http://dx.doi.org/10.18623/rvd.v23.5711

BEYOND AVERAGE EFFECTS: STRUCTURAL HETEROGENEITY IN ORGANIZATIONAL COMMITMENT AMONG FEMALE HEALTHCARE WORKERS IN PUBLIC HOSPITALS

ALÉM DOS EFEITOS MÉDIOS: HETEROGENEIDADE ESTRUTURAL NO COMPROMISSO ORGANIZACIONAL ENTRE PROFISSIONAIS DE SAÚDE DO SEXO FEMININO EM HOSPITAIS PÚBLICOS

Article received on: 12/8/2025
Article accepted on: 3/6/2026

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The authors declare that there is no conflict of interest

Abstract
This study examines whether the drivers of organizational commitment operate uniformly across subgroups of female healthcare workers in public hospitals in Vietnam's Mekong Delta, addressing the common assumption of structural homogeneity in prior research. Using survey data from 695 employees across four provincial hospitals, the study applies Partial Least Squares Structural Equation Modeling (PLS-SEM), followed by measurement invariance testing (MICOM) and multi-group analysis (PLS-MGA and permutation tests). The results indicate that organizational commitment is not shaped by a single universal mechanism; instead, the effects of HRM resources (benefits, promotion opportunities, working conditions, and work environment) and work–family dynamics vary across groups defined by parental status, dependent responsibility, night-shift status, age, occupational roles, and hospital affiliations. In contrast, the relationship between job satisfaction and organizational commitment remains relatively stable, suggesting a common attitudinal core. These findings support a layered view of organizational commitment, in which a stable core coexists with context-dependent structural pathways, and contribute to the literature by highlighting structural heterogeneity in public healthcare settings. Practically, the

Resumo
Este estudo examina se os fatores que determinam o comprometimento organizacional atuam de maneira uniforme entre os subgrupos de profissionais de saúde do sexo feminino em hospitais públicos do Delta do Mekong, no Vietnã, questionando a suposição comum de homogeneidade estrutural presente em pesquisas anteriores. Utilizando dados de pesquisa de 695 funcionárias em quatro hospitais provinciais, o estudo aplica a Modelagem de Equações Estruturais por Mínimos Quadrados Parciais (PLS-SEM), seguida por testes de invariância de medida (MICOM) e análise multigrupo (PLS-MGA e testes de permutação). Os resultados indicam que o comprometimento organizacional não é moldado por um único mecanismo universal; em vez disso, os efeitos dos recursos de gestão de recursos humanos (benefícios, oportunidades de promoção, condições de trabalho e ambiente de trabalho) e da dinâmica trabalho-família variam entre os grupos definidos por status parental, responsabilidade por dependentes, status de turno noturno, idade, funções ocupacionais e afiliações hospitalares. Em contrapartida, a relação entre satisfação no trabalho e comprometimento organizacional permanece relativamente estável, sugerindo um núcleo atitudinal comum. Essas descobertas

results underscore the need for segment-specific HR strategies, including family-supportive policies, flexible scheduling, and differentiated resource allocation to enhance employee commitment in resource-constrained public hospitals.

Keywords: Multi-Group Analysis (MGA). Organizational Commitment. Female Healthcare Workers. Work-Family Dynamics. Public Hospitals.

apoiam uma visão em camadas do comprometimento organizacional, na qual um núcleo estável coexiste com caminhos estruturais dependentes do contexto, e contribuem para a literatura ao destacar a heterogeneidade estrutural em ambientes de saúde pública. Na prática, os resultados ressaltam a necessidade de estratégias de RH específicas para cada segmento, incluindo políticas de apoio à família, horários flexíveis e alocação diferenciada de recursos para aumentar o comprometimento dos funcionários em hospitais públicos com recursos limitados.

Palavras-chave: *Análise Multigrupo (MGA). Compromisso Organizacional. Profissionais de Saúde do Sexo Feminino. Dinâmica Trabalho-Família. Hospitais Públicos.*

1 INTRODUCTION

Maintaining a committed healthcare workforce remains a persistent challenge for public health systems worldwide, particularly in labor-intensive settings where service quality depends heavily on human resources. Organizational commitment is widely recognized as a key driver of workforce stability, discretionary effort, and continuity of care (Allen & Meyer, 1990; Meyer & Smith, 2000). When healthcare professionals feel psychologically attached to their organizations, they are more likely to remain in their positions and sustain performance under demanding conditions. Conversely, weakened commitment is associated with higher turnover intentions, lower job performance, and reduced quality of patient care (Bisharat *et al*., 2016; Scanlan & Still, 2019).

These challenges are especially evident in public healthcare systems in emerging economies. In Vietnam, public hospitals operate under growing service demand while financial incentives and working conditions remain relatively constrained. At the same time, the rapid expansion of private healthcare providers has intensified competition for skilled medical professionals, encouraging the movement of healthcare workers from public to private facilities in recent years (Ministry of Health, 2023). The situation is particularly pronounced in the Mekong Delta region, where the availability of healthcare personnel remains below the national average, with approximately 7.6 physicians per

10,000 population compared with 9.8 nationally. Public hospitals in the region therefore face persistent difficulties in attracting and retaining qualified healthcare professionals.

Within this workforce, women constitute a substantial proportion of healthcare employees, particularly in nursing, midwifery, and allied health roles (WHO, 2016). However, female healthcare workers often face the dual demands of professional responsibilities and family caregiving expectations. In many Asian societies, gender norms continue to assign women a greater share of household and caregiving duties, increasing their exposure to work-family conflict and role strain (Greenhaus & Beutell, 1985; Shockley *et al*., 2017). In demanding healthcare environments characterized by long shifts, emotional labor, and high patient loads, these pressures may undermine work-life balance and job satisfaction, ultimately weakening organizational commitment.

Although prior research has identified several organizational and work–family determinants of commitment, most studies rely on single-sample structural models that implicitly assume homogeneous relationships across employees. In reality, employees differ in their career stages, caregiving responsibilities, occupational roles, and institutional contexts. Role theory suggests that individuals occupying different social roles experience distinct expectations and resource constraints (Kahn *et al*., 1964), while social exchange processes may operate differently depending on employees' needs and available support systems (Cropanzano & Mitchell, 2005). Consequently, the mechanisms linking HRM practices, work-family dynamics, well-being, and organizational commitment may vary across employee groups.

Despite these theoretical insights, empirical evidence on structural heterogeneity in organizational commitment remains limited, particularly in public healthcare settings in developing regions and among female employees. Multi-group analysis (MGA) provides a rigorous approach for examining whether structural relationships differ across subpopulations by testing whether path coefficients vary significantly between groups (Henseler *et al*., 2016; Sarstedt *et al*., 2011).

To address this gap, the present study adopts a multi-group perspective to examine whether the mechanisms underlying organizational commitment differ across key subgroups of female healthcare workers in public hospitals in the Mekong Delta, Vietnam. Using survey data from four provincial hospitals, the study estimates a PLS-SEM model and applies measurement invariance testing followed by multi-group

analysis. By moving beyond average effects and identifying subgroup-specific patterns, this research contributes to a more nuanced understanding of organizational commitment and provides practical insights for designing segment-sensitive HRM strategies in resource-constrained public healthcare systems.

2 LITERATURE REVIEW

2.1 Organizational commitment as a perception-based constructo

Organizational commitment refers to an employee's psychological attachment to the organization and their intention to maintain membership (Mowday *et al*., 1979). In healthcare settings, commitment is closely linked to workforce stability and service quality (Meyer & Smith, 2000; Scanlan & Still, 2019). However, research increasingly suggests that commitment is not determined solely by objective working conditions. Rather, it reflects how employees interpret organizational support and the demands they encounter in their daily work (Becker *et al*., 2018; Rhoades & Eisenberger, 2002).

For female healthcare workers, commitment is embedded in the interaction between professional and family roles. Work–family conflict has been shown to reduce job satisfaction and organizational commitment, particularly in high-pressure occupations such as healthcare (Geisler *et al*., 2019; Nohe & Sonntag, 2014). Conversely, supportive organizational practices and family resources can mitigate these effects and sustain positive work attitudes (Lapierre *et al*., 2018).

Importantly, these relationships may not operate uniformly across employees. Differences in caregiving responsibilities, career stages, and work arrangements may alter the salience of organizational resources and work–family dynamics, suggesting the need for a heterogeneity-oriented perspective.

From a social exchange perspective, employees reciprocate favorable treatment from the organization with positive attitudes and attachment. HR practices and supportive work environments therefore function as signals of organizational support that strengthen employees' commitment through reciprocal exchange processes (Cropanzano & Mitchell, 2005).

2.2 Structural heterogeneity across employee groups

Although organizational commitment has often been examined using single-sample models, employees rarely experience work conditions in the same way. Differences in role demands, resource availability, and career priorities may therefore lead to structural heterogeneity in the relationships linking HR practices, work-family dynamics, well-being, and commitment.

2.2.1 Life stage and family roles

Role theory suggests that individuals simultaneously occupy multiple social roles, and the relative importance of these roles often shifts across life stages (Kahn *et al*., 1964). Employees with children or dependent family members experience greater time - and strain-based conflict, which may increase their reliance on organizational support to maintain commitment (Shockley *et al*., 2017).

2.2.2 Work schedule

Night-shift work is associated with irregular hours, higher fatigue, and greater work–family interference, which can weaken well-being and organizational attachment (Booker *et al*., 2018; Wagstaff & Lie, 2011).

2.2.3 Age and career stage

Career stage influences employees' expectations and resource needs. Early-career employees tend to prioritize development opportunities and psychosocial work environments, whereas mid- and late-career employees place greater emphasis on stability and working conditions (Rudolph *et al*., 2018).

2.2.4 Occupational roles

Healthcare occupations vary substantially in autonomy, workload intensity, and emotional labor requirements. These differences may lead to variation in how organizational practices influence commitment across physicians, nurses, and technical staff (Blegen *et al*., 1998).

2.2.5 Institutional contexto

Public hospitals vary in resource availability, management practices, and organizational culture. As a result, employees may interpret organizational resources and support differently across hospital contexts (Addow *et al*., 2022).

2.3 Hypotheses development

Integrating these perspectives, organizational commitment can be understood as the outcome of two interacting mechanisms grounded in social exchange and resource-based frameworks. First, according to social exchange theory, positive work experiences-reflected in job satisfaction, translate into organizational attachment through reciprocal exchange processes. Second, COR and the JD-R framework suggest that the effectiveness of organizational resources and the impact of work-family demands depend on employees' resource constraints and job demands. Because these constraints differ across life stages, caregiving roles, work schedules, occupational positions, and institutional contexts, the strength of structural relationships linking HRM practices, work–family dynamics, well-being, and commitment is likely to vary across employee groups.

H1: Structural relationships differ between employees with and without children.

H2: Structural relationships differ between employees with and without dependent responsibilities.

H3: Structural relationships differ between night-shift and non-night-shift employees.

H4: Structural relationships vary across age groups.

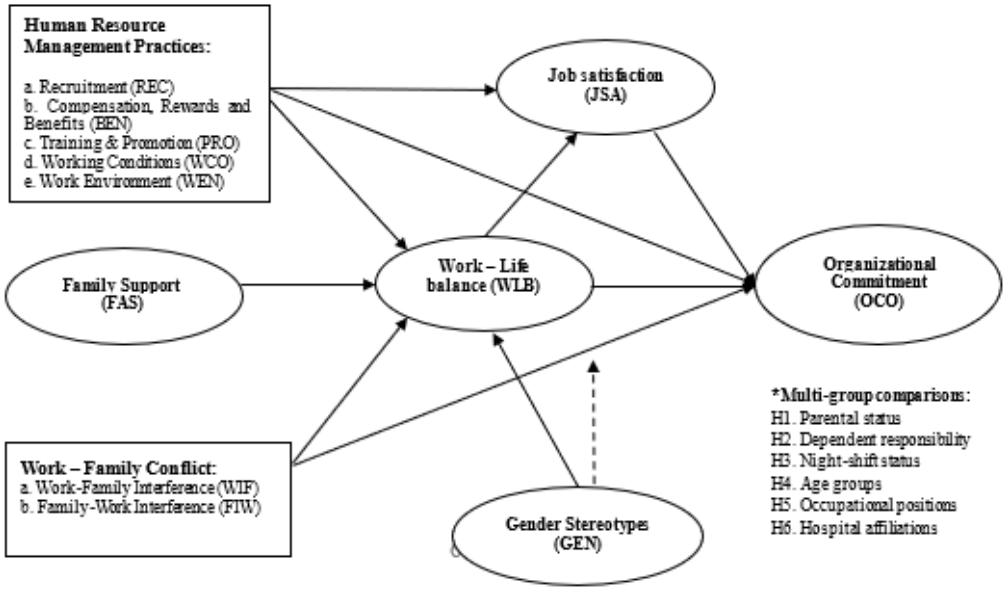
H5: Structural relationships vary across occupational positions.

H6: Structural relationships differ across hospital affiliations.

Drawing on conservation of resources (COR), role theory, and the job demands-resources (JD-R) framework, we expect heterogeneity to be most pronounced in resource-related paths (HRM practices → WLB/JSA/OCO) and demand-related paths (work–family interference → WLB/OCO), whereas the attitudinal core (JSA → OCO) is expected to remain comparatively stable across employee groups.

Figure 1

Proposed research model



*Note: Socio-demographic and occupational variables are used as grouping variables in MGA and are not modeled as control paths.

3 METHODOLOGY

3.1 Sample and data collection

This study draws on survey data collected from 695 female healthcare workers employed in public hospitals in the Mekong Delta region of Vietnam. The following section describes the key demographic and occupational characteristics of the study sample.

The majority of respondents were within the core working-age range (18-45 years, 85.2%). Most participants were married (69.2%). Nurses represented the largest occupational group (53.2%), followed by doctors, technicians, and midwives. Approximately 40% reported working more than 48 hours per week, reflecting a relatively high workload. The sample was drawn from four provincial public hospitals, ensuring institutional diversity.

The sample size exceeded the minimum requirement for PLS-SEM and ensured sufficient statistical power for multi-group comparisons.

3.2 Measures

All constructs were measured using validated multi-item scales adapted from prior organizational research and contextualized to the public healthcare setting. Organizational commitment was modeled as a latent construct reflecting employees' psychological attachment to their organization.

The measurement model was specified to enable the assessment of measurement invariance and subsequent structural comparisons across subgroups (Henseler *et al.*, 2016). All items were measured using Likert-type scales.

Categorical variables (e.g., marital status, parental status, occupational position, hospital affiliation, and shift work) were coded for group classification purposes in the multi-group analysis. Ordinal variables such as age group and weekly working hours were treated as ordered categories in subgroup comparisons.

3.3 Data analysis

Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). Given the study's focus on identifying perceived differences across demographic and occupational subgroups, a multi-group analysis (MGA) approach was employed. The analytical procedure, encompassing measurement invariance testing and multi-group structural comparisons, is illustrated in Figure 2.

3.3.1 Assessment of measurement invariance

Prior to conducting MGA, measurement invariance was assessed using the Measurement Invariance of Composite Models (MICOM) procedure (Henseler *et al*., 2016). Establishing measurement invariance ensures that differences observed across groups are not attributable to measurement discrepancies.

The MICOM procedure consists of three steps. First, configural invariance was established by ensuring identical model specifications, indicators, and estimation procedures across groups. Second, compositional invariance was assessed using permutation tests to verify that composite scores were similarly constructed across groups. Third, the equality of composite means and variances was evaluated.

Following methodological guidelines (Henseler *et al*., 2016), partial measurement invariance - confirmed when configural and compositional invariance are satisfied, was considered sufficient to proceed with multi-group comparisons.

Figure 2

Guidelines for Running MGA in PLS-SEM

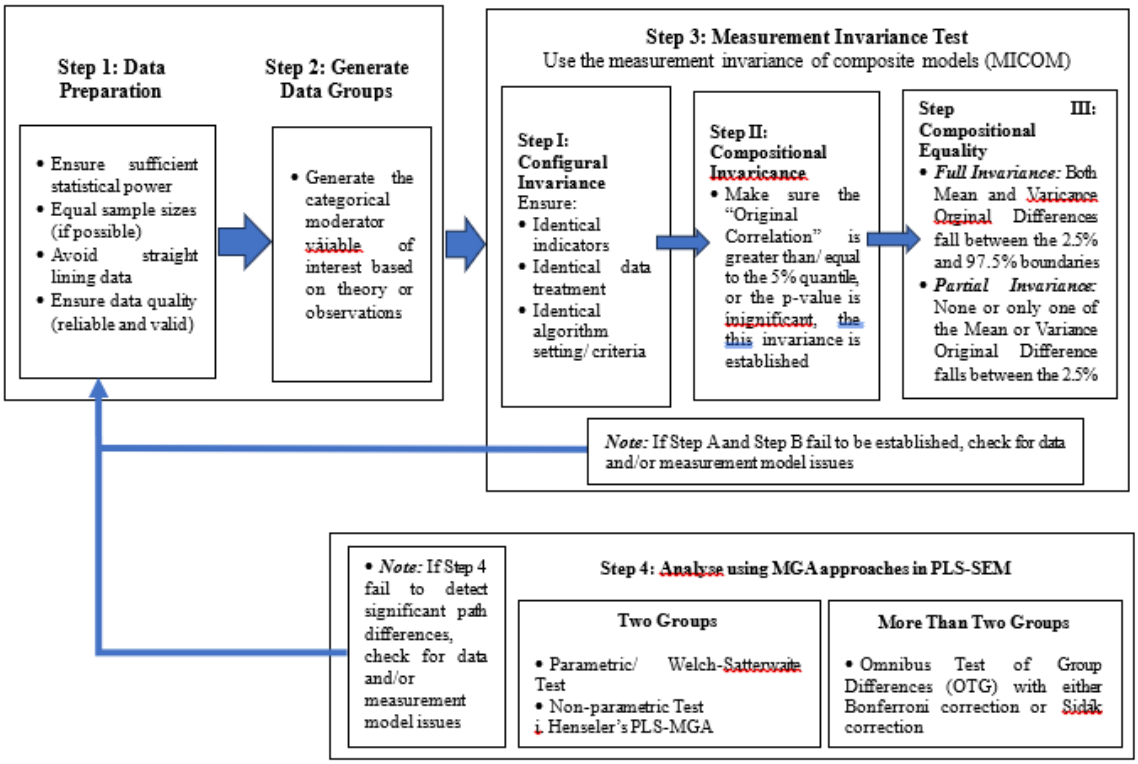
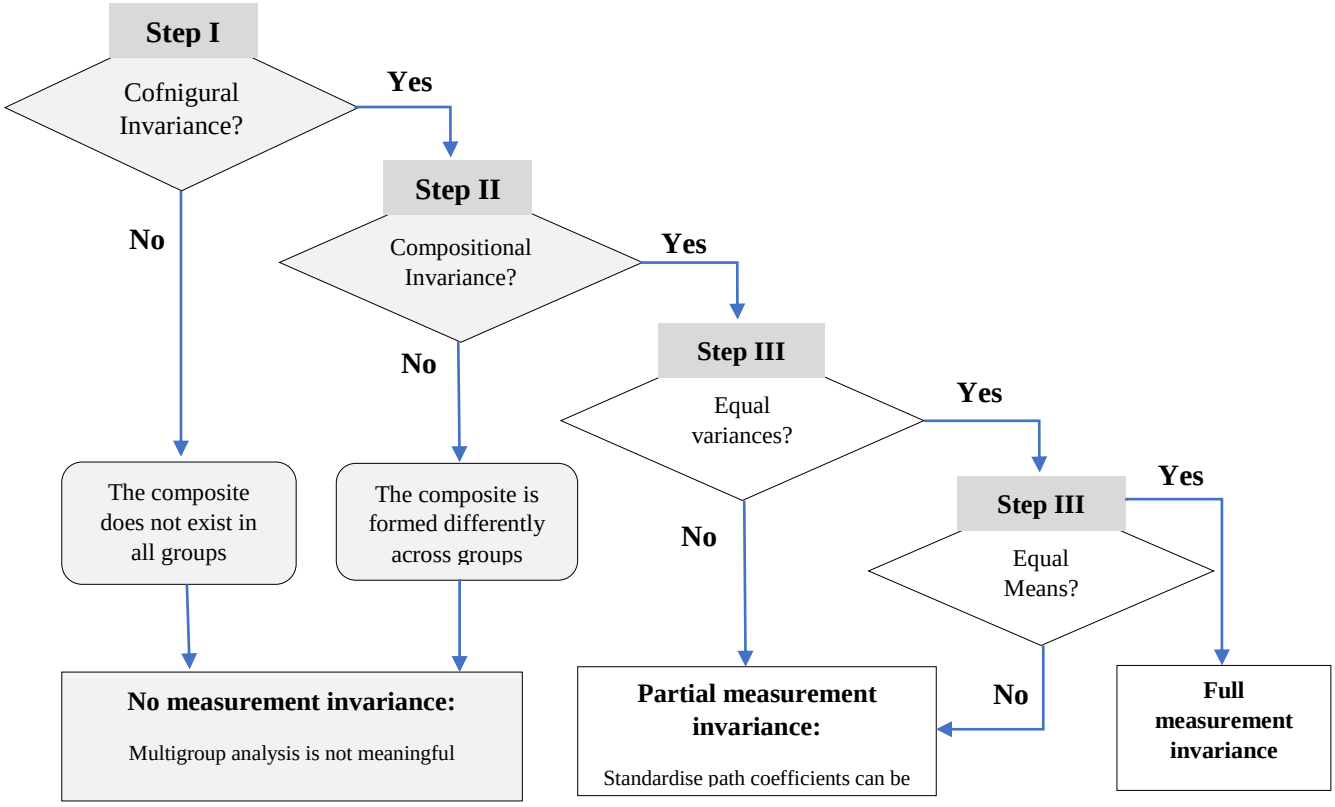


Figure 3

The Measurement Invariance of Composite Models (MICOM) Procedure



3.3.2 Multi-Group Analysis (MGA)

After establishing measurement invariance, the structural model was estimated separately for each predefined subgroup using bootstrapping procedures to obtain path coefficients and standard errors.

Group differences in structural relationships were examined using non-parametric approaches, including Henseler's PLS-MGA and permutation tests (Henseler *et al.*, 2016). A difference between groups was considered statistically significant when the p-value of the group comparison was below 0.05 (or above 0.95 under the one-tailed PLS-MGA criterion).

This analytical procedure enables a rigorous assessment of whether demographic and occupational characteristics explain perceived differences in organizational commitment among female healthcare workers.

4 RESULTS

4.1 Preliminary model assessment

Before proceeding with measurement invariance testing and multi-group comparisons, the measurement and structural models were re-estimated using the full sample to ensure overall model adequacy.

The results indicate that the measurement model performs satisfactorily. All indicator loadings exceed the recommended threshold of 0.70, ranging from 0.793 to 0.956, suggesting adequate item reliability. Internal consistency is supported by Cronbach's alpha and composite reliability values above 0.70 across all constructs. Convergent validity is confirmed, as the AVE values range between 0.700 and 0.867. In addition, discriminant validity is established since all HTMT ratios remain below the conservative threshold of 0.85.

Table 1

Reliability and Validity Assessment of the Measurement Model

Latent variables	BEN	FAS	FIW	GEN	JSA	OCO	PRO	REC	WCO	WEN	WIF	WLB	GEN x FIW	GEN x WIF
BEN														
FAS	0.504													
FIW	0.065	0.037												
GEN	0.052	0.032	0.685											
JSA	0.533	0.450	0.036	0.077										
OCO	0.508	0.391	0.037	0.047	0.664									
PRO	0.603	0.552	0.073	0.053	0.634	0.593								
REC	0.399	0.414	0.091	0.105	0.459	0.367	0.516							
WCO	0.534	0.563	0.058	0.036	0.607	0.500	0.624	0.522						
WEN	0.465	0.474	0.071	0.073	0.565	0.529	0.541	0.466	0.651					
WIF	0.059	0.033	0.661	0.511	0.111	0.096	0.070	0.030	0.099	0.031				
WLB	0.441	0.430	0.076	0.055	0.458	0.421	0.398	0.296	0.500	0.462	0.045			
GEN x FIW	0.160	0.143	0.155	0.226	0.311	0.266	0.186	0.244	0.249	0.187	0.103	0.259		
GEN x WIF	0.186	0.073	0.104	0.183	0.316	0.192	0.128	0.117	0.193	0.145	0.074	0.230	0.675	
Cron-bach's alpha	0.887	0.924	0.962	0.939	0.892	0.946	0.914	0.923	0.926	0.944	0.961	0.951		
CR (rho_c)	0.922	0.946	0.970	0.947	0.921	0.959	0.936	0.945	0.944	0.957	0.969	0.962		
AVE	0.747	0.815	0.867	0.750	0.700	0.823	0.744	0.813	0.772	0.818	0.864	0.835		

Source: author's calculation, 2026

The structural model exhibits moderate explanatory power. The adjusted R^2 values are 0.495 for organizational commitment (OCO), 0.451 for job satisfaction (JSA), and 0.347 for work-life balance (WLB). All Q^2 values exceed zero, indicating adequate predictive relevance.

Table 2

Structural Model Assessment

	Endogenous construct	**R^2**	**Q^2**
	Work–life balance (WLB)	0.347	0.279
	Job satisfaction (JSA)	0.451	0.398
(OCO)	Organizational commitment	0.495	0.423
	Collinearity and effect size		
	Structural path	**VIF**	**f2**
	REC -> WLB	**1.489**	**0.001**
	BEN -> WLB	1.607	0.027
	PRO -> WLB	**1.947**	**0.000**
	WCO -> WLB	2.181	0.032
	WEN -> WLB	1.803	0.024
	REC -> JSA	1.448	0.007
	BEN -> JSA	1.600	0.014
	PRO -> JSA	1.875	0.068
	WCO -> JSA	2.094	0.022
	WEN -> JSA	1.792	0.026
	REC -> OCO	**1.540**	**0.000**
	BEN -> OCO	1.667	0.019
	PRO -> OCO	2.022	0.039
	WCO -> OCO	**2.220**	**0.002**
	WEN -> OCO	1.918	0.035
	WIF -> WLB	1.782	0.011
	FIW -> WLB	2.188	0.030
	WIF -> OCO	2.035	0.029
	FIW -> OCO	2.335	0.018
	FAS -> WLB	1.592	0.017
	WLB -> JSA	1.406	0.018
	WLB -> OCO	1.527	0.012
	JSA -> OCO	2.042	0.089
	GEN -> WLB	1.660	0.021
	GEN x WIF -> OCO	2.052	0.011
	GEN x FIW -> OCO	2.063	0.020

Source: author's calculation, 2026

Collinearity does not pose a concern, as all VIF values are below the conservative threshold of 3.0. Effect size estimates (f^2) are generally small, although the path from job

satisfaction to organizational commitment shows a moderate effect, highlighting its substantive importance in the model.

Overall, the pooled model meets established PLS-SEM quality criteria and provides a valid baseline for subsequent measurement invariance testing and multi-group analysis.

Note: VIF values are below 3.0, indicating no multicollinearity. f^2 values of 0.02, 0.15, and 0.35 represent small, medium, and large effects, respectively. All Q^2 values exceed zero, demonstrating predictive relevance.

4.2 Measurement invariance assessment (MICOM)

Measurement invariance across groups was examined using the MICOM procedure (Hair *et al*., 2019), which involves three steps: (1) configural invariance, (2) compositional invariance assessed via permutation tests, and (3) equality of composite means and variances. Following established guidance, partial measurement invariance was considered sufficient to proceed with MGA when configural and compositional invariance were supported.

4.2.1 Binary group comparisons (parental status, dependent responsibility, and night-shift status)

Configural invariance was established for all binary comparisons because the same indicators, model specifications, data treatment, and algorithm settings were applied across groups.

Table 3

Results of the MICOM Procedure Across Parental Status, Dependent Responsibility, and Night Shift Status

	Parental Status			Dependent Responsibility			Night Shift Status		
Latent Variable	**Step 2: Compositional Invariance (p)**	**Step 3a: Mean Equality (p)**	**Step 3b: Variance Equality (p)**	**Step 2: Compositional Invariance (p)**	**Step 3a: Mean Equality (p)**	**Step 3b: Variance Equality (p)**	**Step 2: Compositional Invariance (p)**	**Step 3a: Mean Equality (p)**	**Step 3b: Variance Equality (p)**
BEN	0.730	0.000	0.243	0.030	0.232	0.017	0.010	0.045	0.103
FAS	0.445	0.025	0.023	0.552	0.351	0.300	0.944	0.001	0.213
FIW	0.632	0.415	0.006	0.246	0.308	0.059	0.344	0.326	0.375
GEN	0.780	0.011	0.005	0.054	0.369	0.224	0.058	0.409	0.083
JSA	0.818	0.201	0.418	0.127	0.365	0.189	0.042	0.173	0.080
OCO	0.996	0.124	0.184	0.760	0.215	0.393	0.264	0.237	0.444
PRO	0.217	0.003	0.211	0.019	0.109	0.102	0.221	0.387	0.452
REC	0.866	0.015	0.205	0.743	0.084	0.065	0.443	0.469	0.449
WCO	0.994	0.006	0.297	0.843	0.037	0.032	0.663	0.021	0.106
WEN	0.151	0.016	0.352	0.347	0.214	0.342	0.143	0.064	0.087
WIF	0.472	0.329	0.019	0.855	0.471	0.146	0.290	0.190	0.319
WLB	0.120	0.142	0.099	0.273	0.341	0.361	0.753	0.068	0.045

Source: author's calculation, 2026

As shown in Table 3, compositional invariance was fully supported for parental status (all $p > .05$). For dependent responsibility and night-shift status, compositional invariance was largely supported, with isolated construct-level deviations (e.g., BEN and PRO; BEN and JSA, respectively). Step 3 indicated several differences in composite means and variances across groups, which is common in applied settings and does not preclude MGA once compositional invariance is largely established. Overall, the MICOM results provide adequate evidence of partial measurement invariance, supporting subsequent multi-group structural comparisons, while group differences involving constructs that did not meet compositional invariance are interpreted cautiously.

4.2.2 Age groups

Age was examined through pairwise MICOM assessments using the 18–29 group as the reference category. Configural invariance was satisfied across all age comparisons. Compositional invariance was generally supported, with limited exceptions (e.g., WIF and PRO in the 18-29 vs. 35 -< 45 comparison; GEN in the 18-29 vs. ≥ 46 comparison). Differences in means and variances were observed across multiple constructs (Table 4). Taken together, the results indicate partial measurement invariance across age cohorts, permitting MGA.

4.2.3 Occupational positions

For occupational groups, nurses were used as the reference category. Configural invariance was established across all comparisons. Compositional invariance was generally supported, although a few constructs did not meet the criterion in specific pairwise tests (Table 5). At the model level, partial measurement invariance was achieved, and MGA was therefore conducted across occupational positions.

Table 4

Results of the MICOM Procedure between age groups

	18-29 vs 30 -< 35			18-29 vs 35 -< 45			18-29 vs ≥ 45		
Latent Variable	**Step 2: Compositional Invariance (p)**	**Step 3a: Mean Equality (p)**	**Step 3b: Variance Equality (p)**	**Step 2: Compositional Invariance (p)**	**Step 3a: Mean Equality (p)**	**Step 3b: Variance Equality (p)**	**Step 2: Compositional Invariance (p)**	**Step 3a: Mean Equality (p)**	**Step 3b: Variance Equality (p)**
BEN	0.377	0.011	0.234	0.736	0.010	0.214	0.753	0.093	0.204
FAS	0.941	0.023	0.150	0.409	0.020	0.095	0.660	0.326	0.038
FIW	0.169	0.427	0.269	0.035	0.074	0.421	0.550	0.303	0.244
GEN	0.095	0.065	0.010	0.207	0.346	0.010	0.034	0.033	0.068
JSA	0.477	0.048	0.251	0.821	0.164	0.065	0.087	0.262	0.024
OCO	0.978	0.020	0.161	0.753	0.153	0.144	0.461	0.145	0.159
PRO	0.241	0.000	0.269	0.018	0.001	0.273	0.633	0.235	0.415
REC	0.632	0.227	0.070	0.914	0.269	0.025	0.568	0.162	0.030
WCO	0.481	0.057	0.414	0.228	0.040	0.384	0.684	0.210	0.158
WEN	0.825	0.017	0.283	0.395	0.032	0.153	0.944	0.020	0.144
WIF	0.811	0.012	0.161	0.445	0.252	0.249	0.666	0.207	0.209
WLB	0.676	0.289	0.041	0.366	0.445	0.490	0.457	0.484	0.129

Source: author's calculation, 2026

Table 5

MICOM Results for Occupational Group Comparisons

Latent Variable	Nurses vs. Physicians			Nurses vs. Midwives			Nurses vs. Technicians		
	Step 2: Compositional Invariance (p)	Step 3a: Mean Equality (p)	Step 3b: Variance Equality (p)	Step 2: Compositional Invariance (p)	Step 3a: Mean Equality (p)	Step 3b: Variance Equality (p)	Step 2: Compositional Invariance (p)	Step 3a: Mean Equality (p)	Step 3b: Variance Equality (p)
BEN	0.920	0.329	0.050	0.435	0.004	0.000	0.367	0.011	0.238
FAS	0.896	0.448	0.040	0.961	0.044	0.131	0.213	0.002	0.429
FIW	0.832	0.091	0.052	0.741	0.041	0.448	0.299	0.015	0.424
GEN	0.030	0.007	0.047	0.034	0.003	0.043	0.083	0.029	0.100
JSA	0.108	0.100	0.247	0.377	0.018	0.112	0.628	0.164	0.026
OCO	0.566	0.091	0.114	0.400	0.077	0.001	0.264	0.017	0.160
PRO	0.652	0.054	0.027	0.575	0.148	0.177	0.077	0.011	0.219
REC	0.987	0.002	0.159	0.280	0.121	0.105	0.003	0.000	0.326
WCO	0.637	0.272	0.083	0.942	0.265	0.234	0.089	0.000	0.044
WEN	0.622	0.202	0.255	0.374	0.273	0.060	0.915	0.021	0.320
WIF	0.752	0.376	0.117	0.771	0.085	0.481	0.533	0.001	0.233
WLB	0.364	0.060	0.258	0.161	0.262	0.003	0.869	0.206	0.122

Source: author's calculation, 2026

4.2.4 Hospital affiliations

MICOM was also performed across the four hospitals, with Dong Thap General Hospital as the reference group. Configural invariance was satisfied, and compositional invariance was largely supported, with limited construct-level exceptions (Table 6, Table 7).

Table 6

Results of the MICOM Procedure betwwen Dong Thap General Hospital, Tra Vinh Obstetrics and Pediatrics Hospital, Tien Giang General Hospital, and An Giang General Hospital

Latent Variable	Dong Thap General Hospital, Tra Vinh Obstetrics & Pediatrics Hospital			Dong Thap General Hospital and Tien Giang General Hospital			Dong Thap General Hospital and An Giang General Hospital		
	Step 2: Compo-sitional Invariance (p)	Step 3a: Mean Equality (p)	Step 3b: Variance Equality (p)	Step 2: Compo-sitional Invariance (p)	Step 3a: Mean Equality (p)	Step 3b: Variance Equality (p)	Step 2: Compo-sitional Invariance (p)	Step 3a: Mean Equality (p)	Step 3b: Variance Equality (p)
BEN	0.093	0.000	0.000	0.248	0.000	0.126	0.456	0.000	0.354
FAS	0.128	0.437	0.416	0.208	0.212	0.470	0.127	0.113	0.288
FIW	0.885	0.005	0.005	0.960	0.007	0.153	0.046	0.000	0.000
GEN	0.368	0.001	0.017	0.516	0.001	0.305	1.000	0.192	0.000
JSA	0.253	0.451	0.247	0.388	0.001	0.290	0.559	0.003	0.480
OCO	0.682	0.002	0.001	0.507	0.021	0.002	0.442	0.000	0.019
PRO	0.692	0.000	0.003	0.853	0.000	0.276	0.400	0.121	0.418
REC	0.825	0.007	0.037	0.776	0.176	0.474	0.787	0.005	0.410
WCO	0.254	0.362	0.072	0.556	0.359	0.039	0.124	0.000	0.010
WEN	0.515	0.037	0.152	0.446	0.458	0.001	0.201	0.006	0.057
WIF	0.314	0.168	0.004	0.599	0.068	0.025	0.751	0.000	0.000
WLB	0.027	0.498	0.029	0.529	0.001	0.000	0.302	0.000	0.001

Source: author's calculation, 2026

Differences in composite means and variances were observed across hospitals, reflecting contextual heterogeneity; however, partial measurement invariance at the model level was considered sufficient to proceed with MGA, in line with established PLS-SEM guidelines.

Table 7

Results of the MICOM Procedure betwwen Tra Vinh Obstetrics Pediatrics Hospital, Tien Giang General Hospital, and An Giang General Hospital

Latent Variable	Tra Vinh Obstetrics and Pediatrics Hospital and Tien Giang General Hospital			Tra Vinh Obstetrics and Pediatrics Hospital and An Giang General Hospital			Tien Giang General Hospital and An Giang General Hospital		
	Step 2: Compo-sitional Invariance (p)	Step 3a: Mean Equality (p)	Step 3b: Variance Equality (p)	Step 2: Compo-sitional Invariance (p)	Step 3a: Mean Equality (p)	Step 3b: Variance Equality (p)	Step 2: Compo-sitional Invariance (p)	Step 3a: Mean Equality (p)	Step 3b: Variance Equality (p)
BEN	0.459	0.486	0.002	0.694	0.000	0.001	0.940	0.000	0.025
FAS	0.900	0.308	0.354	0.469	0.198	0.408	0.544	0.349	0.247
FIW	0.924	0.439	0.085	0.181	0.000	0.000	0.269	0.000	0.000
GEN	0.551	0.325	0.060	0.595	0.000	0.000	0.998	0.000	0.000
JSA	0.789	0.007	0.156	0.752	0.008	0.296	0.174	0.000	0.293
OCO	0.906	0.019	0.000	0.356	0.000	0.000	0.214	0.000	0.428
PRO	0.786	0.334	0.010	0.539	0.000	0.006	0.514	0.000	0.327
REC	0.442	0.001	0.051	0.924	0.470	0.119	0.459	0.000	0.453
WCO	0.295	0.507	0.486	0.157	0.000	0.262	0.251	0.000	0.186
WEN	0.791	0.024	0.000	0.631	0.000	0.010	0.955	0.004	0.146
WIF	0.022	0.009	0.000	0.453	0.039	0.000	0.199	0.000	0.000
WLB	0.291	0.010	0.000	0.087	0.000	0.000	0.440	0.000	0.195

Source: author's calculation, 2026

4.3 Multi-group analysis results

After establishing partial measurement invariance, MGA was performed to test whether structural path coefficients differ across subgroups. Both PLS-MGA and permutation tests yielded consistent results. Group differences were assessed using Henseler's PLS-MGA and permutation tests. A difference was considered statistically significant when $p < 0.05$ (or $p > 0.95$ under the one-tailed PLS-MGA criterion).

4.3.1 Parental status (H1)

Multi-group analysis by parental status indicates limited structural heterogeneity. Among all examined relationships, only the path from gender stereotype to organizational commitment differs significantly between employees with and without children ($\Delta\beta = 0.253$, $p = 0.031$). Specifically, gender stereotype negatively affects organizational commitment among employees without children, whereas the relationship is not significant among those with children.

All other structural paths, including the work–family interface, HRM practices, and the job satisfaction–commitment linkage, do not differ significantly across parental status groups. Therefore, H1 receives partial support.

4.3.2 Dependent responsibility (H2)

Multi-group analysis by dependent responsibility reveals substantial structural heterogeneity. Significant between-group differences are observed for the paths BEN → JSA ($\Delta\beta = -0.202$, $p = 0.034$), PRO → WLB ($\Delta\beta = 0.402$, $p = 0.013$), WCO → WLB ($\Delta\beta = -0.473$, $p = 0.004$), WEN → JSA ($\Delta\beta = 0.292$, $p = 0.022$), and WEN → OCO ($\Delta\beta = -0.421$, $p = 0.017$).

These findings indicate that HRM resources and working conditions operate differently depending on employees' dependent responsibilities. In contrast, the work-family interface and the job satisfaction-commitment linkage remain structurally invariant across groups. Thus, H2 is supported.

4.3.3 Night-shift status (H3)

Multi-group analysis by night-shift status reveals a single significant difference. The effect of work-life balance on job satisfaction is significantly stronger among non-night-shift employees than among night-shift employees ($\Delta\beta$ = -0.231, p = 0.013). All other structural paths do not differ significantly across groups. Therefore, H3 receives partial support, although the overall level of structural heterogeneity is limited.

4.3.4 Age groups (H4)

Multi-group analysis by age reveals several significant structural differences. Compared with older cohorts, younger employees (18-29) exhibit stronger effects of gender stereotype on work–life balance, work environment on job satisfaction, and job satisfaction on organizational commitment. In contrast, promotion opportunities play a stronger role in shaping work-life balance among mid-career employees (35-<45), while working conditions and work environment exert stronger effects on job satisfaction and organizational commitment among late-career employees (≥45). These findings indicate life-stage heterogeneity in the mechanisms linking HRM practices, well-being, and organizational attachment. Therefore, H4 is supported.

4.3.5 Occupational positions (H5)

Multi-group analysis reveals several significant structural differences across occupational positions. The effect of benefits on job satisfaction differs significantly between nurses and technicians ($\Delta\beta$ = -0.007, p = 0.007) as well as between nurses and midwives ($\Delta\beta$ = 0.369, p = 0.016). Working conditions show a stronger influence on work–life balance among technicians than nurses ($\Delta\beta$ = 0.466, p = 0.025). In addition, the negative impact of work-family conflict on organizational commitment differs significantly between nurses and physicians ($\Delta\beta$ = 0.301, p = 0.030).

However, several core relationships, including promotion opportunities, recognition, and work environment remain invariant across occupational groups. H5 and highlight occupation-specific pathways to organizational commitment.

4.3.6 Hospital affiliations (H6)

Multi-group analysis across hospitals revealed significant structural differences in several relationships, particularly for BEN → OCO, WIF → OCO, WIF → WLB, PRO → JSA, REC → WLB, and WCO → OCO/WLB. The negative impact of work-family conflict on organizational commitment was significantly stronger in the specialized women-and-children hospital than in general hospitals, while the effects of benefits and working conditions also varied across institutional contexts. However, most core paths, including GEN → OCO and several HRMP- outcome relationships, remained invariant. Therefore, Hypothesis H6 is partially supported, indicating context-specific heterogeneity rather than a fully different structural model.

Table 8

Multi-group analysis results (PLS-MGA)

Path	Group comparison	Δβ	P_MGA	Hypothesis support
H1: Children status				
GEN → OCO	With vs. without children	0.253	0.031	H1 (partial)
H2: Dependents status				
BEN → JSA	With vs. without dependents	-0.202	0.034	H2 (partial)
PRO → WLB	With vs. without dependents	0.402	0.013	H2 (partial)
WCO → WLB	With vs. without dependents	-0.473	0.004	H2 (partial)
WEN → JSA	With vs. without dependents	0.292	0.022	H2 (partial)
WEN → OCO	With vs. without dependents	-0.421	0.017	H2 (partial)
H3: Night vs. non-night shift				
WLB → JSA	Night vs. non-night shift	-0.231	0.013	H3 (partial)
H4: Age groups				
GEN → WLB	18–29 vs. 30–<35	0.351	0.030	H4 (full)
JSA → OCO	18–29 vs. 30–<35	0.382	0.011	H4 (full)
WEN → JSA	18–29 vs. 30–<35	0.453	0.034	H4 (full)
PRO → WLB	18–29 vs. 35–<45	-0.497	0.032	H4 (full)
WCO → JSA	18–29 vs. ≥45	-0.471	0.012	H4 (full)

Path	Group comparison	Δβ	P_MGA	Hypothesis support
WEN → OCO	18–29 vs. ≥45	-0.543	0.025	H4 (full)
H5: Occupational positions				
BEN → JSA	Nurses vs. Technicians	-0.070	0.007	H5 (partial)
BEN → JSA	Nurses vs. Midwives	0.369	0.016	H5 (partial)
GEN → WLB	Nurses vs. Technicians	-0.355	0.050	H5 (partial)
WCO → WLB	Nurses vs. Technicians	0.466	0.025	H5 (partial)
WIF → OCO	Nurses vs. Doctors	0.301	0.030	H5 (partial)
WIF → WLB	Nurses vs. Technicians	0.341	0.047	H5 (partial)
WLB → OCO	Nurses vs. Technicians	-0.363	0.022	H5 (partial)
H6: Hospital (working unit)				
BEN → OCO	TV Obstetrics & Pediatrics vs. An Giang General	0.334	0.031	H6 (partial)
	TV Obstetrics & Pediatrics vs. Dong Thap General	0.296	0.038	H6 (partial)
	TV Obstetrics & Pediatrics vs. Tien Giang General	0.327	0.026	H6 (partial)
FIW → OCO	TV Obstetrics & Pediatrics vs. Tien Giang General	0.302	0.049	H6 (partial)
	TV Obstetrics & Pediatrics vs. An Giang General	0.399	0.012	H6 (partial)
GEN → WLB	TV Obstetrics & Pediatrics vs. An Giang General	-0.384	0.040	H6 (partial)
	TV Obstetrics & Pediatrics vs. Tien Giang General	-0.433	0.014	H6 (partial)
JSA → OCO	TV Obstetrics & Pediatrics vs. Tien Giang General	-0.341	0.034	H6 (partial)
PRO → JSA	TV Obstetrics & Pediatrics vs. An Giang General	0.464	0.025	H6 (partial)
	An Giang General vs. Dong Thap General	-0.330	0.013	H6 (partial)
REC → WLB	TV Obstetrics & Pediatrics vs. An Giang General	-0.272	0.047	H6 (partial)
	TV Obstetrics & Pediatrics vs. Tien Giang General	−0.273	0.030	H6 (partial)
WCO → OCO	TV Obstetrics & Pediatrics vs. An Giang General	-0.312	0.028	H6 (partial)
WCO → WLB	TV Obstetrics & Pediatrics vs. Dong Thap General	-0.533	0.009	H6 (partial)
WIF → OCO	TV Obstetrics & Pediatrics vs. An Giang General	-0.394	0.019	H6 (partial)
	TV Obstetrics & Pediatrics vs. Dong Thap General	-0.373	0.013	H6 (partial)
	TV Obstetrics & Pediatrics vs. Tien Giang General	-0.540	0.001	H6 (partial)
WIF → WLB	TV Obstetrics & Pediatrics vs. An Giang General	0.671	0.001	H6 (partial)

Path	Group comparison	Δβ	P_MGA	Hypothesis support
	TV Obstetrics & Pediatrics vs. Tien Giang General	0.419	0.016	H6 (partial)
WLB → OCO	TV Obstetrics & Pediatrics vs. Tien Giang General	-0.207	0.040	H6 (partial)
WLB → JSA	An Giang General vs. Dong Thap General	0.311	0.006	H6 (partial)

Source: author's calculation, 2026

Overall, the MGA results indicate that structural heterogeneity is concentrated in HRM resource effects across life stage, dependent responsibility, and institutional context, whereas the core mechanism linking job satisfaction and organizational commitment remains invariant. These findings support a contingency-based HRM approach rather than a universal model in public healthcare settings.

5 DISCUSSION

5.1 What MGA reveals: a common core with conditional pathways

This study examined whether the mechanisms linking HRM practices, work-family dynamics, and well-being to organizational commitment operate similarly across female healthcare workers in public hospitals. The pooled model suggests a broadly consistent structure, yet the MGA results show that several relationships shift once employees are grouped by family responsibilities, work schedules, career stage, occupational role, and hospital context. In other words, some relationships appear "stable" in the average model, but become conditional when the workforce is disaggregated.

A clear pattern is the relative stability of the job satisfaction - commitment link. Across most subgroup comparisons, job satisfaction remains a reliable predictor of organizational commitment, with only modest variation in strength. This finding aligns with a social exchange interpretation: when employees evaluate their jobs positively, they are more likely to reciprocate with stronger attachment. In resource-constrained public hospitals - where financial incentives and promotion prospects may be limited - this affective evaluation may carry even more weight, making job satisfaction a central anchor for commitment.

By contrast, several HRM-related effects are contingent. Benefits, working conditions, promotion opportunities, and the work environment do not exert uniform influence across groups. This pattern is consistent with resource-based explanations (COR and JD-R): when employees face higher resource strain outside work - such as caregiving and dependent responsibilities - organizational resources become more salient and consequential. Under lower external strain, the same practices may be appreciated but less decisive for shaping well-being and attachment.

The MGA results also point to conditional strain pathways. Work–family interference is more commitment-relevant in settings where job demands are concentrated—particularly among nurses and within the specialized women-and-children hospital. This is consistent with role theory and healthcare-specific realities: emotionally demanding work, high patient contact, and irregular schedules intensify role interference, which can erode employees' ability to sustain psychological attachment.

Taken together, these findings suggest that organizational commitment among female healthcare workers follows a layered structure: a stable attitudinal core anchored in job satisfaction coexists with resource-dependent pathways that vary across employee groups and institutional contexts.

5.2 Interpreting subgroup differences: plausible mechanisms behind the patterns

5.2.1 Caregiving and dependent responsibilities

The strongest heterogeneity is observed in comparisons by dependent responsibility, where multiple HRM-related paths differ significantly. A straightforward COR interpretation is that employees with dependents operate under greater time and energy constraints, so organizational resources that reduce depletion (e.g., meaningful benefits, workable conditions, supportive climates) become more influential for their well-being and attitudes. This is not simply "more support is better"; rather, support becomes more decisive when employees are already navigating competing demands and limited personal resources.

5.2.2 Night-shift work

For night-shift status, the key difference is the weaker WLB →JSA relationship among night-shift employees. From a JD-R perspective, night work introduces persistent demands - fatigue, circadian disruption, and reduced recovery - that can blunt the emotional payoff of perceived balance. Even when night-shift employees report some degree of balance, the day-to-day strain may prevent that balance from translating into job satisfaction as strongly as it does for non-night-shift staff. Practically, this points to the value of recovery-focused scheduling and greater shift predictability, rather than treating "WLB" as a purely individual-level outcome.

5.2.3 Age cohorts

Age-based differences are broadly consistent with career stage theory. Younger employees show stronger responses to psychosocial cues and symbolic signals (e.g., work environment and gendered perceptions), whereas mid-career employees appear more responsive to advancement-related resources (promotion opportunities), and late-career employees place greater weight on stability-related features (working conditions and supportive environments shaping satisfaction and commitment). In public hospitals, where pay and extrinsic rewards are often bounded, these shifting priorities become especially visible: early-career staff look for development and relational signals, while later-career staff value workable conditions and predictability.

5.2.4 Occupational roles and hospital contexto

Occupational differences, especially those involving nurses, are consistent with variations in autonomy, emotional labour, and schedule control. Nursing roles tend to concentrate patient-facing intensity and irregular hours, which can intensify work-family interference and make immediate working conditions more consequential. At the hospital level, the stronger work-family interference effects in the specialized women-and-children hospital plausibly reflect higher emotional demands and acuity-related pressures. These contextual differences support a meso-level contingency view: even within the

same public sector, local resource constraints and workload structures shape how HRM and work–family strain translate into commitment.

5.2.5 Parental status and gender stereotypes

The parental-status MGA suggests that the GEN → OCO relationship differs between employees with and without children. A plausible explanation is that gender stereotypes function as a fairness- and identity-relevant signal. For employees without children - often at a more career-salient stage - stereotypes may be interpreted as constraints on advancement and recognition, weakening attachment through reduced perceived support and trust. For employees with children, the direct link becomes non-significant, which may reflect adaptation, competing role priorities, or stronger job embeddedness that dampens the immediate translation of stereotype perceptions into commitment judgments. These interpretations are theory-driven and should be read as mechanisms consistent with the pattern, rather than mechanisms directly tested by MGA.

When interpreted in comparison with the broader international healthcare literature (Geisler *et al*., 2019; Shockley *et al*., 2017), these findings also reveal several context-specific dynamics. While prior studies consistently identify job satisfaction as a central predictor of organizational commitment in healthcare settings, the present results suggest that the role of HRM resources may be more contingent in resource-constrained public hospital systems. In Vietnamese public hospitals, where financial incentives and promotion opportunities are relatively limited, employees may rely more strongly on psychosocial signals, such as work environment quality, fairness, and relational support - when forming commitment judgments. Moreover, the heterogeneity observed across parental status and gender perceptions reflects the persistence of dual-role expectations experienced by many female employees in Asian societies. Compared with healthcare systems in many Western countries, where institutional childcare and work-family policies are more developed, female healthcare workers in Vietnam may experience stronger work-family tensions, making the interaction between organizational resources and family roles particularly salient.

5.3 The role of gender stereotypes in shaping strain: interpreting the interaction effects

The structural model also identifies interaction effects involving gender stereotypes (GEN x WIF and GEN x FIW). These interaction effects suggest that gender stereotypes may intensify how employees interpret role interference. When gendered expectations are salient, interference between work and family roles can be experienced not only as a time or strain problem, but as a deeper sense of "misfit" between professional demands and socially prescribed family roles. This meaning-based appraisal can make interference more damaging for attachment, particularly in healthcare roles where performance pressure, moral responsibility, and public accountability are high. Practically, this implies that stereotype climates are not merely an equity concern; they can also shape retention by strengthening the pathway from interference to disengagement.

5.4 Contributions and implications

5.4.1 Theoretical implications

These findings contribute to the debate on the universality of HRM–commitment relationships. Much of the existing literature implicitly assumes parameter invariance across employee groups. The present results challenge this assumption by demonstrating meaningful structural heterogeneity. While the satisfaction-commitment relationship remains stable, several resource-related pathways vary across life stages, occupational roles, and family responsibilities.

From a theoretical perspective, the findings suggest that organizational commitment may follow a layered structure in which a stable attitudinal core coexists with contingent pathways shaped by resource constraints and role demands. Methodologically, the use of multi-group PLS-SEM illustrates how heterogeneity can be identified without fragmenting the underlying commitment model.

5.4.2 Practical implications

For hospital administrators, the results suggest that HR policies designed for an "average employee" may be insufficient. Employees with dependent responsibilities benefit from family-supportive practices and manageable schedules, while early-career staff respond more strongly to mentoring and a supportive work climate. Mid- and late-career employees place greater emphasis on stable working conditions and transparent promotion pathways.

Reducing excessive overtime, improving shift predictability, and providing childcare support may be particularly important for nursing staff and specialized hospitals with high patient demands. At the same time, the consistent role of job satisfaction highlights a universal lever: fostering fair leadership, meaningful work design, and a respectful organizational climate can strengthen commitment across employee segments, even in resource-constrained public healthcare systems.

6 CONCLUSION AND LIMITATIONS

6.1 Conclusion

This study demonstrates that organizational commitment among female healthcare workers in public hospitals is shaped by a heterogeneous set of mechanisms. While job satisfaction remains a universal driver, the effects of HRM practices, work–family dynamics, and gender perceptions vary across life stages, caregiving roles, occupations, and institutional contexts.

By applying PLS-SEM and multi-group analysis, the study moves beyond average effects and reveals context-specific pathways to commitment. These findings support a contingent and perception-based view of commitment and provide a foundation for segmented HRM strategies in public healthcare systems.

6.2 Limitations and future research

6.2.1 Limitations

This study has several limitations. First, the cross-sectional design limits causal inference between the examined variables. Second, the data were collected from public hospitals in a single region of Vietnam, which may restrict the generalizability of the findings to other healthcare systems or institutional contexts. Third, the study relies on self-reported measures, which may introduce common method bias despite the procedural and statistical remedies applied.

6.2.2 Future research

Future studies could extend this research in several directions. Longitudinal designs would help clarify how organizational commitment evolves across career stages and changing family responsibilities. Comparative studies across regions, countries, or healthcare systems could further test the contextual robustness of the contingent commitment model identified in this study. In addition, future research may incorporate additional moderators such as leadership style, organizational climate, or workload intensity to better understand how contextual and organizational conditions shape commitment formation.

ACKNOWLEDGEMENT

The authors gratefully acknowledge the support of time and facilities from Tra Vinh University (TVU) for this study.

FUNDING

This work was supported by Tra Vinh University under Decision No. 9202/QĐ-ĐHTV, dated October 20, 2023.

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Authors' Contribution

All authors contributed equally to the development of this article.

Data availability

All datasets relevant to this study's findings are fully available within the article.

How to cite this article (APA)

Ho, D. M., Nguyen, N. V., & Minh, H. P. (2026). BEYOND AVERAGE EFFECTS: STRUCTURAL HETEROGENEITY IN ORGANIZATIONAL COMMITMENT AMONG FEMALE HEALTHCARE WORKERS IN PUBLIC HOSPITALS. *Veredas Do Direito*, *23*(6), e235711. https://doi.org/10.18623/rvd.v23.5711