing context, workload is a strong mediator between staffing levels and satisfaction.

Work Environment as a Moderating Factor

The nursing work environment includes aspects such as leadership, teamwork, communication, and the resources available to you.

According to the Practice Environment Scale by Lake (2002), positive nursing environments lead to increased retention, satisfaction, and clinical performance.

It is believed that supportive environments can mitigate the negative consequences of operational stress by improving resilience and teamwork and increasing professional autonomy.

There is ambiguity in the literature regarding these moderating effects.

Although some studies show that organisational support mitigates the negative consequences of workload dissatisfaction (Laschinger & Leiter, 2006), others suggest that in high-tech clinical environments, the negative consequences of structural workload e.g. lack of resources, will outweigh the positive effects of the environment.

This is especially true in private haemodialysis environments, where the operational demands are very specific and unique.

Research Gap

Though many studies have been conducted on nurse satisfaction, burnout, and organisational climate, not many studies have been conducted on private haemodialysis centres in East Malaysia.

Most of the studies conducted focused on public hospitals or general nursing populations. There has been little interest in post-basic renal nursing populations working in privately managed dialysis units.

Additionally, not many studies have examined workload as a full mediating factor between satisfaction and the work environment, while also considering the work environment as a moderator, in the relation between staffing ratio and satisfaction.

This study will consider these relationships in the context of private haemodialysis centres in Sarawak.

RESEARCH HYPOTHESES DEVELOPMENT

This study is based on Herzberg's Two-Factor Theory, which states that inadequate organisational and environmental workplace conditions act as hygiene factors that result in employee dissatisfaction. It is assumed that in specialised haemodialysis nursing environments, factors such as adequate staffing, workload, and organisational support can indirectly and directly influence job satisfaction.

It is well documented that inadequate staffing increases professional strain by reducing the capacity of the workflow and increasing the demand of tasks. In specialised renal nursing, the potential effect of inadequate staffing is increased by the technical nature of dialysis procedures and the need for continuous attention during the procedure. Therefore, adequate staffing is presumed to influence nurse satisfaction.

H1: Nurse staffing-ratio perception is significantly associated with job satisfaction among registered nurses in private haemodialysis centres.

Inadequate staffing is not the only issue causing clinical professionals to be dissatisfied. There are other non-clinical duties such as documenting, coordinating inventory, scheduling, and performing other supporting tasks that take time away from direct patient care and lead to job dissatisfaction. It has been documented that assigning too many peripheral tasks leads to role contamination and job dissatisfaction among clinical nurses.

H2: Non-clinical task burden is significantly associated with job satisfaction among registered nurses in private haemodialysis centres.

The relation between staffing ratio and satisfaction probably happens through workload transmission mechanisms. With limited staff, nurses often must take on additional clinical responsibilities, increasing perceived workload and psychological stress. The Job Demands-Resources model implies that exceeding the workload capacity reduces the coping resources available to the individual and results in dissatisfaction.

Therefore, workload is proposed as an explanatory mechanism through which the staffing ratio is related to job satisfaction.

H3: Workload statistically mediates the association between non-clinical task burden and job satisfaction among registered nurses in private haemodialysis centres.

Burnout was originally thought to be a parallel mediating construct with regards to the chronic occupational stress-professional dissatisfaction relationship. However, upon testing the statistics to refine the model, The analysis showed that burnout had substantial conceptual overlap with workload, and the two measures were strongly related. To maintain clarity, and avoid redundancy, the authors decided not to include the analysis of burnout mediation in the final model.

H4: Burnout mediation analysis was excluded following model refinement due to multicollinearity diagnostics and conceptual overlap with workload constructs.

Supportive workplace environments have been noted as positive organisational resources that lessen the effects of operational strain. Leadership support and a collaborative culture can reduce the psychological impact of staffing pressures and keep professionally fulfilling environments.

Therefore, work environment has been proposed as a moderator.

H5: Work environment moderates the association between staffing-ratio perception and job satisfaction among registered nurses in private haemodialysis centres.

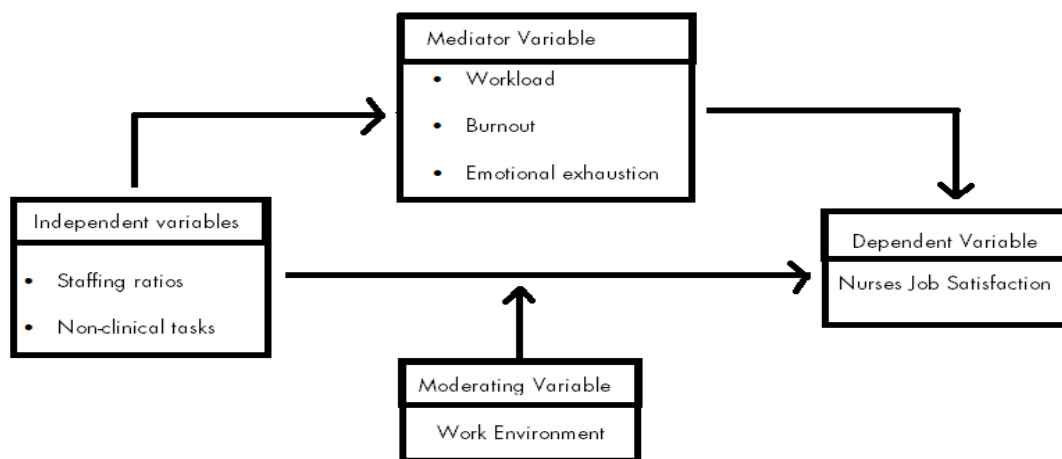


Figure 1 presents the conceptual framework illustrating the hypothesised direct, mediating, and moderating relationships examined in this study.

METHODS

Research Design

This study used a quantitative cross-sectional design to understand the relationship between nurse staffing ratio, non-clinical task burden, workload, work environment, and job satisfaction of registered nurses working in private haemodialysis centres in Sarawak.

A quantitative approach was appropriate as the main purpose of the study was to analyse the hypothesized relationships between some measurable variables of the organization using statistics. The use of a cross-sectional design allowed the researchers to collect data only once and understand the current perceptions of the workforce in the various private renal care settings.

This design is quite popular in healthcare workforce research because it helps identify important relationships and pathways in complex clinical settings.

The study was based on Herzberg's Two-Factor Theory, where the author suggests that within the work condition of an organization, dissatisfaction is a result of inadequate staffing, heavy workload and inadequate support from the institution.

Research Setting

The study was conducted at 25 private haemodialysis centres in Sarawak, which covers a range of renal care facilities located in urban and semi-urban areas.

Patients at these centres undergo outpatient haemodialysis treatment for end-stage renal disease. Continuity and safety of the treatment depend on specialised renal nursing personnel.

This context of private haemodialysis was chosen because the workforce needs of these centres are different from the needs of a general hospital nursing setting. Nurses in these centres often take on extended operational roles, and as such, are appropriate for studying workload and satisfaction.

Population and Sampling

The study focused on about 175 registered renal post-basic nurses employed by 25 private haemodialysis centers in Sarawak. According to the Cochran sample size method, the minimum sample size was set at 141 respondents.

Given the nature of the study, we expected to find at least one participant from each of the participating haemodialysis centers. However, participation was made by filling out a Google Form and was distributed to staff in the participating centers. Given the voluntary nature of the survey, only staff who were eligible were able to fill it out.

As a result, the sample was based on voluntary participation rather than trying to cover each of the centers. Participants were not randomly selected from the centers and there was no lower limit on the number of responses from each center. In addition, the researcher did not select a particular staff from the staff list of each center. Instead, the aim of the response collecting method is to ensure that responses are collected from the 25 centers while keeping voluntary participation and ensuring that the respondents' identities are maintained.

This approach could accommodate nurses based in multiple private haemodialysis clinics in Sarawak, and access to nurses did not disrupt clinical operations. However, since participation was voluntary, there is a chance that self-selection bias occurred. Participating nurses may have had perceptions and experiences different from those that did not participate. This should be taken into consideration when interpreting the findings in terms of representativeness and generalizability.

Research Instrument

A self-administered questionnaire designed to assess the work environment, staffing ratio perceptions, the non-clinical burden of work, workload and job satisfaction of registered renal post-basic nurses working in private haemodialysis centers was used to collect survey data in Sarawak. The questionnaire had six sections. The sections addressed the work environment, staffing ratios perceptions, non-clinical tasks, job satisfaction, overall workload, and overall job stress. However, demographic information does not have a scoring section.

Answers to all the sections except for demographic information were scored on a five-point Likert scale. One (1) = Strongly Disagree and five (5) = Strongly Agree. The operational definitions and measurement instruments for the main study variables are described below.

Staffing Ratio Perception

Staffing ratio was operationally defined as nurses' perceived adequacy and impact of the nurse-to-patient staffing ratio in their haemodialysis units. Although the study located itself in the nurse-to-patient ratio used in haemodialysis practice, the variable did not include an independently substantiated, valuable number of nurses to patients for each of the included haemodialysis units. Rather, this variable spoke to participants' opinions on whether the current staffing model was sufficient to bring about safe and effective care, and how it impacted their workload, the care they were able to provide, and their job satisfaction.

The construct was measured using five items addressing: (1) perception of the current staffing ratio and the ability to provide safe and effective care, (2) perception of being overworked due to (a) high patient numbers, (b) low nursing staff, (c) ratios that are currently unsafe, (3) perception of current staffing numbers on the quality of care, (4) perception of the staffing ratio on the quality of care, (5) perception of the staffing ratio on job satisfaction. Each item was recorded on a five-point Likert scale.

Non-Clinical Task Burden

Non-clinical task burden was operationally defined as the extent to which nurses perceived that duties outside direct patient-care activities imposed additional demands on their work. These activities included administrative duties, paperwork, documentation, reporting, and other operational responsibilities that could reduce the time available for direct patient care.

The construct was measured using five items assessing: (1) the requirement to perform non-clinical or administrative duties during work shifts; (2) reduction in time available for patient care because of documentation and reporting responsibilities; (3) the perceived negative impact of non-clinical duties on job

satisfaction; (4) availability of administrative support to enable nurses to concentrate on patient care; and (5) adequacy of training and resources for managing non-clinical duties efficiently. Responses were recorded using the five-point Likert scale.

Workload

Workload was operationally defined as nurses' perceived intensity and manageability of their overall work demands within the haemodialysis setting, including demands associated with staffing levels and their perceived physical and psychological consequences. In the conceptual model, workload was examined as a potential mechanism through which staffing conditions could influence job satisfaction.

Workload was measured using five items addressing: (1) perceived manageability of the current workload; (2) effects of overall workload on mental and physical well-being; (3) perception of excessive workload relative to staffing levels; (4) confidence in meeting patients' needs despite the workload; and (5) perceived workplace stress attributable to insufficient staffing or excessive workload. Each item was rated using the five-point Likert scale.

Job Satisfaction

Job satisfaction was operationally defined as nurses' overall evaluation of their employment experience within their current private haemodialysis centre. The construct encompassed general satisfaction with the job as well as perceptions of organisational appreciation, supervisory support, work-life balance, professional contribution, intention to remain employed, professional development, and work-related stress.

Job satisfaction was measured using nine items assessing: (1) overall satisfaction with the current job; (2) feeling valued by the employer; (3) perception that one's work contributes positively to patient outcomes and well-being; (4) satisfaction with supervisory support; (5) satisfaction with work-life balance; (6) experience of job-related stress or burnout; (7) intention to remain in the current job for the following 12 months; (8) perceived impact of staffing ratios and workload on job satisfaction; and (9) satisfaction with opportunities for professional development. Responses were recorded using the five-point Likert scale.

These measures therefore represented respondents' self-reported perceptions and experiences rather than independently observed staffing levels, time-and-motion measurements of workload, or objectively recorded non-clinical working hours. The use of multi-item measures enabled the principal constructs to be evaluated across several dimensions relevant to nurses' working experiences in private haemodialysis centres. Internal consistency of the constructs was subsequently assessed using Cronbach's alpha as described in Section 4.5.

Pilot Testing and Reliability Assessment

Prior to completing data collection, a pilot study was performed to assess the clarity of the instruments, as well as the internal consistency and construct reliability.

Reliability was assessed using Cronbach's alpha coefficients.

The analysis showed that across all constructs, internal consistency was acceptable:

Construct	Cronbach's Alpha
Work Environment	0.809
Staffing Ratios	0.745
Non-Clinical Tasks	0.806
Job Satisfaction	0.837
Workload	0.746

Reliability coefficients being greater than 0.70 indicates that all measurements can be analysed using

inferential statistics.

The instruments in this study had good stability for use as a tool in the study to investigate organization factors of the nurse satisfaction within the coding framework.

Data Collection Procedure

Before data collection, permission to distribute the questionnaire was sought from the private haemodialysis centres involved. The participant information and questionnaire were sent to the eligible nurses via an online link from Google Form.

The participant information provided information on the purpose of the study, the voluntary nature of participation, confidentiality and anonymity of responses, and the right for the participant to discontinue participation. The respondents who agreed to participate each filled out the questionnaire and entered their answers anonymously via the online form.

This was done to encourage involvement of geographically spread haemodialysis centres and to reduce direct researcher influence on the responses.

Ethical Considerations

Institutional research ethics committee approval for this study was not sought. Hence there is no institutional ethics approval number and the study should not be read as approved formally or exempted by ethics.

However, measures for the protection of participants were built into the process of data collection. The participation was voluntary and the potential participants informed about what the study was about before completing the questionnaire. Participants were told the following: Their responses would be kept confidential and anonymous, and they were told they could end their participation. A self-administered, online questionnaire was used to collect data.

The current study has some methodological and governance limitations, including the lack of formal ethical review. Measures were put in place to ensure voluntary participation, confidentiality and anonymity but they do not replace independent ethical review. Independent assessment of the study protocol, procedures used to inform participants, data-management arrangements and safeguards of participants would have been provided during the formal review.

The findings should, therefore, be interpreted in view of this limitation. In future, when working with healthcare workers, it is recommended that the study obtain the necessary consent, exemption or other formal determination, as appropriate, from the relevant institutional research ethics committee prior to recruiting participants and collecting data.

Data Analysis Procedure

Data were coded and analysed with the SPSS software IBM SPSS Statistics.

The statistical analyses consisted of:

Descriptive Statistics

Used to communicate respondent characteristics and variable distributions.

Pearson Correlation Analysis

Used to study bivariate relationships of staffing ratio perception, non-clinical workload, workload, and job satisfaction.

Multiple Regression Analysis

Used to examine the different kinds of relationships among the organisational variables and job satisfaction.

Mediation Analysis

Conducted to see if workload serves as an indirect mediator between staffing ratio and job satisfaction, using the PROCESS Macro and bootstrapping.

The mediation effect was considered significant if the bootstrap confidence intervals were zero.

Moderation Analysis

Using PROCESS interaction modeling, the work environment was tested to see if it modified the staffing ratio and job satisfaction relationship.

It was considered significant moderation if the interaction-term was significant and the confidence intervals did not include zero.

RESULTS

Reliability Analysis

Prior to inferential testing, the stability of measurement across the study constructs was evaluated through an analysis of Cronbach's alpha coefficients to assess the reliability of internal consistency.

The analyses showed acceptable to strong internal consistency. As such, all constructs had a reliability coefficient of at least $\alpha = 0.70$, which indicated that there were no issues with the psychometric reliability of the constructs and that they were ready for the next level of analysis.

Of the remaining constructs, the strongest reliability coefficient was found for the Job Satisfaction construct ($\alpha = 0.837$), indicating strong internal consistency for the items that pertain to job satisfaction.

Constructs of Work Environment ($\alpha = 0.809$) and Non-Clinical Tasks ($\alpha = 0.806$) also demonstrated strong reliability.

The remaining constructs of staffing ratios perception ($\alpha = 0.745$) and workload ($\alpha = 0.746$) demonstrated acceptable reliability for the purpose of conducting exploratory behavioral research.

The results of the analyses of the measurement instrument supported the conclusion that there was sufficient internal consistency to conduct hypothesis testing and inferential statistical analyses.

Table 5.1 Reliability Coefficients

Construct	Number of Items	Cronbach's Alpha
Work Environment	6	0.809
Staffing Ratios	5	0.745
Non-Clinical Tasks	5	0.806
Job Satisfaction	9	0.837
Workload	5	0.746

The reliability outcomes provide confidence that subsequent analyses accurately reflect respondent perceptions of workplace organizational factors and satisfaction outcomes.

Pearson Correlation Analysis

Pearson correlation analysis was performed to examine the bivariate relationships between staffing ratio perception, non-clinical task scores, and job satisfaction. All three correlations were positive and statistically significant at the 0.01 level.

The strongest relationship was observed between staffing ratio perception and non-clinical tasks ($r = .816$, $p < .01$), indicating a strong positive association between the two composite measures. Specifically, higher scores on the staffing-ratio measure were associated with higher scores on the non-clinical-task measure. The previously stated interpretation that a decrease in staffing ratio was associated with an increase in non-clinical tasks was not supported by the positive direction of the observed correlation and has therefore been corrected.

A significant positive correlation was also observed between Non-Clinical Tasks and Job Satisfaction ($r = .642$, $p < .01$), while staffing ratio perception was positively correlated with Job Satisfaction ($r = .635$, $p < .01$). These findings indicate statistically significant associations among the measured constructs. However, because the analysis is correlational and based on cross-sectional self-reported data, the coefficients should not be interpreted as demonstrating causal relationships.

Table 5.2 Correlation Analysis

Variable	Staffing Ratio	Non-Clinical Tasks	Job Satisfaction
Staffing Ratio	1	.816**	.635**
Non-Clinical Tasks	.816**	1	.642**
Job Satisfaction	.635**	.642**	1

Note. $p < .01$.

The particularly strong correlation between Staffing Ratio perception and Non-Clinical Tasks ($r = .816$) indicates substantial overlap or close association between respondents' perceptions of these two aspects of their working conditions. This strong association should therefore be considered when interpreting subsequent multivariable analyses in which both constructs are included simultaneously.

Multiple Regression Analysis

A multiple linear regression analysis was conducted to examine the simultaneous contribution of work environment, staffing ratio perception, and non-clinical task scores to job satisfaction.

The overall regression model was statistically significant, $F(3, 137) = 37.952$, $p < .001$, with $R^2 = .454$ and adjusted $R^2 = .442$. Thus, approximately 45.4% of the variance in job satisfaction was accounted for collectively by work environment, staffing ratio perception, and non-clinical tasks.

Among the individual predictors, Non-Clinical Tasks was the only statistically significant unique predictor of job satisfaction ($B = 0.317$, $SE = 0.122$, $\beta = .315$, $t = 2.592$, $p = .011$, 95% CI [0.076, 0.558]). Staffing Ratio perception showed a positive but non-significant association after adjustment for the other predictors ($B = 0.293$, $SE = 0.154$, $\beta = .251$, $t = 1.896$, $p = .060$, 95% CI [-0.011, 0.597]). Work Environment was also not a statistically significant unique predictor ($B = 0.159$, $SE = 0.148$, $\beta = .148$, $t = 1.076$, $p = .284$, 95% CI [-0.134, 0.452]).

These findings indicate that the predictors collectively explained a substantial proportion of variability in job satisfaction, although only the non-clinical-task measure made a statistically significant unique contribution when the three predictors were entered simultaneously.

Table 5.3 Multiple Regression Predicting Job Satisfaction

Predictor	B	SE	β	t	p	95% CI for B
Constant	0.859	0.315	—	2.727	0.007	[0.236, 1.482]
Work Environment	0.159	0.148	0.148	1.076	0.284	[-0.134, 0.452]
Staffing Ratio	0.293	0.154	0.251	1.896	0.06	[-0.011, 0.597]
Non-Clinical Tasks	0.317	0.122	0.315	2.592	0.011	[0.076, 0.558]

Model fit: $R^2 = .454$; Adjusted $R^2 = .442$; $F(3, 137) = 37.952$, $p < .001$.

Mediation Analysis

A mediation analysis was conducted using PROCESS Model 4 to examine whether perceived workload statistically mediated the relationship between Non-Clinical Tasks and Job Satisfaction.

The total effect of Non-Clinical Tasks on Job Satisfaction was statistically significant ($c = 0.6468$, $SE = 0.0655$, $t = 9.88$, $p < .001$, 95% CI [0.5174, 0.7763]). After Workload was included as the mediator, the direct effect of Non-Clinical Tasks on Job Satisfaction was reduced and was no longer statistically significant ($c' = 0.1334$, $SE = 0.0872$, $t = 1.53$, $p = .1283$, 95% CI [-0.0390, 0.3058]).

The indirect effect of Non-Clinical Tasks on Job Satisfaction through Workload was 0.5134 (bootstrapped $SE = 0.0802$), with a 95% bootstrap confidence interval of [0.3771, 0.6879]. As the confidence interval did not include zero, the indirect effect was statistically significant.

These findings are consistent with full statistical mediation in the fitted model, whereby the relationship between Non-Clinical Tasks and Job Satisfaction was statistically accounted for through Workload. Given the cross-sectional design of the study, however, this finding should be interpreted as evidence of a statistical indirect association rather than proof of a causal or temporal mediation pathway.

Table 5.4 Mediation Analysis

Effect	Estimate	SE	t	p	95% CI
Total effect (c)	0.6468	0.0655	9.88	< .001	[0.5174, 0.7763]
Direct effect (c')	0.1334	0.0872	1.53	0.1283	[-0.0390, 0.3058]
Indirect effect via Workload	0.5134	0.0802	—	—	[0.3771, 0.6879]

Note. Statistical significance of the indirect effect was determined using the bootstrapped 95% confidence interval. An indirect effect was considered statistically significant when the confidence interval did not include zero.

Moderation Analysis

A moderation analysis was conducted using PROCESS Model 1 to examine whether Work Environment modified the association between Staffing Ratio and Job Satisfaction.

The conditional regression coefficient for staffing ratio perception was statistically significant ($b = 0.9309$, $SE = 0.4387$, $t = 2.1219$, $p = .0356$, 95% CI [0.0634, 1.7984]). The coefficient for Work Environment did not reach the conventional .05 level of statistical significance ($b = 0.7929$, $SE = 0.4145$, $t = 1.9130$, $p = .0578$, 95% CI [-0.0267, 1.6124]).

Most importantly, the staffing ratio perception $\times$ Work Environment interaction was not statistically significant ($b = -0.1236$, $SE = 0.1035$, $t = -1.1937$, $p = .2347$, 95% CI [-0.3282, 0.0811]). The confidence interval for the interaction coefficient included zero, providing no statistical evidence that the association

between staffing-ratio perception and job satisfaction differed according to the level of the work environment.

Therefore, the hypothesis that Work Environment moderated the relationship between Staffing Ratio and Job Satisfaction was not supported.

Table 5.5 Moderation Analysis

Predictor	b	SE	t	p	95% CI
Constant	-0.9459	1.5626	-0.6054	0.5459	[-4.0359, 2.1440]
Staffing Ratio	0.9309	0.4387	2.1219	0.0356	[0.0634, 1.7984]
Work Environment	0.7929	0.4145	1.913	0.0578	[-0.0267, 1.6124]
Staffing Ratio × Work Environment	-0.1236	0.1035	-1.1937	0.2347	[-0.3282, 0.0811]

Hypothesis Testing Summary

Table 5.6 Hypothesis Testing Outcomes

Hypothesis	Result
H1	Partially Supported
H2	Supported
H3	Supported (Full Mediation)
H4	Excluded Following Model Refinement
H5	Not Supported

The results suggest that the main pathway through which staffing pressure links to nurse satisfaction is through workload. The strongest direct effect was seen from the non-clinical task burden.

This study provides an important empirical contribution by demonstrating that perceived workload is closely associated with job satisfaction within the organizational context examined.

DISCUSSION

This study examined the relationships among staffing-ratio perception, non-clinical task burden, workload, work environment, and job satisfaction among registered renal post-basic nurses working in private haemodialysis centres in Sarawak. The findings broadly support previous evidence that organizational working conditions are closely related to nurses' assessments of their work experience, while also providing several findings that are specific to the private haemodialysis context.

The present results are particularly relevant because much of the existing nursing workforce literature has focused on general hospital populations, whereas evidence involving renal-trained nurses working in privately managed haemodialysis centres in East Malaysia remains limited. The current study therefore extends existing evidence into a specialised clinical environment in which nurses must combine prolonged technical patient monitoring with organizational and operational responsibilities. This context is important when interpreting the relative contribution of staffing, non-clinical work, workload, and organizational support.

Non-Clinical Task Burden and Job Satisfaction

Non-clinical task burden emerged as the only statistically significant unique predictor of job satisfaction after work environment and staffing-ratio perception were considered simultaneously. This finding suggests

that the way operational and administrative responsibilities are distributed may be particularly relevant to nurses' reported job satisfaction in private haemodialysis practice.

The finding is consistent with the literature reviewed in this study concerning non-clinical workload and role contamination. Kutney-Lee et al. (2013) were cited in the literature review in relation to the diversion of nursing time away from direct clinical practice, while Lake et al. (2019) were discussed in relation to frustration and reduced organizational commitment associated with role contamination. The present findings are compatible with this body of evidence because the non-clinical task measure captured responsibilities such as documentation, administrative work, scheduling, stock coordination, equipment-related duties, and other operational support activities that may compete with direct patient-care responsibilities.

The result is also consistent with the broader organizational perspective provided by Herzberg's Two-Factor Theory. In this framework, organizational working conditions function as hygiene factors that are closely related to employee dissatisfaction when they are perceived as inadequate. The present findings suggest that, within private haemodialysis practice, non-clinical task allocation may represent an important component of these working conditions.

An important contribution of the present study is that the association with non-clinical tasks remained statistically significant when staffing-ratio perception and work environment were entered into the same regression model. Previous nursing research has frequently emphasized staffing adequacy as a major workforce concern. For example, Aiken et al. (2002) and Aiken et al. (2014) were cited in this study in relation to associations among staffing conditions, workload, burnout, job dissatisfaction, and intention to leave. Current results do not rule out the relevance of staffing but do indicate that staffing perhaps cannot entirely capture the day-to-day organisational burden of nursing. The rate of use of nursing time by the nurse, and how much of this is spent on other than patient care, may also be significant.

This could be especially relevant in haemodialysis (HD) where the renal nurse needs to be attentive to the vascular access, dialysis machine, therapies, and complications involved for long periods of time. In a technically high-demand environment like this, competing operational activities may be perceived in a different way from the same type of administrative activities in other, less procedure intensive nursing settings. The present findings thus supports the earlier evidence on non-clinical workload as being applicable in the Sarawak private haemodialysis centres.

Because this study was cross-sectional, these findings should be interpreted as associations rather than evidence that non-clinical tasks cause changes in job satisfaction. Nevertheless, the consistency between the current results and previous evidence on role overload and non-clinical work supports further investigation of task allocation in specialised renal nursing.

Workload as a Statistical Mediator of the Association Between Non-Clinical Tasks and Job Satisfaction

The mediation analysis showed a statistically significant indirect association between non-clinical task burden and job satisfaction through perceived workload. The total association between non-clinical tasks and job satisfaction was statistically significant, whereas the direct association was no longer statistically significant after workload was included in the model. The bootstrapped indirect effect was also statistically significant.

This is in line with the literature analysis on the Job Demands-Resources thesis. Bakker and Demerouti (2007) theorized that workload is a key job demand that can be a 'user of psychological and occupational resources' if demands do not match capacities. In the context of the theoretical orientation it is possible to argue that the present statistical mediation is consistent with the concept that non-clinical responsibilities and perceived workload are tightly linked aspects of nurses' work experience.

The finding also adds value to previous nursing evidence with regard to the implementing of workload as an intermediate organisational mechanism. With respect to the mediating role of workload between

organisational conditions and nursing outcomes, Van Bogaert et al. (2014) were referenced in the literature review. The type of predictor investigated in the current mediation model was non-clinical task burden, not staffing adequacy, but the current findings resemble earlier findings in suggesting that workload could prove to be a mediator between organisational work demands and job satisfaction.

This one is significant. Past research frequently has associated a shortage of staff with increased workload and decreased workforce outcomes. The current research indicates that workload is another factor that might be important in explaining the relationship between non-clinical duties and satisfaction. That is, workload could be a function of the number of patients or the number of nurses – or the sum of the duties imposed on nurses in clinical, administrative, logistical or operational roles.

This is particularly so in haemodialysis where the nurse is required to monitor the patient and carry out various highly structured clinical tasks. Respondents' perceptions of workload generally, however, may therefore be affected by additional non-clinical duties, even if the number of staff alone does not clearly relate to job satisfaction.

Mediation finding should however be interpreted carefully. The timing of assessment for non-clinical task burden, workload and job satisfaction means temporal relationships could not be inferred, such as non-clinical task burden is present prior to workload, and that workload is the cause of subsequent alterations to job satisfaction. The result represents a statistically significant indirect association that is consistent with the proposed theoretical model. Longitudinal research would be required to confirm the temporal ordering of these variables.

Staffing Ratio Perception and Job Satisfaction

Staffing-ratio perception was significantly correlated with job satisfaction at the bivariate level, although its unique contribution in the multiple regression model did not reach the conventional level of statistical significance after work environment and non-clinical tasks were included.

This pattern partly corresponds with previous nursing evidence. Aiken et al. (2002) and Aiken et al. (2014) found that a number of significant relationships between staffing conditions, nurse workload, burnout, job dissatisfaction, and workforce outcomes exist. These studies agree with the overall significance of staffing sufficiency in nursing practice.

The current regression results indicate, however, that when other organizational factors were analyzed at the same time, the link between staffing-ratio perception and job satisfaction could be a more complicated relationship. This sample showed a substantial unique contribution for non-clinical task burden to job satisfaction, while a unique contribution of staffing-ratio perception was not statistically significant after the adjustment.

One interpretation of this could be that staffing is tightly connected to other work organizational factors and is not operating independently of these factors, in determining satisfaction. This is agreed with the highly significant relationship found in the present study between the staffing-ratio and the non-clinical-task measures. Findings thus do not suggest that the importance of staffing is not considered. Instead they argue that nurses experiences of staffing are not mutually exclusive with other operational factors, workload distribution and other duties beyond direct care of patients.

The present regression results may also indicate some setting and measurement differences with the more powerful staffing results found by some of the earlier researchers. The published literature on staffing has focused mainly on large hospital populations and objective nurse to patient staffing indicators, whereas the current study focused on staff's perception of staffing adequacy in specialised private haemodialysis centres. The current results are therefore considered a supplement to the general body of literature on staffing.

Work Environment and the Absence of a Moderating Effect

There was no significant interaction between staffing-ratio perception and work environment with job

satisfaction. Perceived Staffing Ratio did not differ in its association with job satisfaction across levels of measured work environment (no significant interaction between Staffing Ratio perception and Work Environment).

This discovery is interesting in contrast to some of the evidence reviewed previously. In regard to supportive nursing practice environments, there were citations to the importance of supportive nursing practice environments with relation to professional outcomes (Lake, 2002) and that organizational support can buffer against adverse workplace experiences (Laschinger & Leiter, 2006). Given this evidence it could be reasonably assumed that a supportive work environment would have been expected to diminish the link between staff pressure and job dissatisfaction.

The moderating relation was not shown with the present findings. However, this does not mean that the work environment is insignificant. Instead, it suggests that there was no statistically significant change in the relationship between the staffing-ratio perception and job satisfaction in this sample because of the work-environment measure.

This outcome might be explained by the well organised nature of haemodialysis work. Leadership, collaboration, communication and organization can have a positive impact on work overall, but not always to change the demands set on operational activities related to patient monitoring, patient treatment processes, the need for staffing or workload. This interpretation is in line with the ambiguity that was found in the literature review, in which supportive organizational environments have been suggested as buffers to occupational strain, and in which structural work demands may be relevant in supportive workplaces.

Without moderation then there is nuance added to the evidence that is out there. It implies that all types of operational pressure do not necessarily counterbalance the advantages of an "attractive" work area. Future research should explore if certain aspects of the work setting (e.g. supervisor support, teamwork, autonomy, administration support) buffers to a different extent in specialised renal nursing.

Overall Interpretation in Relation to Previous Evidence

The overall results are consistent with earlier studies of the nursing workforce identifying the association between organizational working conditions, workload, staffing, and role demands and job satisfaction. However, the relative importance of these factors in the present study differed from what might be expected from literature focused predominantly on hospital staffing.

The strongest unique statistical contribution came from non-clinical task burden, while perceived workload provided a significant indirect statistical link between non-clinical tasks and job satisfaction. Staffing-ratio perception remained associated with job satisfaction at the bivariate level but did not make a statistically significant unique contribution in the multivariable model. Work environment, although conceptually important in previous nursing literature, did not significantly moderate the staffing-satisfaction relationship.

These findings therefore extend rather than simply reproduce previous evidence. They suggest that in private haemodialysis centres, the organization and distribution of work may be at least as relevant as staffing numbers alone. This is particularly important in a specialised setting where clinical work requires prolonged technical attention and where nurses may also undertake administrative and operational responsibilities.

At the same time, the findings should not be interpreted as establishing causal relationships because of the cross-sectional design. Rather, they identify a pattern of associations that is broadly compatible with established nursing workforce theory and previous empirical evidence, while highlighting areas that warrant longitudinal and intervention-based investigation in private haemodialysis practice.

SUMMARY OF FINDINGS

Overall, the findings suggest that job satisfaction among private haemodialysis nurses is associated with the organization of work and operational demands, rather than with staffing considerations alone.

Among other things, the results show that the greatest direct influence is from the burden of non-clinical tasks, and that workload statistically mediated the association between non-clinical task burden and job satisfaction.

Improving the work environment is also beneficial but does not alleviate the structural workload pressures.

These results show that to continue to have specialised renal nursing services, task redesign should be prioritized to redistribute operational tasks.

IMPLICATIONS FOR PRACTICE AND POLICY

This study's results are valuable to healthcare administrators, private haemodialysis service providers, workforce planners, and healthcare policymakers interested in increasing satisfaction and sustaining the renal care nurse workforce.

The results show that, in the case of nurses working in private haemodialysis settings, satisfaction is not measured by the sufficient staffing ratio, as an isolated structural variable, but rather by the operational workload consequences of staffing strain, where the task burden is exceeded and roles are contaminated.

This is significant because it means that to increase satisfaction, the number of nurses is not the only variable that needs to be considered; the staffing structure must also be considered in relation to the operational workload.

Operational Task Redistribution and Role Preservation

The best direct indicator of nurse dissatisfaction in this study was non-clinical task burden.

This result indicates that all private haemodialysis centres should analyse how they allocate tasks and see where they can do administrative task shifting.

In most private dialysis centres, nurses who perform many clerical tasks, along with inventory control, scheduling, and capital stock management, and who also must manage equipment and oversee the dialysis centre's operations and housekeeping, are common.

Managing all these tasks makes it difficult for nurses to know what their true role is as a nurse and what their clinical focus should be.

It is important for healthcare administrators to focus on designing task redistribution models to ensure that nurses maintain their role identity as care providers.

This may include hiring more administrative support staff, centralizing clerical tasks, having an operations manager manage inventory, using technology to automate or simplify documentation, and, where it is safe to do so, designing a task-work flow for equipment that the nurse would then prepare.

It is likely that focusing on patient care rather than supporting care would increase nurse satisfaction and reinforce their professional identity.

In renal nursing, where the tasks are very technologically intensive, it is important to focus on reinforcing professional identity to maintain interest and prevent burnout.

Workload-Sensitive Staffing Models

The mediation findings show that satisfaction is mainly dependent on workload, with staffing ratio perception affecting it indirectly.

It therefore implies that in order to carry out workforce planning, it is sometimes necessary to deviate from the benchmarks based on numbers.

For private haemodialysis providers, staffing structures should transcend setting nurse to patient ratios and consider factors such as:

- The frequency of dialysis sessions that need to be completed
- Sharpness of patients' vision
- The risk of vascular access
- The ease or difficulty of treating the animals
- How much the equipment used needs to be set up and prepared
- The level of complexity of the documentation
- The extent of the "extra" work for staff.

A target staffing number can be set, but it may not represent the true demand of the situation if there is a large difference in workload among the different dialysis centres.

Therefore, to represent true demand and be more flexible, management should use a staffing framework that uses workload indicators to determine how staffed procedures should be scheduled.

This will free up more staff to be deployed at the right time and place, especially in a big and widely spread health care system such as Sarawak.

Workflow Redesign as a Strategic Workforce Retention Tool

One of the major practical implications is that improving the process work flow may be one of the means of boosting workers' satisfaction, if increasing the number of workers is not possible financially or logistically.

Private renal service providers in a higher-volume and lower cost environment is definitely the situation.

The outcome of the studies suggests that managers are responsible for improving inefficiency of their work process to reduce workload amplification.

Examples of such redesigns may include:

- uniform dialysis preparation procedures;
- use of digital checklists;
- Automatic Consumer Inventories System to predict the dialysis consumables inventory;
- automated patient scheduling;
- A centralized maintenance request reporting system;
- Better integration of documentation systems.

These redesigns can help reduce the negative effects on the team and staff from the dialysis workflow and enhance the continuity of the dialysis service.

From a cost-benefit analysis, redesigning the workflow is a more viable option to retain staff than an immediate expansion of the workforce.

This is more applicable to the smaller private centres that have fewer staffing options.

Leadership Development Beyond Cultural Support

The work environment slightly influenced independent contributions but couldn't fully account for the Moderation of staffing-related workload strain.

This implies that the presence of a good organisational culture cannot completely eliminate the effects of structural operational pressures.

As such, the leadership of private haemodialysis centres needs to move past generic employee engagement

strategies. They need to develop a culturally informed approach to leadership that is grounded in operational strategies.

Renal nursing leadership needs to develop the ability to:

- monitor and allocate work obligation
- prioritize tasks
- project staffing demands
- assess risk
- manage operational disruption
- be tactical in the control of workflow.

Leadership training must create the ability to recognize workload strain to intervene before it leads to dissatisfaction.

This operating leadership model may have a greater impact than the conventional culture models that focus on morale.

Policy-Level Workforce Planning for Specialised Renal Care

With regard to healthcare policy, the findings suggest that the planning of the renal workforce should move beyond the limitations of traditional headcount approaches to workforce planning.

Regulatory bodies and healthcare planners should be encouraged to implement workload-adjusted workforce standards for private haemodialysis centres.

This may happen through the creation of policy directives that contain:

- workload-adjusted staffing thresholds
- mandatory task allocation audits
- benchmarks for administrative support
- dialysis staffing metrics based on complexity
- frameworks to monitor workforce strain

This would allow for the planning of private renal services workforce sustainability based on evidence.

For healthcare systems like those found in Sarawak, where the dispersion of service limits workforce growth, workload-based regulations would be a better approach to the straightforward Headcount-based regulations for a certain period.

Implications for Long-Term Renal Service Sustainability

Private haemodialysis services rely on keeping experienced renal post-basic nurses.

Renal nursing is a specialist area of nursing that requires specific expertise that can only be developed over time and through clinical practice.

They are constantly challenged by high nurse turnover rates, which puts their patients at risk and negatively impacts their service.

Their studies show that to keep their nurses, they should focus on more than just the general work climate and pay. They should keep the integrity of the clinical roles and reduce nurse workloads.

Below are some tips on lowering task contamination, which will help keep a renal nurse for longer.

This is essential for enhancing renal nursing services in the region, as it aims to prevent task contamination of renal nursing and preserve healthcare roles for renal nurses.

Strategic Healthcare System Contribution

In this study, work dissatisfaction is reframed as a systems management problem in a healthcare organisation, not a psychological wellbeing problem.

As the key driver for staff retention, healthcare organizations will be incentivized from this angle to design and develop improved structures for workflow and task architecture.

Healthcare systems can better craft targeted and sustainable workforce interventions by better understanding the two key sources of dissatisfaction: workload transmission and role contamination.

This approach provides a long overdue strategic shift in the management of the specialised healthcare workforce.

Summary of Practical and Policy Implications

The results show that changing staffing levels or general attempts to improve morale in private haemodialysis centres will not increase nurse satisfaction.

More effective approaches will include:

- Preserving task-roles
- Using a workload-based staffing model
- Redesigning workflow
- Using operational leadership
- Using evidence to regulate the workforce
- Using specialised retention strategies

Taken together, these approaches will allow private haemodialysis centres to retain their specialised renal nursing staff and improve the stability of their private healthcare services.

LIMITATIONS AND FUTURE RESEARCH

While this study provides valuable data on the factors that impact the job satisfaction of registered renal post-basic nurses in private haemodialysis centres in Sarawak, some limits of the study need to be considered when considering the results.

Acknowledging the limits of the study allows for the best positioning of the results and provides the basis for future research.

Cross-Sectional Design

This study used a cross-sectional research design to capture respondent perceptions at a single point in time.

This design is popular in healthcare workforce research and is useful for analyzing predictors among organizational variables; however, it does not support the drawing of strong causal conclusions.

While there is strong evidence from the mediation analysis of it being possible to explain the outcomes through the pathways identified, the absence of long-term data makes it impossible to draw conclusions about causality.

It is possible that within the organization, perceptions of things like too much work and not enough time to do it, as well as job satisfaction, can change because of restructuring, staff changes, or other policy changes within the organization as well as changes in the healthcare system.

Studies following a longitudinal panel design would be able to draw stronger conclusions about causation and would add to this study by shedding light on the stability of the relationships that have been identified.

Reliance on Self-Reported Perceptual Measures

This study used self-administered questionnaires only.

Self-report measures are useful for gauging feelings about the workplace like satisfaction and the strains associated with the work and the support provided by the organization. However, self-report measures can lead to response bias.

There are many reasons why participants may overreport or underreport their workplace experiences. It could be because of social desirability, where they report what they think is acceptable, it could be because of loyalty to the organization, or it could be because of how they are feeling at the moment they are reporting.

The researchers tried to mitigate some of this bias by allowing participants to remain anonymous, but there will always be some subjective variability when using self-report measures.

To gain more valid measures, the researchers suggest integrating some objective measures such as:

- Actual nurse-to-patient staffing logs
- Records of dialysis session workloads
- Absenteeism and overtime rates
- Turnover rates
- Duration of administrative tasks

Using both perceptual and objective data would help better understand the specialised renal care workplace satisfaction and its associated factors.

Geographic Contextual Limitation

The study was conducted only in private haemodialysis centres in Sarawak.

This focuses on one region and adds important workforce research to East Malaysia.

That said, the results cannot be extended to

- public sector dialysis centres;
- tertiary hospital renal units;
- urban private centres in Peninsular Malaysia;
- different haemodialysis systems internationally with different regulations and operations.

Sarawak's geography with challenges of access to healthcare, distribution of the workforce, and the logistics of service delivery may create circumstances that are different from more centralized healthcare systems.

The results of this research will be most helpful in private haemodialysis centres in Sarawak. Future studies that cover more regions of Malaysia and compare different sectors of Malaysia's healthcare system will help determine how useful the results of this research will be outside of Malaysia.

Comparing different countries will help identify how different regional healthcare systems create satisfaction among specialised nurses.

Model Refinement and Exclusion of Burnout Mediation

Burnout was originally defined as a parallel mediating variable from the relationship between work-related stress and job dissatisfaction.

There were statistical issues with multicollinearity and conceptual overlap with workload measures.

To maintain clarity and avoid redundancy in the analysis, the median of burnout was excluded from the final hypothesis tests.

Although this improved the model's precision, it prevented the examination of psychological exhaustion as a separate case.

It is recommended that burnout be studied again with workload measures that can distinguish emotional exhaustion from other factors.

This would allow for the testing of burnout within the context of renal nursing dissatisfaction pathways and for the testing of other sequences that may be related to burnout within specialty nursing.

It may also help to advance the thinking about the upper limits of what can be theoretically explained about the pressures of modern nursing.

Potential Organizational Heterogeneity Across Centres

The study surveyed 25 private haemodialysis centres, which increased representation in the regional renal care workforce.

There could be varying degrees of organizational heterogeneity between the centres, which could have influenced respondent perceptions in ways that the statistical model could not account for.

Different forms of

- management style
- ownership
- staffing culture
- patient case mix
- technology
- operational maturity

could create different satisfaction levels among facilities.

Subsequent studies could use modern forms of analysis that incorporate varying levels of organizational structures within centres to see if there are aspects of institutional form that clarify or moderate workforce satisfaction.

This would help clarify how different organizations create different types of pressure within private renal care structures.

Limited Examination of Broader Psychological and Professional Factors

This study considered structural organizational determinants of satisfaction such as staffing ratio, workload, non-clinical burden, and the work environment.

Other relevant operational predictors have not been considered.

Some possible omitted variables are:

- Professional autonomy
- Trust in leadership
- Resilience
- Opportunity for advancement
- Satisfaction with compensation
- Exposure to emotional labor
- Recognition for professional work
- Differences in coping styles

Subsequent research is encouraged to consider these and other constructs of broader organisational and psychological nature to create more complete satisfaction theories for specialised nurses.

This would permit more adequate theoretical understanding with current frameworks of occupational wellbeing.

Absence of Formal Ethical Review

An important limitation of this study is that formal ethical approval was not obtained from an institutional research ethics committee before data collection. Although participation was voluntary and measures were taken to maintain confidentiality and anonymity, these procedural safeguards do not constitute or replace independent ethical review.

The absence of formal ethical review means that the study protocol and participant-protection procedures did not undergo prospective independent assessment by an ethics committee. This represents an important research-governance limitation and may also affect the acceptability of the study for publication in journals or other settings that require documented prospective ethical approval.

Future research should obtain prospective ethical approval, exemption, or other appropriate formal determination from the relevant institutional research ethics committee before recruitment and data collection.

FUTURE RESEARCH DIRECTIONS

From the current study, several important research opportunities can be identified.

First, it would be important to study if there are long-term adaptations to workload in specialist renal nursing. This would allow us to understand if there are cumulative effects of repeated staffing pressure, or if there is adaptive resilience in this case.

Second, it would be important to study if there are differences in task-role contamination and workload diffusion in both private and public haemodialysis centres.

Third, if we want to understand how nursing staff interprets their non-clinical burden and their professional role, we should conduct in-depth interviews.

Fourth, if we want to implement changes in the healthcare system, we should study the effects of redesigning workflows and if we redistribute clerical tasks and adjust staffing levels.

Last, we should study if digital systems that automate work processes in nursing can remove non-clinical tasks and increase retention of renal nursing staff.

This type of research has the potential to directly improve the automation of nursing tasks and the healthcare systems in which we work.

CONCLUSION

This study identified significant relationships among organisational working conditions, perceived workload, and job satisfaction among registered renal post-basic nurses working in private haemodialysis centres in Sarawak.

Non-clinical task burden was the only statistically significant unique predictor of job satisfaction in the multivariable regression model. In addition, workload statistically mediated the association between non-clinical task burden and job satisfaction, whereas work environment did not significantly moderate the association between staffing-ratio perception and job satisfaction.

These findings suggest that non-clinical responsibilities and perceived workload are important organisational factors associated with nurses' reported job satisfaction in specialised private haemodialysis settings. They may therefore provide useful considerations for workforce planning, task allocation, administrative support, and future interventions.

Because the study was cross-sectional, no causal or temporal conclusions can be drawn from these associations. Further longitudinal and intervention-based studies are required to determine whether changes in non-clinical task allocation or workload are followed by corresponding changes in nurse job satisfaction or workforce retention.

Ethical Approval

Formal ethical approval from an institutional research ethics committee was not obtained for this study. Participation was voluntary, and participants were provided with information regarding the purpose of the study before completing the questionnaire. Responses were collected anonymously and treated confidentially, and participants were informed of their right to discontinue participation. The absence of formal ethical approval is acknowledged as a research-governance limitation of this study and is further addressed in the Limitations section.

Conflict of Interest

The author declares that there is no conflict of interest associated with this study.

Disclosure / Author Note

This manuscript is an analysis of the author's Master of Business Administration capstone research project at Saito University College. The data has been restructured and re-analysed for the purposes of regulation and healthcare governance.

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