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The Role of Job Stress and Professionalism as Mediators of the Effects of Shift Work and Work Environment on the Well-Being of Pharmacy Personnel in Hospitals in Kendari City

Yusniati Dwi Pemudi¹, Nasrul², Adryan Fristiohady³, Jafriati⁴

¹Doctoral Program in Management Science, Halu Oleo University, Kendari, Indonesia

²Faculty of Economics and Business, Halu Oleo University, Kendari, Indonesia

³Faculty of Pharmacy, Halu Oleo University, Kendari, Indonesia

⁴Faculty of Public Health, Halu Oleo University, Kendari, Indonesia

Corresponding Author : depe278@gmail.com

ABSTRACT: The well-being of pharmacy personnel is an important factor in maintaining service quality and patient safety in hospitals. This study aimed to analyze the effects of shift work and the work environment on the well-being of pharmacy personnel, with job stress and professionalism as mediating variables. This study employed a quantitative approach with an explanatory research design. The research involved pharmacy personnel working at RSU Bahteramas and RSUD Kota Kendari. A total of 110 pharmacy personnel were selected using saturated sampling. Data were collected through questionnaires and analyzed using Partial Least Squares Structural Equation Modeling with SmartPLS. The results showed that the work environment had a positive and significant effect on professionalism, with a coefficient of 0.557, and on well-being, with a coefficient of 0.354. Professionalism also had a positive and significant effect on well-being, with a coefficient of 0.543. In contrast, shift work had no significant effect on job stress, professionalism, or well-being. The work environment had no significant effect on job stress, while job stress had no significant effect on well-being. The mediation analysis showed that job stress did not mediate the effects of shift work or the work environment on well-being. Professionalism did not mediate the effect of shift work on well-being. However, professionalism partially mediated the effect of the work environment on well-being, with an indirect effect coefficient of 0.302. The research model explained 67.9 percent of the variance in the well-being of pharmacy personnel. This study concludes that improving the well-being of pharmacy personnel requires hospital management to prioritize the improvement of the work environment and the strengthening of professionalism.

1. INTRODUCTION

The well-being of health professionals has become a major concern in the global literature as modern health-care systems become increasingly complex. Service quality depends not only on technology and facilities but also on the psychological condition of the professionals who provide care [1]. Burnout, job stress, and emotional exhaustion therefore remain important organizational issues. International studies indicate that health professionals experience substantial occupational stress because their work requires high accuracy, major responsibility for human safety, and intensive time pressure [2]. Compared with physicians and nurses, the well-being of pharmacy personnel has received relatively less attention, although pharmacists play a crucial role in medication safety, patient counseling, and clinical decision support. Pharmacy personnel work in demanding and

dynamic environments. They are expected to maintain technical competence while coping with limited resources, high service demands, and the possibility that medication-related errors may have serious consequences [3]. These conditions may increase psychological pressure and affect employee well-being. Shift work is one potential source of occupational demand in hospital pharmacy services because care must be provided continuously. Shift schedules may disrupt circadian rhythms, sleep, and recovery, and can contribute to fatigue and occupational stress [4,5].

However, the effects of shift work on well-being are not always consistent and may depend on organizational support and individual conditions [6]. This inconsistency suggests that the relationship may involve psychological mechanisms such as job stress. The work environment is another important factor. It includes physical conditions, interpersonal relationships, organizational support, and workplace policies. An unfavorable environment can increase stress and burnout [7], whereas a supportive environment may improve satisfaction, social support, and well-being [8]. Previous evidence also suggests that the influence of the work environment may operate through mediating mechanisms. Accordingly, examining job stress and professionalism can provide a more comprehensive explanation of how workplace conditions are related to the well-being of pharmacy personnel. Job stress represents an individual's response when work demands exceed adaptive capacity [9]. Although job stress is generally associated with poorer well-being, its effects can vary according to coping resources and organizational support [10,11].

Job stress has frequently been positioned as a mediator between work demands and employee outcomes [12]. Nevertheless, many studies use only one mediator, leaving room for models that simultaneously examine negative and positive psychological pathways. Professionalism is a potential positive pathway. It reflects competence, professional values, ethics, dedication, and commitment to the profession [13]. Among health professionals, stronger professionalism has been associated with more positive work attitudes and well-being [14]. The Job Demands-Resources (JD-R) Theory provides the main theoretical framework for this study [15]. Shift work is conceptualized as a job demand, while a supportive work environment functions as a job resource. Job stress represents the health-impairment pathway, whereas professionalism is treated as a personal or motivational resource.

Several research gaps underpin this study. Prior studies have commonly focused on a single mediator, pharmacy personnel have been less frequently studied than other health professions, and the simultaneous integration of job stress and professionalism within a JD-R-based model remains limited. The Indonesian hospital context also differs from settings in which much of the previous evidence was generated. Resource limitations, workload, staffing, and organizational practices may shape the experiences of pharmacy personnel differently, making local empirical evidence important. Practically, identifying the determinants of well-being can help hospital management design more appropriate interventions involving shift arrangements, workplace improvement, and professional development. Theoretically, this study extends the JD-R perspective by simultaneously examining job stress and professionalism as mediating variables in the relationship between work conditions and employee well-being.

The proposed model therefore integrates shift work and the work environment as exogenous variables, job stress and professionalism as mediators, and pharmacy personnel well-being as the endogenous variable. The study specifically examines whether the work environment and shift work affect well-being directly and indirectly through job stress and professionalism. Accordingly, the study aims to test a dual-mediation model among pharmacy personnel working in hospital pharmacy installations in Kendari City.

2. MATERIALS AND METHODS

2.1 Research Approach and Design

This study used a descriptive quantitative approach based on the positivist paradigm. Quantitative data were analyzed statistically to test the proposed relationships among shift work, the work environment, job stress, professionalism, and pharmacy personnel well-being [16]. Based on its objectives, the study employed an explanatory design to explain functional and causal relationships among variables and to test the proposed hypotheses [17]. The study examined causal relationships among shift work, work environment, job stress, professionalism, and well-being using data collected after the relevant work experiences had occurred.

2.2 Location and Study Period

The study was conducted at the pharmacy installations of Kendari City Regional General Hospital (RSUD Kota Kendari) and Bahteramas General Hospital in Southeast Sulawesi, Indonesia, from September 2025 to April 2026.

2.3 Population and Sample

The population consisted of all pharmacy personnel working in the pharmacy installations of the two hospitals, including pharmacists and pharmaceutical technical staff. A saturated or census sampling technique was used, meaning that all eligible members of the population were included as respondents. The final sample comprised 110 pharmacy personnel. The use of saturated sampling was also considered appropriate for the PLS-SEM approach because the method can be applied to relatively modest sample sizes while simultaneously estimating measurement and structural models.

2.4 Data Sources and Instrument

Primary data were obtained directly from respondents through the research questionnaire and structured data collection. Secondary data were obtained from relevant literature and institutional information from the study sites. The main research instrument was a questionnaire. Prior to the main analysis, the instrument was evaluated for validity and reliability. All questionnaire items used in the study met the validity criteria, with item-total correlations exceeding the reference value and significance levels below 0.05. The preliminary reliability test showed Cronbach's alpha values above 0.70 for all constructs: shift work (0.912), work environment (0.897), job stress (0.945), professionalism (0.947), and well-being (0.963). Thus, the instrument was considered reliable.

2.5 Statistical Analysis

Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS. This variance-based SEM approach enables simultaneous assessment of the measurement model and the structural model. The measurement model was used to evaluate indicator validity and construct reliability, while the structural model was used to test causal relationships. Hypothesis testing was based on bootstrapping, with $p < 0.05$ indicating statistical significance.

Operational Definitions

Shift Work

Shift work was defined as a work-time arrangement that divides operating hours into morning, evening, and night periods to maintain continuous hospital pharmacy services. Within the JD-R framework, shift work was treated as a job demand because it requires substantial physical and psychological adjustment [15]. Operationally, shift work was measured through three reflective indicators: shift intensity and frequency, circadian rhythm disruption, and workload during shifts [4]. Shift intensity and frequency describe how often pharmacy personnel are exposed to rotating work schedules. Circadian rhythm disruption reflects the physiological effects of changing work schedules on sleep quality and physical condition. Shift workload reflects the perceived level of work demands experienced during a particular shift. Together, these indicators represent the latent construct of shift work.

Work Environment

The work environment was defined as the overall physical and non-physical conditions surrounding work activities that may influence performance and well-being. In the JD-R framework, a supportive environment functions as a job resource. Operationally, the work environment was assessed through physical and non-physical workplace dimensions [7]. The physical work environment included workspace conditions, facilities, and the availability of equipment needed to perform pharmacy services. The non-physical work environment included interpersonal relationships, organizational support, communication, and the overall workplace atmosphere. These indicators jointly reflected the quality of the work environment.

Job stress was conceptualized as psychological pressure arising when perceived job demands exceed the individual's adaptive capacity. Professionalism reflected competence, professional ethics, and autonomy, while well-being reflected positive emotion, engagement, relationships, meaning, and accomplishment.

3. RESULTS AND DISCUSSION

3.1 Respondent Characteristics

Table 1. Respondent Characteristics by Sex

No.	Category	Frequency (persons)	Percentage (%)
1	Male	17	16.43
2	Female	93	83.57
Total	Total	110	100

Table 2. Respondent Characteristics by Age

No.	Category	Frequency (persons)	Percentage (%)
1	>30 years	27	24.54
2	31-40 years	44	40
3	41-50 years	28	25.45
4	>51 years	11	10
Total	Total	110	100

Table 3. Respondent Characteristics by Length of Service

No.	Length of Service	Frequency (persons)	Percentage (%)
1	<5 years	17	15.45
2	5-10 years	26	23.63
3	11-15 years	44	40.00
4	16-20 years	12	10.90
5	>20 years	11	10.02
Total	Total	110	100

3.2 Descriptive Analysis

The mean score for shift work was 2.74, indicating a neutral category. Respondents therefore reported varied experiences regarding schedule changes, rest-pattern disruption, and workload during particular shifts. Although the overall score was neutral, shift-related risks still warrant attention because some respondents reported potentially stressful shift conditions. The work environment had a mean score of 3.85 and was categorized as good. Pharmacy personnel generally perceived the workplace as supportive of their duties. A supportive environment is particularly important in pharmacy services, where accuracy, medication preparation, information provision, and patient interaction require appropriate facilities and organizational support. Job stress had a mean score of 2.54 and was categorized as low. Respondents generally did not report high levels of work pressure, fatigue, role conflict, or emotional strain. Nevertheless, job stress remained an important mediator to be tested in the structural model.

Professionalism had a mean score of 3.90 and was categorized as high. This indicates that respondents generally demonstrated good professional competence, ethical conduct, and autonomy in performing hospital pharmacy services. Well-being had a mean score of 3.89 and was categorized as high. Respondents generally reported positive psychological and work experiences involving satisfaction, engagement, meaningful work, social relationships, and accomplishment.

3.3 Measurement and Structural Model

Inferential analysis was conducted using PLS-SEM with SmartPLS. The outer model assessed indicator validity and reliability, while the inner model examined the direction, magnitude, and significance of relationships among constructs. The model included shift work and work environment as exogenous variables, job stress and professionalism as mediators, and well-being as the endogenous variable. Hypotheses were tested using bootstrapping and were considered significant at $p < 0.05$. Goodness of fit for the structural model was evaluated using R-square and predictive relevance (Q-square). R-square indicates the proportion of variance in an endogenous construct explained by its predictors.

Shift work and the work environment explained 31.7% of the variance in professionalism but only 3.1% of the variance in job stress. Together with job stress and professionalism, these variables explained 67.9% of the variance in well-being, indicating moderate explanatory power for the main outcome. The Q-square value was 0.788, which was greater than zero and therefore indicated predictive relevance of the structural model. The estimated model produced an SRMR value of 0.079, below the 0.08 criterion. The estimated NFI value was 0.747. These results indicate acceptable fit based particularly on the SRMR criterion.

Table 4. R-square Values of Endogenous Variables

Endogenous Variable	R-square	R-square Adjusted
Professionalism	0.317	0.305
Job Stress	0.031	0.013
Well-Being	0.679	0.667

Table 5. Model Fit Results

Indicator	Saturated Model	Estimated Model
SRMR	0.070	0.079
d_ULS	0.750	0.952
d_G	0.548	0.567
Chi-square	356.773	353.004
NFI	0.744	0.747

Table 6. Reliability and Convergent Validity

Variable	Cronbach's Alpha	rho_a	rho_c	AVE	Interpretation
Shift Work	0.783	1.214	0.849	0.654	Reliable and valid
Work Environment	0.750	0.752	0.889	0.800	Reliable and valid
Job Stress	0.875	0.907	0.914	0.726	Reliable and valid
Professionalism	0.880	0.895	0.926	0.806	Reliable and valid
Well-Being	0.937	0.941	0.952	0.800	Reliable and valid

3.4 Hypothesis Testing

Table 7. Direct Effect Hypothesis Testing

Variable Bebas	Variable Terikat	Path Coefficient	T-statistic	P-value	Interpretation
Shift Work	Job Stress	0.167	1.562	0.121	Not significant
Shift Work	Professionalism	0.075	0.963	0.338	Not significant
Shift Work	Well-Being	0.095	0.988	0.325	Not significant
Work Environment	Job Stress	-0.063	0.685	0.494	Not significant
Work Environment	Professionalism	0.557	9.350	0.000	Significant
Work Environment	Well-Being	0.354	4.946	0.000	Significant
Job Stress	Well-Being	-0.100	1.444	0.152	Not significant
Professionalism	Well-Being	0.543	7.694	0.000	Significant

Table 8. Indirect Effect Hypothesis Testing

Variable Bebas	Variable Terikat	Variable Mediasi	Path Coefficient	T-statistic	P-value	Interpretation
Shift Work	Well-Being	Job Stress	-0.017	1.035	0.303	Not significant
Shift Work	Well-Being	Professionalism	0.040	0.972	0.333	Not significant
Work Environment	Well-Being	Job Stress	0.006	0.507	0.613	Not significant
Work Environment	Well-Being	Professionalism	0.302	6.271	0.00	Significant

Table 9. Mediation Testing Results

Variable Bebas	Variable Terikat	Variable Mediasi	Direct Effect	Indirect Effect	Interpretation
Shift Work	Well-Being	Job Stress	0.095	-0.017	No mediation
Shift Work	Well-Being	Professionalism	0.095	0.040	No mediation
Work Environment	Well-Being	Job Stress	0.354	0.006	No mediation
Work Environment	Well-Being	Professionalism	0.354	0.302	Partial mediation

The low R-square for job stress (0.031) indicates that shift work and the work environment explained only 3.1% of its variance. Therefore, the non-significant effects should not be interpreted as evidence that workplace conditions are irrelevant. More proximal demands, such as prescription volume, peak queues, staffing, overtime, interruptions, role conflict, accuracy pressure, and safety events, may better explain job stress in pharmacy services. The significant effect of the work environment on professionalism is consistent with the view that professional behavior is strengthened when organizations provide conditions

that support professional standards, service orientation, and autonomy [13]. Supportive managerial practices and interpersonal relationships can also contribute to positive work experiences [8,18]. From a JD-R perspective, job resources have a motivational function. A supportive work environment provides safe physical conditions, adequate facilities, social support, clear communication, and work structures that enable pharmacy personnel to perform according to professional standards. The direct coefficient of 0.354 indicates that the work environment remained meaningfully associated with well-being after the mediators were included. All dimensions of job stress were in the low category, whereas all dimensions of well-being were in the high category. The relatively restricted variation in job stress may have reduced its ability to statistically distinguish differences in well-being among respondents.

Professionalism had a positive and significant effect on well-being ($\beta = 0.543$, $p < 0.001$). This was the strongest direct predictor of well-being in the model, indicating that professional competence, ethical practice, and autonomy are important resources for maintaining positive work experiences. Shift work did not significantly affect job stress, professionalism, or well-being. These findings suggest that the shift schedule itself was not the dominant determinant of psychological or professional outcomes in this sample. The work environment did not significantly affect job stress ($\beta = -0.063$, $p = 0.494$), but it significantly improved professionalism ($\beta = 0.557$, $p < 0.001$) and well-being ($\beta = 0.354$, $p < 0.001$). Job stress had a negative but non-significant effect on well-being ($\beta = -0.100$, $p = 0.152$). The direction was theoretically consistent with the health-impairment pathway, but the empirical evidence was insufficient to confirm the relationship.

The indirect effect of shift work on well-being through job stress was not significant ($\beta = -0.017$, $p = 0.303$), and the indirect effect through professionalism was also not significant ($\beta = 0.040$, $p = 0.333$). The indirect effect of the work environment on well-being through job stress was not significant ($\beta = 0.006$, $p = 0.613$). Thus, job stress did not mediate the relationship between the work environment and well-being. In contrast, the indirect effect of the work environment on well-being through professionalism was positive and significant ($\beta = 0.302$, $p < 0.001$). Because the direct effect of the work environment on well-being also remained significant, professionalism functioned as a partial mediator. The findings provide stronger support for the motivational process of JD-R Theory than for the health-impairment process. A supportive work environment acted as a job resource that strengthened professionalism and well-being.

The absence of significant shift-work effects may reflect the characteristics of the schedules, adaptation among experienced personnel, organizational arrangements, or other demands that were not directly measured in the present model. Similarly, the low level and limited variability of job stress may explain why job stress did not emerge as a significant mediator. Non-significance does not mean that stress-related risks are absent; rather, the present data did not provide sufficient evidence for the proposed pathway. At the descriptive level, professional autonomy was one of the strongest aspects of professionalism, while meaning, positive emotion, and engagement were prominent dimensions of well-being. This pattern supports the idea that professional identity and the ability to exercise professional judgment may make work more meaningful. The health-impairment pathway remains theoretically plausible: shift work may disturb recovery and biological rhythms, and accumulated strain may subsequently reduce well-being [4,20]. However, this pathway was not empirically confirmed in the present sample.

Professionalism was conceptualized as a personal resource. Such a resource may arise from education, experience, professional values, and organizational support rather than directly from work schedules. This helps explain the very small and non-significant effect of shift work on professionalism [13]. A supportive environment can theoretically reduce the effects of job demands and prevent health impairment [12,21]. In this study, however, job stress was not the dominant mechanism linking the work environment to well-being. The significant work environment $\rightarrow$ professionalism $\rightarrow$ well-being pathway represents the motivational process of JD-R Theory. Workplace resources strengthen the capacity of pharmacy personnel to apply competence, ethics, and professional judgment, which in turn supports engagement, meaning, and accomplishment. Partial mediation has practical importance. The work environment improved well-being both directly and indirectly through professionalism. Hospital management should therefore integrate workplace improvement with professional development rather than treating them as separate programs.

The main theoretical contribution is evidence that professionalism can operate as a personal resource linking job resources to well-being. Future research could examine whether professional autonomy, competence, or ethics provides the strongest mediating mechanism. Overall, the findings support JD-R Theory primarily through its motivational process: the work environment, as a job resource, influenced professionalism and well-being, while professionalism strongly influenced well-being. The health-impairment pathway received limited empirical support because shift work did not significantly predict job stress

and job stress did not significantly predict well-being. The principal contribution of the study is the demonstration that professionalism partially mediates the relationship between the work environment and well-being among pharmacy personnel.

Among all tested pathways, work environment → professionalism → well-being was the most consistent, supported by significant coefficients and a coherent descriptive pattern. These findings provide a basis for hospital management to integrate improvements in the work environment with strategies that strengthen professional competence, ethics, and autonomy.

4. CONCLUSION

Shift work had a positive but non-significant effect on the well-being of pharmacy personnel. Thus, the data did not show that shift work meaningfully increased or decreased well-being. Shift work had a positive but non-significant effect on job stress. The implemented shift system was therefore not shown to significantly increase job stress in this sample. Shift work had a positive but non-significant effect on professionalism. The data did not show a meaningful change in professionalism attributable to shift work. The work environment had a negative but non-significant effect on job stress. Thus, the present data did not demonstrate a significant reduction in job stress associated with the work environment.

The work environment had a positive and significant effect on professionalism. Better working conditions, organizational support, work relationships, and facilities were associated with stronger professionalism. The work environment had a positive and significant effect on well-being, indicating that a better workplace can meaningfully improve the well-being of pharmacy personnel. Job stress had a negative but non-significant effect on well-being. Therefore, the present study did not establish a statistically significant reduction in well-being attributable to job stress. Professionalism had a positive and significant effect on well-being. Stronger professionalism was associated with better well-being among pharmacy personnel.

Job stress did not mediate the effect of shift work on well-being. Job stress did not mediate the effect of the work environment on well-being; the work environment had a stronger direct relationship with well-being than an indirect relationship through job stress. Professionalism did not mediate the effect of shift work on well-being. Professionalism partially mediated the effect of the work environment on well-being. The work environment improved well-being both directly and indirectly through stronger professionalism. This was the only statistically significant mediation pathway in the model.

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AUTHOR CONTRIBUTIONS

Yusniati Dwi Pemudi: conceptualization, investigation, data curation, formal analysis, and writing of the manuscript.

CONFLICT OF INTEREST

The author declares no conflict of interest.

DATA AVAILABILITY STATEMENT

Data supporting the findings of this study are available from the author upon reasonable request, subject to institutional and ethical requirements.

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