Correlations between performance and shift work in the nursing activities: a pilot approach

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Abstract. Background and aim of the work. Performance assessment is a key administrative function and an essential component of organizational quality programs, by quantifying it in relation to set goals, standards, expectations and guides to improvement initiatives. The present study aimed to assess any differences existing in nursing performance levels perceived according to shift work.

Methods. An on-line questionnaire was administered from June to August 2021 through nursing groups present on the Facebook and Instagram pages to all Italian nurses who voluntary agreed to participate. The questionnaire collected both socio-demographic information and nursing performance evaluations, assessed thanks to the “Six-Dimension scale of nursing performance”, such as: leadership, critical care, teaching/collaboration, planning/evaluation, interpersonal relations/communications and personal development.

Results. 305 nurses were recruited in this research. By considering nursing performance according to shift work, significant differences were recorded in the “critical care frequency” sub dimension (p=.001), in the “interpersonal relations” sub dimension (p=.018) and the frequency dimension of the six-dimension scale of nursing performance (p=.018). Meanwhile, as regards the quality sub dimension in the six-dimension scale of nursing performance, none significant differences were reported according to shift variable.

Conclusions. Professional commitment and performance in nursing appeared to be influenced by several organizational factors. Therefore, further studies in this field will be desired with the inclusion of a wide variety of variables, too. (www.actabiomedica.it)

Key words: Nursing, performance, organizational, shift

Introduction

Performance assessment is a key administrative function and an essential component of organizational quality programs, by quantifying it in relation to set goals, standards, expectations and guides to improvement initiatives (1). Several reports of the Institute of Medicine (IOM) emphasized the necessity to assess performance and so to adequately implement it thanks to instrument which could better quantify performance...
in the different healthcare settings. Furthermore, literature highlighted how nurses always represented the largest body of health care professionals and played a crucial role in the health care delivery system (2,3), including both nursing interventions and coordination and administration of all the interventions indicated by physicians and other members of the healthcare team. In this way nurses acted as guardians of health care as well nursing systems served as important leverage points for amelioration. Therefore, literature reported the centrality of nursing in the health care system, but also large gaps in performance appraisal policies (4,5). In fact, most health care practices included general quality performance programs which very often did not include any nursing advantages. Health policies might aim a robust ongoing development in performance measurement system for nursing, as the current set of approved measures did not adequately reflect the complexity of the nursing care system and the range of contributions nursing care by patients (6–8) and, at the same time, it represented an opportunity for the introduction of new performance indicators (9). The development of new measures was restrained by a poor conceptualization of how nursing services were delivered and how they potentially affected patient and organizational outcomes. Since 1978, Schwirian (10) tried to develop a model for nurses’ job performance by defining it as how well the job was done in accordance to established standards. So, job performance was defined as an action that could be observed and assessed (11,12). However, job performance was always a complex phenomenon (13), mostly in the nursing context, in which there were multiple variables which positively influenced nurses’ job performance and at the same time predicted nurses’ job performance (14), as: young age (15), recognition of achievement (16,17), work satisfaction and employee’s educational level and training (12,13), social support (18), supportive communication and feedback (17), and competent nursing practice (19–21). Also nursing experience was important for better performance of jobs. On the other hand, long working shifts and heavy workload (22–25), job stress (18,23), punitive corrective actions and motivational and skill difficulties (11), and older shift workers (23) were reported to negatively influence nurses’ job performance. Additionally, Dubois et al. (26) identified a different conceptual framework for nursing services with a combined total of 51 performance measures. However, no single picture was identified that actually photographed the full aim of nursing services; therefore, each picture was linked to discrepancies in performance assessment. Moreover, nursing performance was largely defined as “the demonstrated ability of an organization or organizational unit to acquire the necessary nursing resources and use them sustainably to produce nursing services that effectively improve patients’ conditions” (26). Literature suggested three subsystems of nursing care, as: the acquisition and implementation or maintenance of nursing facilities; the transformation of nursing resources into nursing services; and the production of changes in patients’ conditions, by highlighting multiple dimensions and hypothesizing inter-functional correlations. Additionally, studies supported that, despite coherent relations between nursing staff assessments and patient outcomes, causal mechanisms by which staff influenced consequences have not been sufficiently explained (6,27–28). Probably, nursing staff, which included the recruitment and assignment of nurses, influenced patient outcomes through the ability to adequately and promptly employ nursing processes. However, this supposed cross-functional relationship could not be considered without clear conceptualizations and strong appraisals of nursing procedures (29). Additionally, literature suggested also the negative effect of night shiftwork in healthcare workers, especially nurses, usually provoking tiredness, sleepiness, humor alteration and weight increase (30–33) and many problems in job performances and psychosocial health (31,34). Night shiftwork, also significantly modified the circadian rhythm of influenced individuals (35). Some studies reported that night shiftwork was correlated to reduced performance (36,37). Although, there were very few evidences concerning the impact of night shiftwork on nurses (37,38) and their consequential challenges in the nursing job performance linked to dissatisfaction and absenteeism (39). However, none of the previous researchers specifically assessed the impact of the night shift work on nursing performance (40). Therefore, the present study aimed to assess any differences existing in nursing performance levels perceived according to shifting work in Italian nurses.
Materials and Methods

The questionnaire

The questionnaire was divided into two main sections. The first part included some socio-demographic information, as:

- sex, between female and male;
- age expressed in years;
- years of work experience, expressed also in years;
- shift work performed, as the interviewee worked only during the morning and the evening (1 or 2 shifts) or also during the night;
- the nursing education level, as the nurse had basic training (3 years), or the interview had post-basic training up to 5 years of nursing training or if the nurse had a consolidated post-basic training exceeding 5 years of training nursing, only considering university nursing education.

In the second section the “Six-Dimension scale of nursing performance” was administered (10,41-42). This questionnaire consisted in a list of activities in which nurses engaged with varying degrees of frequency and skill. It included a total of 52 nurse behaviors grouped into six performance subscales, as: leadership (5 items), critical care (7 items), teaching/collaboration (11 items), planning/evaluation (7 items), interpersonal relations/communications (12 items) and personal development (10 items). The scale was used to obtain self-assessment of performance or perceived adequacy. Specifically, for the first 42 items nurses were invited to answer twice, as the first answer regarded the number that better described how often the interview performed the activities in the performance of the current nursing activity. Therefore, for each item a Likert scale was associated that varied from “1”, as “not excepted in this job” to “4”, as “frequently”. Whereas, the second answer concerned how well nurses performed these activities in the current nursing activity and all the same answers were associated also to a Likert scale which ranged from “1”, as “not very well” to “4”, as “very well”. Additionally, in the second part relating to the quality of the nursing performance perceived, it was included additional 10 items, which regarded the “professional Development” sub dimension. The scale revealed self-evaluations of performance, employer assessments of performance, or perceived adequacy of nursing school training for performance. The condition was composed by the frame and pragmatic validity of the Six-Dimension Scale, and all six sub-dimensions demonstrated high reliability and validity. The instrument was recognized as suitable for performance assessment as well as a helpful research tool (10).

Recruitment and Ethical considerations

All Italian nurses who voluntary agreed to participate in this survey were included. The questionnaire was created and administered thanks to the Google Modules function from June 2021 to August 2021 through some pages and nursing groups present on the following Facebook and Instagram.

All the information collected were treated confidentially, guaranteeing complete anonymity. The study was evaluated and approved by the Ethics Committee of the University Hospital of the Policlinic of Bari, Italy (ID number: 6885/2021).

Data analysis

Data were collected in an Excel spreadsheet and subsequently statistically processed thanks to the IBM statistic SPPS program, version 20.

Categorical variables, such as: sex, shift work typology and instruction levels were reported as frequencies and percentages the continuous variables, such as: age and years of work experience have been assessed with means ($\mu$) and standard deviations (SD). Descriptive analysis, with means ($\mu$) and standard deviations (SD) were also performed for the Six dimension scales, both for the Frequency and Quality dimensions and also t-test for independent sample was performed according to shift variable. All p values < .05 were considered as statistically significant.
Results

305 nurses were recruited in this research. 157(51.5%) were females and 148(48.5%) were males. All socio-demographic characteristics of the respondents were collected in the Table 1.

For each sub-dimension of the Six-Dimension of nursing performance questionnaire means and standard deviations were assessed according to shift variable and t-test for independent sample was performed for each sub dimension (Table 2).

By considering nursing performance according to shift work, significant differences were recorded in the “critical care-frequency” sub dimension (p=.001), as nurses who worked also during the night shift reported higher levels in this aspect (3.49±.39) than nurses who worked only during the daily shift (3.30±.54), respectively. Additionally, nurses who worked during the night shift also reported significantly higher levels in “interpersonal relations-frequency” sub dimension than their daily colleagues (p=.018). Finally, by considering total values in the frequency sub dimension of the six-dimension scale of nursing performance, nurses who worked also during the night shift reported higher levels than their daily colleagues (p=.018). Meanwhile, as regards the quality sub dimension in the six-dimension scale of nursing performance, none significant differences were reported according to shift work variable (Table 2).

Table 1. Socio-demographic characteristics collected (n=305).

| Socio-demographic characteristics | Frequencies (%)<sup>a</sup> µ±s.d.<sup>b</sup> |
|-----------------------------------|-----------------------------------------------|
| **Sex:**                         |                                               |
| Female                           | 157(51.5%)<sup>a</sup>                       |
| Male                             | 148(48.5%)<sup>a</sup>                       |
| **Age**                          | 40.04±12.47<sup>b</sup>                      |
| **Years of work experience**     | 15.50±12.21<sup>b</sup>                      |
| **Shift work:**                  |                                               |
| Daily shift                      | 182(59.7%)<sup>a</sup>                       |
| h-24 shift                       | 123(40.3%)<sup>a</sup>                       |
| **Instruction level in years:**  |                                               |
| Until 3 years                    | 175(57.4%)<sup>a</sup>                       |
| 3-5 years                        | 100(32.8%)<sup>a</sup>                       |
| >5 years                         | 30(9.8%)<sup>a</sup>                         |

Table 2. Nursing performance assessment according to shift work.

| Six-dimension scale sub dimensions: | Daily shift µ± s.d. | h-24 shift µ± s.d. | p-value |
|------------------------------------|---------------------|-------------------|---------|
| **Leadership**                    | 3.34±.46            | 3.40±.49          | .237    |
| **Critical Care**                 | 3.30±.54            | 3.49±.39          | .001<sup>*</sup> |
| **Teaching/Collaboration**        | 3.32±.49            | 3.41±.47          | .099    |
| **Planning/Evaluation**           | 3.34±.50            | 3.46±.48          | .051    |
| **Interpersonal Relations/Communications** | 3.39±.45       | 3.51±.40          | .018<sup>*</sup> |
| **Total**                          | 3.33±.43            | 3.45±.40          | .018<sup>*</sup> |

**Six-Dimensions Quality:**

| Leadership                        | 3.03±.56            | 3.05±.56          | .762    |
| Critical Care                     | 3.06±.56            | 3.05±.50          | .808    |
| Teaching/Collaboration            | 3.05±.45            | 3.06±.45          | .624    |
| Planning/Evaluation               | 3.08±.56            | 3.05±.51          | .643    |
| Interpersonal Relations/Communications | 3.08±.53           | 3.06±.51          | .644    |
| Professional Development           | 3.04±.53            | 3.07±.52          | .583    |
| **Total**                          | 3.06±.48            | 3.05±.44          | .890    |

<sup>*</sup>p<.05 is statistically significant.

Discussion

The present study aimed to assess any differences existing in nursing performance levels perceived according to shift work in Italian nurses, especially if the night shift work could influence the frequency or the quality in the nursing performance appraisal.

The present findings showed that, according to shift work, significant differences were recorded in the “critical care-frequency” sub dimension (p=.001), as nurses who worked also during the night shift reported higher levels in this aspect than nurses who worked only during the daily shift, respectively. Additionally, nurses who worked during the night shift also reported significantly higher levels in “interpersonal relations-frequency” sub dimension than their daily colleagues (p=.018). Finally, by considering total values in the frequency sub dimension of the six-dimension scale of nursing performance, nurses who worked also during the night shift reported higher levels than their daily colleagues (p=.018). Meanwhile, as regards the quality sub dimension in the six-dimension scale of nursing
performance, none significant differences were reported according to shift work variable.

In literature there were no overlapping studies to the present, both for method and purpose. In fact, in the current literature the aspect of nursing performance was a topic characterized by wide complexity of the subject, due to both the important number of nursing services that should be considered, areas of application that are vast in the entire health organization of any country all around the world. In this regard, the World Health Organization considered nurses to be one of the most important work forces in the healthcare sector, as nurses played a vital role in the supply of healthcare worldwide, connecting to the productivity and quality of care provided by healthcare institutions (43). Therefore, nurses could be considered as the starting point of healthcare systems and might be provided with the best conditions allowing them to achieve their tasks in the best possible way (10,41-42). In fact, the success of healthcare organizations depended on several significant elements and nurses’ devotion to their organizations played an essential role, which helped the organization in realizing its goals, encouraging organizational efficiency and effectiveness and developing the quality of healthcare services. However, the 2030 Agenda for sustainable development goals (SDGs) report indicated that nursing staff was understaffed and unbalanced distributed (10).

Our data supported evidence demonstrated in the scientific literature, as nursing performance in the frequency dimension differentiated both in the critical care, interpersonal relations and also in the total dimension of frequency of the nursing performance scale, reported significant higher levels than the other colleagues who worked only during the daily shift (44). In this regard, high stressful nursing job (45) influenced the physical, mental, and awareness skills of the individual. In fact, nurses who performed long hours (46), were stressed or sleep deprived (47,48), supporting heavy workloads (49-51). All these aspects negatively influenced nursing performance during their job hours and affected the timely provision. Anyway, all the literature reviewed were in agreement to consider that the nursing performance was poorly defined in the literature in terms of skills, nursing-sensitive quality indicators, and task-specific performance assessments (1). Moreover, literature reviews encouraged research in shift work research approach and methodology, by comparing studies available (52) and searching more information which could benefit the nursing management, too (53).

Conclusions

Managerial interventions will be need to improve nursing performance. Moreover, professional nursing commitment and performance appeared to be influenced by several organizational factors; therefore, further studies in this field will be desire with the inclusion of a wide variety of variables (54). Although the present study could be considered pilot for method and purpose, it will be necessary to perform further studies that will include a larger sample size in participants to generalize data and the trend between nursing performance and shift work.

Finally, the present findings might offer useful information for nursing leaders. For example, with regard to the significant predictors obtained from the current analyses. However, literature suggested that there was no perfect schedule (55) and recommendation should be pertinent to specific groups and work systems. It is to be noted that each setting has its own specific requirements.

References

1. DeLucia PR, Ott TE, Palmieri PA. Performance in Nursing. Rev Hum Factors 2009; 5(1):1-40.
2. Vitale E, Notarnicola A, Moretti L, Esposito A, Moretti B. The quality of health care perceived by orthopedic patients in the General Hospital of Polyclinic in Bari: an observational-validation study. Minerva Ortop Traumatol 2021; 72(2): 219–226.
3. Madlabana CZ, Mashamba-Thompson TP, Petersen I. Performance management methods and practices among nurses in primary health care settings: a systematic scoping review protocol. Syst Rev 2020; 9:40.
4. Brown S. A centralized system to access acute healthcare services: the pros and cons. Health Manage Forum 2005; 18(2):34-7.
5. DeNisi AS, Murphy KR. Performance appraisal and performance management: 100 years of progress? J Appl Psychol 2017; 102(3): 421–433.
6. Needleman J, Kurtzman ET, Kizer KW. Performance measurement of nursing care: state of the science and the current consensus. Med Care Res Rev 2007; 64(2 Suppl):105-43S.

7. Kurtzman ET, Jennings BM. Capturing the imagination of nurse executives in tracking the quality of nursing care. Nurs Adm Q 2008; 32(3):235-46.

8. Richle AI, Hanold LS, Sprenger SL, Loeb JM. Specifying and standardizing performance measures for use at a national level: implications for nursing-sensitive care performance measures. Med Care Res Rev 2007; 64(2 Suppl): 64S-81S.

9. Kelley J, Simmons B. Introduction: The Power of Global Performance Indicators. International Organization 2019; 73(3): 491-510.

10. Schwirian PM. Evaluating the performance of nurses: a multidimensional approach. Nurs Res 1978; 27(6):347-51.

11. McConnell CR. The manager's approach to employee performance problems. Health Care Manag (Frederick) 2003; 22(1):63-9.

12. Popovich JM. Multidimensional performance measurement. J Nurs Care Qual 1998; 12(4):14-21.

13. Tzeng HM. Nurses' self-assessment of their nursing competencies, job demands and job performance in the Taiwan hospital system. Int J Nurs Stud 2004; 41(5):487-96.

14. Wright TA, Bonett DG. The moderating effects of employee tenure on the relation between organizational commitment and job performance: A meta-analysis. J Appl Psychol 2002; 87(6): 1183–1190.

15. Cronin SN, Becherer D. Recognition of staff nurse job performance and achievements: Staff and manager perceptions. JONA 1999; 29(1): 26–31.

16. Fort AL, Voltero L. Factors affecting the performance of maternal health care providers in Armenia. Hum Resour Health 2004; 2(1):8.

17. AbuAlRub RF. Job Stress, Job Performance, and Social Support Among Hospital Nurses. J. Nurs. Scholarsh 2004; 36: 73-78.

18. Meretoja R, Bechini I. Indicators for competence, job demands and job performance in the Taiwan hospital system. Int J Nurs Stud 2004; 41(5):487-96.

19. McCollom CR. The manager's approach to employee performance problems. Health Care Manag (Frederick) 2003; 22(1):63-9.

20. Popovich JM. Multidimensional performance measurement. J Nurs Care Qual 1998; 12(4):14-21.

21. Meretoja R, Leino-Kilpi H. Comparison of competence assessments made by nurse managers and practising nurses. J Nurs Manag 2003; 11(6):404-9.

22. Vitale E, Lupo R, Calabrò A, Cornacchia M, Conte L, Marchisio D, Caldararo C, Carvello M, Carricero C. Mapping potential risk factors in developing burnout syndrome between physicians and registered nurses suffering from an aggression in Italian Emergency departments. Psychopathology 2021; 27:148-155.

23. Vitale E, Cesano E, Germini F. Prevalence of Burnout among Italian Nurses: a descriptive study. Acta Biomed 2020; 91(4): e2020117.

24. Mrayyan MT, Al-Faouri I. Career commitment and job performance of Jordanian nurses. Nurs Forum 2008; 43(1):24-37.

25. McCloeskey JC, McCain B. Variables related to nurse performance. Image the J Nurs Scholarsh 1988; 20(4):203-207.

26. Dubois CA, D’Amour D, Pomey MP, Girard F, Brault I. Conceptualizing performance of nursing care as a prerequisite for better measurement: a systematic and interpretive review. BMC Nurs 2013; 12:7.

27. Blegen MA, Goode CJ, Spetz J, Vaughn T, Park SH. Nurse staffing effects on patient outcomes: safety-net and non-safety-net hospitals. Med Care 2011; 49(4):406-14.

28. Kane RL, Shamlayan TA, Mueller C, Duval S, Wilt TJ. The association of registered nurse staffing levels and patient outcomes: systematic review and meta-analysis. Med Care 2007; 45(12):1195-204.

29. Oner B, Zengul FD, Oner N, Ivanкова NV, Karadag A, Patrician PA. Nursing-sensitive indicators for nursing care: A systematic review (1997-2017). Nuns Open 2021; 8(3):1005-1022.

30. Books C, Coody LC, Kauffman R, Abraham S. Night shift work and its health effects on nurses. Health Care Manag 2020; 39(3): 122–127.

31. Ferri P, Guadi M, Marcheselli L, Balduzzi S, Magnani D, Di Lorenzo R. The impact of shift work on the psychological and physical health of nurses in a general hospital: A comparison between rotating night shifts and day shifts. Risk Manag. Healthc. Policy 2016; 9: 203.

32. Giorgi F, Mattei A, Notarnicola I, Petrucci C, Lancia L. Can sleep quality and burnout affect the job performance of shiftwork nurses? A hospital cross-sectional study. J Adv Nurs 2018; 74(3): 698–708.

33. Siqueria K, Grieb R, Rotenberg L, Silva-Costa A, Mendes da Fonseca MDJ. Weight gain and body mass index following a change from daytime to night shift—a panel study with nursing professionals. Chronobiol Int 2016; 33(6): 776–779.

34. Van Dam SR. The impact of 12-hour shifts on nurses’ health, wellbeing and job satisfaction: A systematic review. J Nurs Educ Pract 2017; 7(11).

35. Kerkhof GA. Shift work and sleep disorder comorbidity tend to go hand in hand. Chronobiol Int 2018; 35(2): 219–228.

36. Han K, Trinkoff AM, Geiger-Brown J. Factors associated with work-related fatigue and recovery in hospital nurses working 12-hour shifts. Workplace Health Saf 2014; 62(10): 409–414.

37. Niu SF, Chu H, Chen CH, Chung MH, Chang YS, Liao Y., Chou KR. A comparison of the effects of fixed-and rotating-shift schedules on nursing staff attention levels: A randomized trial. Biol Res Nurs 2013; 15(4): 443–450.

38. Dall’Ora C, Ball J, Recio-Saucedo A, Griffiths P. Characteristics of shift work and their impact on employee performance and wellbeing: A literature review. Int J Nurs Stud 2016; 57: 12–27.

39. Burch JB, Tom J, Zhai Y, Criswell L, Leo E, Ogoussan K. Shiftwork impacts and adaptation among health care
workers. Occup Med 2009; 59(3): 159–166. doi:10.1093/occmed/kqp015
40. Alsharari AF, Abuadas FH, Hakami MN, Darraj AA, Hakami MW. Impact of night shift rotations on nursing performance and patient safety: A cross-sectional study. Nurs Open 2021; 8:1479–1488.
41. Al-Haroon HI, Al-Qahtani MF. Assessment of Organizational Commitment Among Nurses in a Major Public Hospital in Saudi Arabia. J Multidiscip Healthc 2020; 13:519–526.
42. Kyong-ok P, Young-mee A, Na-rae K, Mi-jin L, Min S. Psychometric Evaluation of a Six Dimension Scale of Nursing Performance and Student Nurse Stress Index Using an Objective Structured Clinical Examination - Modules for Asthma and Type 1 Diabetes. Child Health Nurs Res 2013; 19(2): 85.
43. United Nations. Department of Economic and Social Affairs. Sustainable Development Goals. Available at: https://www.un.org/sustainabledevelopment/ Accessed on July 15, 2021;
44. Needleman J, Kurtzman ET, Kizer KW. Performance Measurement of Nursing Care. Med. Care Res Rev 2007; 64(2_suppl):10S–43S.
45. Golubi, R, Milosevic M, Knezevic B, Mustajbegovic J. Work-related stress, education and work ability among hospital nurses. J Adv Nurs 2009; 65(10): 2056Y2066.
46. Rogers AE, Hwang WT, Scott LD, Aiken LH, Dinges DF. The working hours of hospital staff nurses and patient safety. Health Aff 2004; 23(4): 202Y212.
47. Dorrian J, Tolley C, Lamond N, van den Heuvel C, Pincombe J, Rogers AE, Drew D. Sleep and errors in a group of Australian hospital nurses at work and during the commute. Appl Ergon 2008; 39(5): 605Y613.
48. Geiger-Brown J, Rogers VE, Trinkoff AM, Kane RL, Bausell RB, Scharf SM. Sleep, sleepiness, fatigue, and performance of 12-hour shift nurses. Chronobiol Int 2012; 29(2): 211Y219.
49. Aiken LH, Clarke SP, Sloane DM, Sochalski J, Silber JH. Hospital nurse staffing and patient mortality, nurse burnout, and job dissatisfaction. JAMA 2002; 288(16): 1987Y1993.
50. Montgomery VL. Effect of fatigue, workload, and environment on patient safety in the pediatric intensive care unit. Pediatr. Crit. Care Med 2007; 8(2, Suppl.): S11YS16.
51. Hayes C, Jackson D, Davidson PM, Power T. Medication errors in hospitals: A literature review of disruptions to nursing practice during medication administration. J Clin Nurs 2015; 24(21Y22): 3063Y3076.
52. Kantermann T, Juda M, Vetter C, Roenneberg T. Shiftwork research: Where do we stand, where should we go? Sleep Biol. Rhythms 2010; 8:95105.
53. Sivesind V. Effects of Shift Length on Nursing Staff’s Productivity, Safety, and Well-being. Nursing - Senior Theses 2020, 5.
54. Kalhor R, Khosravizadeh O, Moosavi S, Heidari M, Habibi H. Role of Organizational Climate in Job Involvement: A Way to Develop the Organizational Commitment of Nursing Staff. J Evid Based Integr Med 2018; 23:2515690X18790726.
55. Abdalkader RH, Hayajneh FA. Effect of night shift on nurses working in intensive care units at Jordan University Hospital. Eur J Sci Res 2008; 23:7086.

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