Impact of shift work on the quality of life of nursing staff in Congo-Brazzaville: A cross-sectional Study

ABSTRACT

Introduction: The negative impact of shift work on quality of life is well-established. This study aimed to analyze the consequences of shift work on the quality of life of nursing staff in public hospitals in Congo-Brazzaville. **Materials and Methods**: We conducted a multicentric cross-sectional study from March to August 2021, involving nursing staff from nine public hospitals in four departments of the country. The "Nursing Work Index - Extended Organization" (NWI-EO), the Copenhagen Psychosocial Questionnaire (COPSOQ), and the "Short Form Survey" (SF-12) were used to measure quality of work life, work-private life balance, and off-work quality of life, respectively. **Results**: The study population consisted of 454 nurses (64.9%) and 246 nursing assistants (35.1%), with a majority being females (83.6%) and an average age of 39.2 years±8.1. Most worked on a two 12-hour shift schedule (2x12), 73.9% had a continuous working rhythm, and in 81.6% of cases, the rotation was short. The main factors detrimental to the quality of work life were understaffing, poor colleague relationships, absence of leaves, and inadequate communication ($p<0.05$). Alternating shift work affected private life, especially in the case of an 8-hour shift pattern (3x8). However, the overall prevalence of poor quality of life was 4.1%, with no correlation with the working rhythm ($p>0.05$). **Conclusion**: The negative effects of shift work on the quality of life of nursing staff necessitate the introduction of preventive measures to improve patient care quality.

Keywords: Shift work, nursing staff, quality of life, Congo-Brazzaville.

INTRODUCTION

The concept of "quality of life," as defined by the WHOQOL (World Health Organization Quality Of Life) Group, is undeniably multidimensional, encompassing not only an individual's physical and mental health but also their social relationships and emotional well-being[1]. In the medical realm, it's undeniable that the quality of life of healthcare professionals, especially nurses, is closely intertwined with their performance, efficiency, and ultimately, the quality of care they provide [2]. It is, however, crucial to note that shift work, though essential to ensure continuous care delivery,

can potentially disrupt this quality of life [3]. Beyond evident physiological alterations such as sleep disturbances or metabolic imbalances, these schedules have the potential to disrupt mental health, social and family life[4], thereby jeopardizing the overall well-being of the caregiving staff [5]. The ramifications of such working conditions can range from burnout to depression [6], consequently eroding job satisfaction. These outcomes, far from being insignificant, pose a burden for healthcare institutions, manifesting as increased absenteeism, higher staff turnover, and potential degradation of the care rendered. In Sub-Saharan Africa, studies on this topic remain limited, particularly concerning shift work among nurses and its impact on their quality of life both at work and outside of it. This is the context in which Congo-Brazzaville is situated, where a preliminary study already highlighted the negative effects of shift work on the quality of life of ninety-one nurses from the Loandjili general hospital in Pointe-Noire [7]. However, the limited sample size of the study didn't allow for a comprehensive extrapolation of these findings to the entire profession. Given this backdrop, it became imperative to deepen our understanding of how shift work affects the quality of life of nursing staff, paying particular attention to each of its impacted facets. Therefore, this study was designed with the aim to analyze the consequences of shift work on the quality of life of nursing personnel in the public hospitals of Congo-Brazzaville.

MATERIALS AND METHODS

1. Study Type, Setting, and Population

This was a multicentric and cross-sectional study with prospective data collection conducted over six months, from March to August 2021, in nine public hospitals distributed across four administrative departments in Congo. The selected hospitals were:

- In Brazzaville: University Hospital Center (UHC), Central Military Hospital Pierre-Mobengo (CMH-PM), Makelekele Reference Hospital (MRH), and Talangaï Reference Hospital (TRH).
- In Pointe-Noire: Adolphe Sicé General Hospital (ASGH), Tié-Tié Base Hospital (TBH), and Regional Military Hospital (RMH),
- In Dolisie: Dolisie General Hospital (DGH),
- In Oyo: Edith Lucie Bongo-Ondimba General Hospital (ELBOGH).

The study population, recruited through non-exhaustive sampling, consisted of nursing staff working in the various departments of the selected hospitals, who were present at the time of the

survey and agreed to complete the questionnaire. This caregiving staff should have at least 20 working hours per week and 12 effective months of service.

2. Study methods

2.1. Procedure

In each department, the survey was managed by the supervising nurse of that department. Questionnaires were distributed to all caregivers. The completed questionnaires were collected at the end of each week.

2.2. Data Collection and OutcomeMeasures

The data for the study were collected using a survey sheet combining the NWI-EO (Nursing Work Index – Extending Organizations) questionnaire from the ORSOSA 1 survey (Organisation des Soins et de la Santé des soignants- Organization of Care and Health of Caregivers) [8], the SF-12 (Short Form) quality of life scale questionnaire, and two questions from the French version of the Copenhagen psychosocial questionnaire (COPSOQ) [9].

The NWI-EO questionnaire, used to study the QWL (Quality of work life), is a scientifically validated tool that assesses the levels of psychological and organizational stress perceived by caregivers during work. It consists of 22 questions representing eight dimensions. For each studied dimension, an individual score is calculated. These scores are then averaged by role (nurses or nursing assistants) and compared to a reference value. This threshold value equals the 75th percentile of all the scores measured in the 210 functional units of the ORSOSA 1 survey. If the score obtained is higher than the reference threshold value, the role is considered "at risk" for the studied dimension [10].

The two questions from the COPSOQ were used to determine the existence of a conflict between family life and work. Answers are provided on a 2-degree Likert scale: "agree" and "disagree".

The results of the SF-12 scale, used to study the QOL (Quality of life) outside of work, are presented in the form of two scores: a "physical" quality of life score and a "mental and social" quality of life score. The algorithm used for score analysis yields a physical score ranging from 6 to 28, with the lower half of this score, i.e., <14, indicating poor physical quality of life; a mental score between 8 and 36, with poor mental quality of life indicated if the lower half of the score was below 18. As for the overall quality of life score (SGQV), it ranged from 14 to 64, with a SGQV < 32 indicating poor overall QOL.

2.3. Study variables

The data collected from the questionnaires first consisted of independent variables, including job position and work rhythm components. Secondly, the primary dependent variables were the 8 dimensions of the NWI-EO, the balance between private life and work (how work hours impact private life and how workload impacts private life), and the overall quality of life outside of work.

3. Statistical analysis

The data for this study were entered into the Cs Pro 7.2 software and exported to Excel 2021 for processing. Statistical analyses were performed using SPSS 25 software.

Qualitative variables were presented in tables of frequencies and proportions. Quantitative variables were summarized as means with standard deviations.

For the comparison of proportions, Pearson's Chi-2 test was used. The ANOVA test was employed for the comparison of quantitative variables when the independent variable had at least three modalities. The significance threshold was set at 5%.

RESULTS

1. Socio-professional Characteristics of the Study Population

During the study period, the selection criteria resulted in the inclusion of 700 nursing staff out of the expected 3106, representing a participation rate of 22.5%. This was broken down into 454 nurses (64.9%) and 246 nursing assistants (35.1%). The average age of our population was 39.2 years ± 8.1, with ages ranging from 21 to 60 years. The Sex Ratio (W/M) was 5.1, implying 5 women for every 1 man. Shift work was continuous for 73.9% of the respondents, with a short rotation for 94.6%. Table 1 provides a summary of all the socio-professional parameters.

2. Quality of work life (QWL)

The NWI-EO questionnaire revealed that three dimensions had values exceeding the threshold in more than one-third of our study population: inadequate staff numbers for the work, frequent interruptions during work, and a lack of shared work values. The details are presented in Table 2.

3. Balancing personal and professional life

To the question “My job takes up so much of my time that it negatively impacts my personal life” 53.3% of the nursing staff agreed, while 46.7% disagreed.

Regarding the second question, “My job takes up so much of my energy that it negatively impacts my personal life”,67% agreed, while 33% disagreed.

4. Quality of life outside of work (QLOW)

According to the SF-12, we found a poor quality of life outside of work (SF-12 score <32) in 29 nursing staff, equivalent to 4.1%, while 95.9% had a good quality of life outside of work.

5. Bivariate analysis

5.1. Shift work and quality of work life

Depending on the work schedules, the threshold values of the NWI-EO were presented differently among nurses and nursing assistants.

In the nurse population, regardless of the type of work schedule, the thresholds found in the 8 dimensions were below the reference thresholds. Statistically significant differences were found in the following dimensions: insufficient staffing to carry out the work, frequent interruptions in work, and an organizational structure that does not allow for taking leave. The details are presented in Table 3.

Among the nursing assistants, the dimensions "organization that does not allow for communication," "organization that does not respect leave," and "frequent interruptions in work" had values exceeding the threshold, respectively, in the case of 3X8 schedules for the first two and 2x12 for the third. The observed differences were statistically significant. The details are presented in Table 4.

5.2. Shift work and the balance between personal and professional fife

The relationship between work schedules impacting private life and the characteristics of the work rhythm is presented in Table 5. The 3x8 and 2x12 shift work schedules, continuous and semi-continuous shift patterns, and long rotations significantly and adversely affected the personal lives of nurses.

Regarding the relationship between workload impacting private life and the work rhythm, it is illustrated in Table 6.Nurses working in 2x12 and 3x8 shifts, and those with continuous or semi-continuous work patterns, were significantly more affected in their personal lives.

5.3. Shift work and quality of life outside of work

Based on the overall score obtained with the SF-12, the associations between the characteristics of the work rhythm and the level of quality of life outside of work are presented in Table 7.There is no correlation between the overall quality of life and the work schedule, rhythm, and rotation type. The observed differences were not statistically significant.

DISCUSSION

The quality of work life (QWL) of healthcare staff has gained increased visibility under specific conditions. Upon closely examining the studied population, both among nurses and nursing assistants, we found that the average scores of the eight dimensions of the NWI-EO questionnaire were often below the corresponding alert threshold. Nevertheless, significant percentages above the threshold were observed, especially in dimensions such as "lack of shared values," "insufficient staffing to do the work," and others. These figures suggest that nursing staff deeply feel psycho-organizational constraints (POC). The increased presence of POC undeniably deteriorates the QWL.

Refining the analysis, we highlighted a significant correlation between QWL and certain dimensions of work rhythm among nurses. However, this connection wasn't as predominant among nursing assistants. A trend also emerges staff on 3x8 shifts experience more POC. More specifically, the dimension "organization that does not allow communication" is particularly affected, with team members finding little time for information exchanges. These observations align with existing literature [11-12], confirming that mutual support within nursing teams promotes better QWL.

On the balance between private and professional life, we found that 53% of nursing staff believed their personal life suffers from their job. This observation aligns with the conclusions of researchers such as Pisarski [11] and Prameswari [13], suggesting complications in the personal life of shift workers.According to Kowitlawkul, Singaporean nurses on shift schedules spent more time at work than in their personal lives [14].

However, it is necessary to contextualize some of our findings. While we noted a low percentage of nursing staff complaining about their quality of life outside of work, others, such as Adams [15],

Kraiem [16] and Zaidi [17], reported much higher figures. These differences could be due to reorganizations because of the Covid-19 pandemic or strikes.On this matter, there is no doubt that the Covid-19 pandemic has negatively affected the quality of life of nurses at work, within their families, and also both physically and mentally, as also demonstrated by Dupoirier [18] and Grelier [19].

In conclusion, the QWL of nurses is a multidimensional issue. Our findings, although inherent to our context, align with those of other researchers like Barrau-Baumstarck [20] and Prameswari [13], highlighting the crucial importance of work schedules in the QWL of healthcare staffand especially their negative impact on the quality of life both at work and outside of it for nurses working shift hours and night shifts [21,22].

This study was carried out in the unique health context of the Covid-19 pandemic. Some facilities, due to strikes, had to adopt a minimum service. These changes might influence our findings, introducing a selection bias. However, the prospective nature of this study ensures a degree of reliability to the results, eliminating potential reporting biases. Moreover, the adoption of scientifically recognized questionnaires bolsters the credibility of our research

CONCLUSION

Work-life quality is a crucial issue in the medical sector. It directly influences the performance of healthcare professionals and the quality of care provided to patients. This study has highlighted the psycho-organizational constraints genuinely felt by nursing staff, particularly in terms of frequent work interruptions, insufficient staffing, and hindered communication. These constraints, combined with irregular working hours, seem to significantly disrupt the personal lives of the staff, thereby affecting their overall well-being. However, it's essential to note that despite the considerable challenges faced, most of the nursing staff displayed remarkable resilience. It is imperative for decision-makers, facility managers, and key stakeholders in the health sector to consider these findings to implement improvement measures. Special attention should be given to restructuring schedules, bolstering staffing, and promoting a collaborative and communicative work environment. Only a fulfilled and satisfied nursing staff can ensure quality care for the population.

ETHICAL APROVAL & CONSENT

The study received approval from the Dean's Office of the Faculty of Health Sciences at Marien Ngouabi University (ref: 08/UMNG-FSSA.V.DOY dated March 21, 2021) and from the management of the included hospitals. Informed consents of the participants were sought for the study.

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List of Tables

Table 1: Distribution of nursing staff according to socio-professional characteristics

Variables	Frequencies (n=700)	Percentages (%)
Sex		
Male	115	16.4
Female	585	83.6
Age (years)		
[20 ; 29]	98	14.0
[30 ; 39]	266	38.0
[40 ; 49]	267	38.1
≥50	69	9.9
Work Schedule		
"3x8" Shifts	88	12.6
"2x12" Shifts	466	66.6
Day "7am-2pm"	146	20.9
Continuity of work rhythm		
Continuous	517	73.9
Semi-continuous	78	11.1
Discontinuous	105	15.0
Type of rotation		
Long	38	5.4
Short	662	94.6
Workplace		
Brazzaville	381	54.4
Pointe-Noire	185	26.4
Dolisie	99	14.2
Oyo	35	5.0

Table 2: Distribution of nursing staff based on NWI-EO threshold

Dimensions	Below Threshold	Above Threshold
	n (%)	n (%)
Organization that does not allow communication	586 (83.7%)	114 (16.3%)
Lack of support from health managers	565 (80.7%)	135 (19.3%)
Insufficient staff to perform work	459 (65.6%)	241 (34.4%)
Frequent interruptions in work	467 (66.7%)	233 (33.3%)
Poor relationships within the care and medical team	603 (86.1%)	97 (13.9%)
Lack of shared work values	400 (57.1%)	300 (42.9%)
Lack of administrative support	636 (90.9%)	64 (9.1%)
Organization that does not allow for leave	509 (72.7%)	191 (27.3%)

Table 3: Relationship between the Quality of Work Life (QWL) of nurses and the type of shift work

Dimensions	Threshold	3x8	2x12	7am - 2pm	p-value
Organization that does not allow communication	9.97	8.53	8.22	7.81	0.051
Lack of support from health managers	9.43	7.58	7.69	7.62	0.910
Insufficient staff to perform work	11.25	10.82	10.76	9.39	**0.001**
Frequent interruptions in work	13.22	12.66	13.64	13.18	0.001
Poor relationships within the care and medical team	8.75	7.40	6.96	6.67	0.105
Lack of shared work values	9.24	8.98	8.74	8.50	0.654
Lack of administrative support	13.31	9.53	9.90	9.49	0.247
Organization that does not allow for leave	10.37	9.65	7.40	7.44	**0.000**

Table 4: Relationship between the QWL of nursing assistants and the type of shift work

Dimensions	Threshold	3x8	2x12	7am – 2pm	p-value
Organization that does not allow communication	9.37	**9.43**	8.01	8.31	**0.000**
Lack of support from health managers	9.50	7.87	7.83	7.39	0.49
Insufficient staff to perform work	12.00	10.45	11.23	10.04	0.063
Frequent interruptions in work	12.13	11.84	**13.66**	13.14	**0.000**
Poor relationships within the care and medical team	8.40	7.81	6.31	7.53	0.000
Lack of shared work values	9.37	9.09	7.77	8.33	0.036
Lack of administrative support	12.86	10.64	9.54	9.58	0.019
Organization that does not allow for leave	10.37	**12.09**	7.39	8.54	**0.000**

Table 5: Relationship between work schedule affecting personal life and work pace

Variables	Agree n(%)	Disagree n(%)	p-value
Work Schedule			**0.000**
3x8	**61 (69.3)**	27 (30.7)	
2x12	249 (53.4)	217 (46.6)	
Day(7am – 2pm)	63 (43.2)	83 (56.8)	
Shift Work Rhythm			**0.001**
Continuous	**289 (55.9)**	228 (44.1)	
Semi-continuous	46 (59.0)	32 (41.0)	
Discontinuous	38 (36.2)	**67 (63.8)**	
Type of rotation			**0.009**
Long	**28 (73.7)**	10 (26.3)	
Short	345 (52.1)	317 (47.9)	

Table 6: Relationship between workload affecting personal life and work pace.

Variables	Agree n(%)	Disagree n(%)	p-value
Work Schedule			**0.000**
3x8	52 (59.9)	36 (40.1)	
2x12	348 (74.7)	118 (25.3)	
Day(7am – 2pm)	69 (47.3)	77 (52.7)	
Shift Work Rhythm			**0.000**
Continuous	369 (71.4)	148 (28.6)	
Semi-continuous	47 (60.3)	31 (39.7)	
Discontinuous	53 (50.5)	52 (49.5)	
Type of rotation			**0.209**
Long	29(76.3)	9(23.7)	
Short	440 (66.5)	222 (33.5)	

Table 7: Relationship between the level of Quality of Life Outside of Work and work pace.

	Total score of quality of life outside of work (SF-12)		
Variables	**Poor<32 n (%)**	**Good ≥ 32 n((%)**	**p-value**
Work Schedule			0.627
3x8	2 (2.3)	86 (97.7)	
2x12	21 (4.5)	445 (95.5)	
Day(7am – 2pm)	6 (4.1)	140 (95.9)	
Shift Work Rhythm			0.122
Continuous	26 (5.0)	491 (95.0)	
Semi-continuous	2 (2.6)	76 (97.4)	
Discontinuous	1 (1.0)	104 (99.0)	
Type of rotation			0.630
Long	1 (2.6)	37 (97.4)	
Short	28 (4.2)	634 (95.8)	