The Benefit of Shift Work Schedules for Nurses' Outcome: A Sytematic Review

Mahmud Ady Yuwanto[1]

[1]*Nursing Departement, Faculty of Health Sciences, Universitas dr. Soebandi, Jember, Indonesia*
Corresponding author: ashadanh@gmail.com

ABSTRACT

Background: the nurse scheduling problem (NSP) is a serious and complex challenge in the medical industry. Effective, efficient, and high-quality services must be carried out by nurses in hospitals.

Purpose: the goal of the systematic review was to find out how nurses have a positive impact on shift schedules on professional nurses in hospitals.

Methods: employed the PRISMA approach. Electronic search engines from Proquest, Science Direct, and Ebsco were used to locate pertinent publications. Only English-language publications released between January 1, 2019 and December 31, 2021, had an inpatient hospital focus.

Results: after identifying 265 references initially, duplicates were eliminated, and then authors from 6 pertinent papers were chosen. Overall, nurses reported that 12-hour shifts had a favorable impact on retention, including "the ability to retain experienced staff." Most nurses are flexible, don't get too tired, and will respond to patient requests like "better handoff" and "improvement of morale",

Conclusion: given that shift nurses are supposed to work about 37 hours per week and that 12-hour shifts are popular (i.e., three shifts of 12-hours). Nurse managers may think about taking action to assist nurses in reducing potential job stress brought on by the need to work shifts in order to maintain patient care. More investigation is required.

Keywords:
Nurse scheduling problem; shift work; nurse outcomes; nursing quality.

BACKGROUND

Hospitals must maintain a record of each day of the week. Officers who log their hours and demand irregular shifts will have a significant effect on their own lives. There is a shortage of nurses in a number of nations, which raises the requirement for welfare administration processes, which are essential for duty performance. One of the potential and long-lasting advantages to the officer's functioning state is the availability and variety of nurse requests in their schedule (Rönnberg et al., 2013).

Nurture rostering issues are another name for nurse scheduling issues (NSPs). Choosing a medical caregiver's schedule during a specific time when the NSP is NP-hard is the fundamental test for NSP (Alharbi, 2018). The goal of NSP is to ascertain whether there has been a change in the nursing staff over a specific time frame (weekly or monthly) (Van den Bergh et al., 2013).

The largest scheduling issue that hospitals nationwide are experiencing is NSP (Wu et al., 2013). The issue of NSP booking, which is incredibly unpredictable, should be resolved by providing nurses with schedules for their work shifts. The resolution of the NSP is fraught with several challenges. Regarding these restrictions, it is important to distinguish between rigid standards and delicate specifications, which can refer to both institutional policies and individual nurse preferences. "If these planning criteria can be properly resolved, it can influence the type of health administrations provided. So, every hospital's nurse manager should be responsible for establishing plans. The preferences of a nurse should be taken into consideration in order to have a reasonable timetable (Baskaran et al., 2014).

Nurse scheduling takes shift work and occasions into account in order to ensure that all combinations of movements and occasions can meet all labor force requirements for each shift, including the total number of staff members, the base number of daily staff members, and a certain number of staff members. Seniors are required throughout training, and each staff member should receive the required number of vacation days (Felici & Gentile, 2004).

There are only a few basic types of shift employment and situations under which a shift might be booked. The two most common ones are the 2-shift turn (12-hour day shift and 12-hour night shift) and 3-shift revolution (for example 8 hour day shift, 8-hour evening movement, and 8-hour night shift). Traditional holidays allow nursing personnel to take a break, and each member of the nursing staff is eligible for an equal number of days off (Purnomo & Bard, 2007; Van den Bergh et al., 2013). Due to differences in each nurse's personal lifestyle and varying levels of physical endurance on long workdays, each nursing staff member often has a different preference for their shift work and situations.

OBJECTIVE

The purpose of this analysis is to describe the positive impact of shift schedules on professional nurses in hospitals.

METHODS
Study Design
The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) were used in the current study.

Search strategy
Important scientific journal articles and science are found via looking through the electronic web search tools of Proquest, Ebsco, and Science Direct. The PICOS question + L (P = population, I = intervention, C = comparators, O = outcomes, S = study design, L = language) format was used for formulating the research question (Table 1). The boundaries of the review question were defined through the development of inclusion and exclusion criteria using the PICOS format. Studies were included for review if they met the following inclusion criteria: (1) All types of quantitative and qualitative study whether mixed methods (qualitative and quantitative study); (2) The results obtained for solving the nurse's scheduling problem. For the search, keywords were formulated with the aid of Boolean operators for combinations of words, for searches performed in CINAHL and Medline, using MeSH terms AND, OR, and NOT. The search strategy was established as: "*shift work*', AND "*schedule*", AND "*nurse*", AND "*patient*", AND "*outcomes*". Only English publications released between January 1, 2019, and December 31, 2021 are accepted. The deadline was established because researchers needed the most recent research to build their theoretical frameworks for nursing and healthcare practice. Book reviews and chapters are not included. We anticipated that the data on nurse scheduling issues would be quite heterogeneous.

Table 1. The PICOS format of this study

Criteria	Inclusion	Exclusion
Population	A nurse in hospital patient unit	Health workers are other than nurses and home health care
Intervention	Nurse shift work schedule	Studies reporting educational interventions
Comparators	No comparison	
Outcomes	Nurse outcome and patient outcome	There is no improvement in the nurse scheduling problems
Study Design and publication type	Including all observational studies (e.g. cohort analytic studies, cross-sectional studies, case-control studies), RCTs, Controlled Clinical Trials (CCTs). Scholary Journal	Thesis/dissertations, conference papers, proceedings, systematic review.
Publication years	2019 until 2021	Pre-2019
Language	English	Language other than English

Study Selection
The fundamental screening involved examining the article titles, digests, and ends to determine whether the content reflected the goals of the methodical writing audit. Looking through the text, as previously illustrated, led to connections between scholarly

journal entries and significant friend inspections. Following a technique of duplicate research, review titles, and article abstracts, authors were separately discovered. As a result, basic reading was done and full-content articles were studied as suggested by consideration models.

Quality Assessment

A risk assessment is performed by adhering to the PRISMA for analysis's bias-right and gradual systematic criteria. Independently, the author selects abstract and title articles, finishing and analyzing those that meet the requirements for inclusion. Data from the study, such as the types of interventions, the sample size, the design of the study, and the research findings, were gathered.

Each method consists of research design, place and time of research, population and samples, data measurement, and data analysis methods. Please provide sufficient details of the methods, including ethical conduct.

RESULTS

Initially, 265 references were identified, then, after the elimination duplicates, authors selected 6 relevant studies (Figure 1).
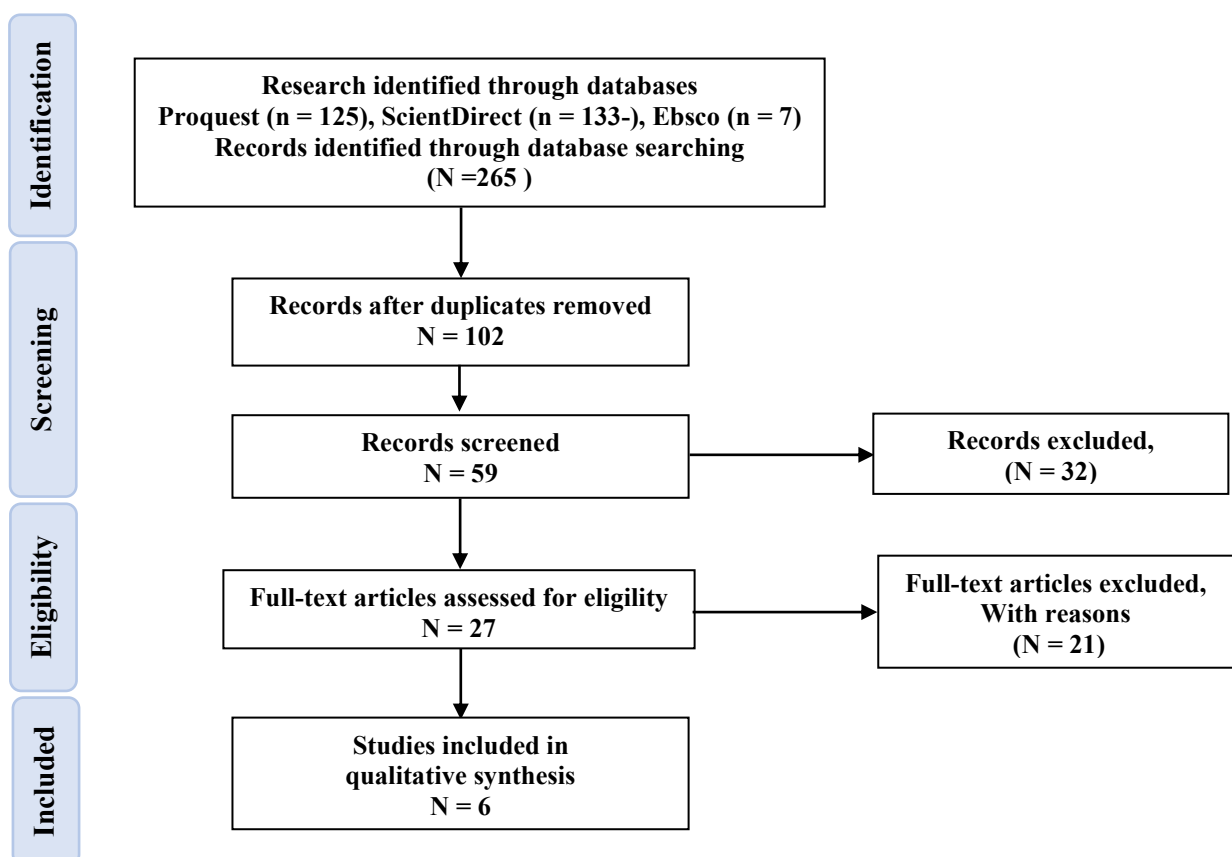
Figure 1. Flowchart Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement

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Table 2. Result of literatures

Authors and years	Aim	Design	Study population	Summary of findings
Thun et al., (2021)	To investigate the relationship between self-reported everyday memory problems the last month, and: (a) shift work schedule, (b) night shifts and quick returns worked the last year, and (c) sleep duration the last month	A quasi-experimental study	In all, 1,275 nurses completed the Everyday Memory Questionnaire revised, and answered questions about shift work exposure and sleep duration.	High openness to speedy returns and short rest term were both emphatically connected with memory issues, while shift work plan, long rest span, night shift openness, and low and moderate openness to fast returns were not.
Emmanuel et al. (2020)	To examine the relationship between $\geq$ 12-hour shifts, overtime, and lower staffing levels and opportunities for completing ancillary work	A Cross-sectional survey	2990 registered nurses. Nurses were asked to report the number of hours worked, full time/part time status, and the period of the day (day/afternoon/evening) on their last shift.	When compared to $\leq$ 8 hour shifts, nurses working $\geq$ 12-hour shifts were less likely to report having staff education programs.
Stimpfel et al. (2020)	To describe sleep duration and work characteristics among registered nurses ("nurses") across health care settings and unit types and determine the association between sleep duration and quality of care and patient safety	An observational, retrospective design	Nurses working in a staff or general duty position (N=1,568)	Nurses reported an average of 414 minutes, or just less than 7 hours, of sleep before a work day and 497 minutes, or just over 8 hours, before a nonwork day. Short sleep duration was statistically significantly associated with lower ratings of quality of care and patient safety

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Authors and years	Aim	Design	Study population	Summary of findings
Yu et al. (2019)	To assess 12-h shift Intensive Care Unit (ICU) nurses' fatigue and identify the associated demographic factors	A cross-sectional survey	67 ICU nurses working 12-h shifts was undertaken to determine their fatigue levels in two hospitals	57 out of 67 participants experienced low to moderate chronic fatigue; 36 of those exhibited low moderate acute fatigue levels; 46 reported low to moderate inter-shift fatigue.
				Age (ρ = number of family dependents and years of nursing experience were moderately negatively correlated with acute fatigue, while frequency of exercise per week was moderately negatively correlated with chronic fatigue. Hospital A had higher chronic fatigue levels than Hospital B. Age, shift schedule and nursing experience were significantly related to the difference in chronic fatigue levels between the two hospitals
Webster et al. (2019)	To investigate the effect on nurses and patients of 8-h rostering compared with 12-h rostering	A quasi-experimental study conducted a two-phase survey. Phase 1 was conducted during 2015, while the 8-h shift pattern was in place. Data for phase. 2 were collected in 2017, approximately 6 months after the trial of 12-h shifts began	Of the 193 surveys distributed in phase 1, a total of 152 (78.8%) were returned. In phase 2, 188 surveys were distributed and 114 (60.6%) returned. Consequently, 266 responses were included in the analysis. A total of 209 (78.6%) respondents were female and 98 (36.8%) were employed full time, which means that they were employed for more than 72 h/fortnight. Most respondents (205, 77.1%) were registered nurses.	The proportion of nurses satisfied with the roster increased 3-fold after the introduction of 12-h shifts; risk ratios. Communication with all levels of senior staff improved, and the number of hours of professional development leave increased with the 12- h roster phase 1, 358 h versus 538 h in phase 2. Most respondents believed that 12-h shifts would be beneficial for their health, and this belief was validated by official leave records

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Authors and years	Aim	Design	Study population	Summary of findings
Ose et al. (2019)	To provide recommendations to hospital owners and employee unions about developing efficient, sustainable and safe work-hour agreements. Employees at two clinics of a hospital, one a non-intensive care and the other a newborn intensive care unit (ICU), trialled 12-hour shifts on weekends for 1 year	A qualitative study	Recorded the experiences of 24 nurses' working 12-hour shifts, 16 in the medical unit and 8 in the ICU for 1 year. All were interviewed before, during and at the end of the trial period. The interview material was recorded, transcribed to text and coded systematically	The experiences of working 12-hour shifts differed considerably between participants, especially those in the ICU. Their individual experiences differed in terms of health consequences, effects on their family, appreciation of extra weekends off, perceived effects on patients and perceived work task flexibility

The amount of sleep that nurses get before work is less than recommended, which will have an impact on their performance and day-to-day memory at work. Therefore, nurses' health, performance, and daily memory will all be improved by the nurse manager's improved scheduling of work shifts and time off (Stimpfel et al., 2020; Thun et al., 2021).

Work preferences for nurses Their health, family circumstances, workload tolerance, the severity of their sleep issues, personality, and other characteristics all have a role in whether they can perform 12-hour shifts. In order to attract and keep nurses, they should be given the option to work 12-hour shifts. Less opportunity to do additional work may be related to 12-hour shifts, melting, and smaller worker counts. Due to the shortage of nurses and the detrimental effect on both the welfare of patients and nurses, long shifts lasting 12 hours may be advised by the appropriate policymakers (Emmanuel et al., 2020; Ose et al., 2019).

Overall, nurses claimed that 12-hour shifts would have a good impact. The opportunity to keep experienced employees on staff is one of the reasons given by nurses as to why the scheduled 12 hours will boost retention. Other benefits of the 12-hour shift that most nurses work include "better handovers" and "improved morale," which would mostly benefit patients. The majority of nurses working 12-hour shifts report just mild to low degrees of weariness, demonstrating the nurses' high level of adaptability to 12-hour hours. However, management and nurses should collaborate to provide a mixed shift schedule for junior nurses while keeping senior nurses on the job to lower chronic

fatigue levels. This suggests that some help should be given to younger and/or less experienced nurses (Webster et al., 2019; Yu et al., 2019).

DISCUSSION

We evaluate the effects of the shift design changes on the correspondence between the various nursing staff degrees incredibly quickly. Good communication is essential for patient safety (Mujumdar & Santos, 2014).

Additionally, we have seen the study on the 12 hour list of weaker communication. The results indicate an improvement in the ability to communicate with staff members at all levels of ranking. Therefore, this concern is unfounded. The expansion is probably due to the attendants' having greater flexibility in how they schedule their work, giving them more chances to interact with their medical caregiver pioneers, attend group events, and participate in the activities of other units. Two samples of nurses employed under the list of 12 hours; there is no comparison with those working under a schedule of 8 hours, and two trials with minor negative outcomes (36 nurses in one study and 54 in other studies) are why we believe our results differ from the others (McGettrick & O'Neill, 2006; Ugrovics & Wright, 1990).

Nurses typically work 12-hour shifts. It is not surprising to learn that the average nurse works about 37 hours per week (three 12-hour shifts) and about 7 hours extra per week. A shift overrun or working a significant amount of a shift to fill a staff opening can result in extra time. Despite the fact that we found genuinely significant differences in working hours by work setting and unit specialization, these differences were not significant enough to support practices or strategy modifications in a particular unit or a specific context (Webster et al., 2019).

While proponents of lengthier 12-hour shifts frequently argue that enlarged handovers and covering movements of three changes in an 8-hour framework are "inefficient" and possibly dangerous, it is clear from these results that significant work should be feasible during this time. Even while there is some anecdotal evidence that part of the staff prefers lengthy moves to maintain a balance between serious and enjoyable activities, these discoveries are just the latest in a long line of evidence that undermines any argument that the usefulness has increased (Yu et al., 2019).

Notably, very few tests have considered patient outcomes while evaluating the effects of 12-hour shifts. Rates were comparable in the two periods when we grilled responses to our register of hostile incidents, suggesting that shift length had almost no effect on quiet outcomes. Additionally, our negative event rates were significantly lower than those reported by a similar population (Stimpfel et al., 2020).

This investigation has found a link between prolonged weakness and the "recurrence of activities each week." This highlights practice as a key element linked to reducing the ongoing weariness of medical staff members when working 12-hour shifts. Additionally, it suggests that participants should have enough downtime between three or four consecutive 12-hour shifts so they may fit in an extra activity each day. This can

help medical professionals develop better lifestyles to lessen work pressure, hence reducing their levels of persistent weakness (Samaha et al., 2007).

The recovery process isn't complete if we consider the nurse's schedule, which frequently entails a few consecutive 12-hour shifts and sometimes a brief period of downtime in between shifts. In fact, a study of medical assistants on work stress, rest, sluggishness, and weariness discovered that inter-shift recovery was poorer. In addition, the differences across individuals showed that some nurses were more likely to consider slips. In order to improve safety measures, more research will be done to find out why attendants have a high workload, short breaks, are weak, and don't do a good job.

CONCLUSION

Nurses are renowned for working 12-hour shifts. As longer working hours were combined with fewer working days, problems with health care, influence on recreation and daily life, and personal happiness all improved. Additionally, fewer days are lost due to illness and parental leave, and patient outcomes are not jeopardized. Given that most nurses work 12-hour shifts and that it is recommended that nurses work about 37 hours each week (i.e., three movements of 12 hours). Nurse managers may think about taking action to assist nurses in reducing potential job stress brought on by the need to work shifts in order to maintain patient care. More investigation is required.

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