

Effect of Hospital unit physical setting on Nurses workload and quality Patient care: Nurses Perspective

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Abstract

Aim: The study aims to investigate the relationship between the unit's physical setting and its effect on the nurse's workload and patient care. This study may help to improve the quality of patient care, patient satisfaction, and nurse satisfaction.

Methods: A cross-sectional quantitative explorative study conducted in the medical units using questionnaires among nurses with a convenience sampling method recruited from general male and female medical ward which has the same geographical setting of the units.

Results: Total of 85 nurses responded in this study. The findings of this study demonstrate the linkage between the physical layout of the nursing unit with the nurse's workload and quality patient care. The result of our study suggests that the unit's physical layout has a significant impact on the nurse's workload and quality patient care. The nurses perceive that the setting is not supportive in planning and organizing nursing care effectively, conducting patient monitoring and timely response to patient needs. The study also established that the current setting may lead to adverse patient outcomes, constraint effective teamwork, multidisciplinary communication, and decrease staff satisfaction.

Conclusion: The physical setting of the unit and patient distribution has a great impact on nurses' workload. As the outcome of disorganized physical layout, nurses could be physically strained and exhausted which may affect the quality of care provided to the patients.

Keywords: Hospital unit physical setting; Nurses workload; Quality patient care; patient safety; teamwork; communication; Nurses perspective

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I. Introduction

The clinical setting or physical layout of the unit in the hospital plays an important role in nurse's workload and the nursing care provided. The basic ward design principles include natural light, ventilation, cleanliness and the physical arrangement of beds. Our study focuses on factors in unit design which include total bed capacity, patient distribution, resource allocation, and patient monitoring and accessibility. A study by Hurst(1) discussed Nightingale ward, which identified the efficient and effective hospital wards that brought together all that needed for patient care in one place, allowed patient-staff allocation based on patient dependency and facilitated close supervision.

The physical environment is necessary and needs to be aligned so that the caregivers and the resources that support them are set up for enabling safe care. Studies found there was a link between the physical environments and patient outcomes and staff outcomes e.g., reduced stress and fatigue and increased effectiveness in delivering care(2). An efficient hospital layout should promote staff efficiency by minimizing the distance of necessary travel between frequently used spaces, allow easy visual supervision of patients by limited staff and include all needed spaces, but no redundant ones (3). Studies also found nurses have to spend most of the time with or near to patients to provide better patient care (4). Another similar study found the negative impact of increased walking time by nurses, on patient care(5). The work efficiency in a nursing unit is affected by, the distance nurses need to travel to provide care which is related to the number and placement of centralized or decentralized nursing workstations(6). Functional design can promote skill, economy,

conveniences, and comforts; a non-functional design can impede activities of all types, detract from the quality of care, and raise costs to intolerable levels (7).

The study aims to investigate the relationship between the unit's physical setting and its effect on the nurse's workload and patient care. This study may help to improve the quality of patient care, patient satisfaction, and nurses' satisfaction.

II. Methods

A cross-sectional quantitative explorative study conducted among nurses working in the medical units for more than six months. The nurses were recruited using a convenience sampling method from general male and female medical wards, which has the same geographical settings. Each unit has a bed capacity of 62, distributed in three wings around the station. This high number of bed capacity is one of the reasons that could be attributed to an increase in staff workload and decrease quality patient care. The beds are allocated as single rooms, double bedded rooms, and four-bedded rooms. The single rooms are at the farthest end and even patients that need critical care are admitted in these rooms. The unit has only one supply storeroom, one equipment room, and one linen room and it finds difficult for the nurses to access supplies and equipment. The patient distributions in these units are based on bed availability, infections and patient request except three beds for patients requiring chemotherapy. Also, these units are having a high number of bedridden patients scattered in different areas of the units, which also makes it more difficult for the nurses to provide optimal patient care. Therefore, the nurse's allocation cannot be made successively to have fairness in allocation according to patient acuity which increases the distance they walk each time and prevent the nurses from proper patient monitoring. The patient bed allocation in these units is not based on patient acuity or type of care or specialty which affects nurses' workload and patient care. Also, the distance each nurse walks in these units every shift is quite significant due to the scattered patient allocation and centralized nurse's station system. The study obtained ethical & hospital approval and the nurses' verbal consent before responding to the questionnaire.

III. Results

Total of 85 nurses from medical units responded in this study. The study findings showed that most of the nurses (72.6%; n=61) agreed that the unit is not comfortable to work. They also agreed that there were direct and indirect effects for the workload on job outcomes effectiveness. The unit setting increases physical strain due to the distance of walking. The study also established that nurses are unable to plan and organize nursing care effectively (73.8 % n=62) and to conduct patient monitoring or close observation timely (71.4%; n=60). Most of the nurses (82.1%; n=69) found it difficult to work as a team in the unit effectively, make multi-disciplinary referral/paging efficiently (70.2%; n=59) and to have effective communication with the colleagues (58.3% n=49).

Findings also established that the setting did not help prevent hospital-acquired injury to both patient and staff (59.5%; n=50). The results also show that the current setting may lead to; increase falls (94%; n=79), increase infection rate (73.8%; n=62), increase pressure ulcer (65.5%; n=57) and may increase in elective intubation (67.9%; n=57). Furthermore, the study reveals that the medication process (76.2%; n=64) and patient observations/monitoring could not be done effectively in this setting (72.6%; n=61).

The study concluded that nurses are unable to provide better quality nursing care to their patients (81 %; n=68), not satisfied working in current setting (77.4%; n=65) and units are not conducive to work (73.8 %; n=62). Also, the study stated that working ability and unit work assignments are not balanced (72.6 %; n=61).

IV. Discussion

1. Physical layout and Nurses Workload

The result of our study suggests that there is a significant impact on the unit's physical layout on the nurse's workload. The nurse's perception was based on the background of a unit with 62-bed capacity distributed in three wings connected to a central station. Each wing has four single rooms and four double-bedded rooms. Besides, there are six four-bedded rooms and one two-bedded room around the station. The unit is equipped with only one supply store, equipment and linen store located near the central station.

This study established that the current physical setting of these units is not supporting the nurses to perform their tasks effectively and it also has led to an increase in nurses' workload. In these setting, nurses have to walk long distances between nurse's station and patient rooms, access to supplies, equipment, medications, patient charts, computers, etc. which cause strain and fatigue on nurses and affect nurse's performance.

These findings are supported by numerous studies, which show the nurse's workload and its strong relationship with the physical and organizational structure of the unit (8, 9). Another study identified factors that led to high workload as the distance between patients' rooms, spending a lot of time searching for patients' charts, find other staff members and a crowded and disorganized work environment (10). Similarly, a study found that nurses spend time walking around the unit which can cause fatigue, and minimize time spent on

patient care(11).The study also establishedthat centralized or decentralized nursing workstations influence the efficient operation of nursing units(12).Studies have identified the influence of having decentralized nurses station in reducing walking, increasing time spent on patient care activities and allowing the visibility of patient at all times (13,14&15).

The ward layout could potentially affect how long nurses spent in retrieving requisites for procedures as well as affect how frequently nurses enter patients' rooms. Healthcare managers should consider looking into the spatial qualities of the nurses' assignments and unit layout to maximize work efficiency(16).

2. Physical layout,Qualitypatient care, and staff satisfaction

Our study reveals a strong relationship between the physical setting of the unit and quality patient care. The nurses perceive that the setting is not helpful in planning and organizing nursing care effectively, conducting patient monitoring and providing quality patient care. The study also established that the current setting may lead to adverse patient outcomes and decrease staff satisfaction. A study confirms that effective zoning of supplies and location of resource centres i.e. medications, supplies, linens, and equipment have a positive impact on direct patient care time and documentation (17). Furthermore, this study suggests that more time spent in or near the patient room enhances patient observation and safety which is by our study too.The physical design of inpatient units can obstruct efficient nursing work and diminish patient safetyas identified in our study regarding the relationship between unit design and patient's monitoring and observations (18).

A study found that thevisibility of patient rooms, patient monitoring and observations are compromised as nurses spend the majority of time at the nurse'sstation around the units(19). Researchers have alsoconfirmed that there is a link between the physical layout and patient care outcomes. Furthermore, the study stated that well-designedhospital design can significantly improve patient safety by decreasing healthcare-associated infections and medical errors and has an impact on patient and staff satisfaction (20).

Corridors with longer distances between their rooms had revealed to cause lower visibility of patients (21). A study found that decentralized unit design positively influences proximity topatients andlead to increased patient visits and time spent on nursing care (22). Thehospital structural characteristics like bed size, teaching statusand level of technology are important factors for better patient and organizational outcomes (23). Another study also found that well-designed physical workplaces, attractive environments and smaller units with good visual access to patients can increase patient health and safety and thereby increase staff and patient satisfaction (24). Job-level with heavy workload demands and task-level interruptions involve externally imposed time pressures and mental exertion that negatively influence patient outcomes (25, 26). An association between daily workload per nurse and patient safety incidents and mortalityhas been significantly proven (27).

3. Physical layout, teamwork,and communication

The study establishes that the unit design constraints effective teamwork, multidisciplinary communication and timely response to patient needs.Our study supported by other studieswhich stated that poor physical design may constitute a barrier to teamwork and communication between patient care teams. Furthermore, the study also found that the majority of hospital mishaps result from inadequate communication processes among members of health care teams(28). Another study states that better designing of medical units along with social and technological factors can contribute to more effective healthcare teams (29).

Researchersfound thatineffective or insufficient communication among team members is a significant contributing factor to adverse events. In the acute care setting, communication failures lead to increases in patient harm, length of stay, and resource use, as well as more intense caregiver dissatisfaction and more rapid turnover (30). The researchers established that any breakdown in communication among healthcare workers can lead to impaired situational awareness and patient harm (31).

The physical features of inpatient facilities can obstruct efficient nursing work and diminish patient safety. Poor layout of patient care units and patient rooms and deployment of communication technologies reduce the number of time nurses have available to monitor patient status and provide direct care (32)

V. Conclusion

This study sought to establish the relationship between unit physical setting and its effect on the nurse's workload and the quality of patient care provided. It is evident from the study thatthe unit's physical setting impacts the nurse's workload, quality patient care/ outcomes, teamwork, multidisciplinary communication, and nurses' satisfaction. The study has its limitations as it was only based on the nurse's perception and conducted in one specialty unit in the hospital with a limited sample. Therefore, we recommend further studies to include other units in the hospital with a bigger sample size and other research methodologies.

The study has implications on hospital and nursing leadership and policymakers, as it gives an insight into the effect of appropriate unit physical layout onnurse'sworkload and patient care outcomes. Based on the study, we recommend decreasing the unit bed capacity to a maximum of 30 beds for better unit

management, decentralized nurse's station and resource allocation to reduce nurse's workload and better patient visibility and monitoring.

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