



## Nurse-Patient Ratios and Patient Mortality

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### Abstract

**Background:** In the past several years, there has been a growing need for more registered nurses in hospitals due to rising acuity of patients and shorter lengths of stay. The safety and quality of patient care is directly related to the size and experience of the nursing workforce. Inpatient working conditions have deteriorated in some facilities because hospitals have not kept up with the rising demand for nurses.

**Aim:** The aim of the study is to discuss the impact of Nurse-Patient Ratios as a Patient Safety Strategy in hospitals and other health care organizations on patient care quality, as well as safety-focused outcomes. To determine the association between the nurse to patient ratio and patient mortality at Nablus Hospital and maintaining the appropriate number to the delivery of quality patient care.

**Methodology:** A quantitative design utilizing a survey method (self-administered questionnaire). A sample of (120) nurses who work in governmental and nongovernmental hospital that are broadly distributed in Nablus in West Bank.

**Results and conclusion:** The result show that about half of nurses said the death occurred at the morning. About half of the nurses (49%) said that the event of death they talked about was between Augusts and nowadays, almost similar percentage (48%) said they witnessed less than 5 deaths last year period.

**In conclusion:** Minimum nurse-patient ratios are a necessity for nurses to provide the standard of care that's expected. Improving staffing ratios have been associated with a higher quality of care for hospitalized patients. Moreover, the proportion of nurses with bachelor's education is directly associated with inpatient mortality. Policymakers must implement a legislatively mandated minimum patient-nurse ratio on a shift-by-shift basis to regulate nurse staffing.

**Keywords:** Nurse-Patient Ratio, Quantitative, Mortality Rate, Nablus.

### Introduction

#### Background

Nurses are pivotal in the provision of high quality care in acute hospitals. However, the optimal dosing of the number of nurses caring for patients remains elusive (Falk et al., 2016). In light of this, an updated review of the evidence on the effect of nurse staffing levels on patient an outcome is required (Allen et al., 2016). Nurse staffing is a critical and important health policy issue on which they are the largest body in health care sector. So, Nurses are an important component of the health care delivery system and that nurse staffing has impacts on safety [1]. This emphasize that must be concentrate on research and establish statistic that agree with ratios that protect the public safety.

A nurse-patient ratio can be defined as how many patients one nurse provides care for at one time. The nurse-patient

ratio depends on many factors. One of those factors is the acuity or severity of the patients that the nurse is providing care for e.g. if a nurse works in an ICU the nurse-patient ratio may be 1 nurse to 1 or 2 patients. If a nurse works in another unit like medical unit where the patients are not as sick the nurse-patient ratio may be 1 nurse caring for up to 4 or 5 patients. Many hospital units have criteria that indicate to the amount of patients one nurse can provide caring for at one time [2].

Pressures to improve patient safety within our healthcare system continue to gain momentum as a priority global health policy issue. The nurse patient ratio is a number to describe the number of patients assigned to each nurse [1]. Nurse patient assignments are based on the acuity or needs of the patient for nursing care. In critical care units such as the ICU (intensive care unit) the ratio may be 1:1 for the sickest patients or 1:2 or 1:3 for patients who are acutely ill but stable. On general care units the nurse to patient ratio is

higher for example 1:5 or 1:8 depending on the type of unit and the needs of the patient [3]. This type of nurse patient ratio is based on guidelines from professional organizations and accreditation bodies but is also fluid based on the needs of the individual patients at a given point in time [4].

Adequate nurse staffing benefits patients, staff, and the facility, resulting in the reduction of medical and medication errors, patient mortality, infection and other complications in addition to job dissatisfaction, and staff burnout. A comprehensive practice is designed to restore the health of those who are sick and educate individuals to help maintain or improve health, so nursing care quality has become increasingly important [5]. Moreover, nursing care quality declines with increasing patient numbers. Subsequent studies continued to show a significant relationship between nurse staffing ratios and patient outcomes.

The purpose of this study is explorer that small percentages of hospitalized patients die during or shortly after hospitalization, and the study will discuss the impact of Nurse–Patient Ratios as a Patient Safety Strategy in hospitals and other health care organizations on patient care quality, as well as safety-focused outcomes [6]. Furthermore, to determine the association between the nurse to patient ratio and patient mortality at Nablus Hospital and maintaining the appropriate number to the delivery of quality patient care.

### **Problem Statement**

A small percentage of patients die during hospitalization or shortly thereafter, and it is widely believed that more or better nursing care could prevent some of these deaths. The subject of nurse-patient ratios comes up often in nursing circles. This method allows hospitals to establish staffing levels that are flexible and account for changes including the intensity of patients' needs, the number of admissions, discharges and transfers during a shift, level of experience of nursing staff, layout of the unit, and availability of resources, such as ancillary staff and technology.

This study aimed to know if Palestinian hospital has legally defined required minimum nurse-to-patient ratios to be maintained at all times by unit and determined the impact of Nurse-patient ratios on patient mortality among nursing staff in Nablus city. This study had been performed at Nablus governmental hospitals such as (ALwatani hospital, Rafidia hospital) or private such as (Nablus Specialized Hospital, An-Najah National University NNUH, and Arab Specialized Hospitals).

### **Significance of the Study**

In the past several years, there has been a growing need for more registered nurses in hospitals due to rising acuity of patients and shorter lengths of stay. The safety and quality

of patient care is directly related to the size and experience of the nursing workforce. Inpatient working conditions have deteriorated in some facilities because hospitals have not kept up with the rising demand for nurses. This situation has motivated some hospitals to enact or consider regulatory measures to assure adequate staffing. These regulatory measures assign some minimum level of staffing that all hospitals must meet regardless of the types and severity of patients.

Lack of local study about The Nurse-patient ratios of patient mortality in Palestine and lack of knowledge of The Nurse-patient ratios of patient mortality among nursing staff in Palestine need more attention.

### **Study Purpose and Objectives**

The aim of the study is to discuss the impact of Nurse–Patient Ratios as a Patient Safety Strategy in hospitals and other health care organizations on patient care quality, as well as safety-focused outcomes. To determine the association between the nurse to patient ratio and patient mortality at Nablus Hospital (governmental and nongovernmental) and maintaining the appropriate number to the delivery of quality patient care. To address some of the inconsistencies and limitations in existing studies, design issues and limitations of current methods. To determine the relationship between the Nurse-patient ratios of patient mortality with workload and job satisfaction.

### **Study Objectives**

1. Identifying the appropriate number and mix of nursing staff is critical to the delivery of quality patient care.
2. To asses knowledge among nurse staffing strengthens the health-care system and improves patient safety.
3. To determine the relationship between the Nurse-patient ratios of patient mortality with age, gender and educational level
4. To determine the relationship between the Nurse-patient ratios of patient mortality with workload and job satisfaction

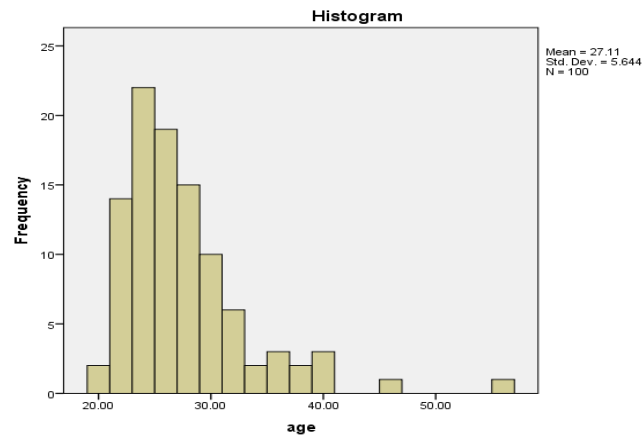
### **Methodology**

A quantitative design utilizing a survey method (self-administered questionnaire). A sample of (120) nurses who work in governmental and nongovernmental hospital that are broadly distributed in Nablus in West Bank.

### **Results and conclusion**

#### **demographic data**

The mean age of the participants is 27.1 YO with a standard deviation of 5.6 years, and the following histogram shows the distribution of age.



The Kolmogorov-Smirnov (K-S) test result is 0.168, which means that the data is normally distributed.

Variable	Value	Number	Percentage
Gender	Male	66	66%
	Female	34	34%
Residence	City	34	34%
	Village	50	50%
	Camp	16	16%
Social status	Single	52	52%
	Married	46	46%
	Widow	2	2%
Workplace	Rafidia Govn. Hospital	17	17%
	Al-Watani Govn. Hospital	19	19%
	An-Najah National University Hospital	21	21%
	Al-Arabi Specialized Hospital	16	16%
	Nablus Specialized Hospital	25	25%
	Other	2	2%
Workplace type	Governmental	37	37%
	Non-governmental	46	46%
	Private hospital	17	17%
Educational level	Diploma	13	13%
	Bachelor degree	77	77%
	High diploma	3	3%
	Master degree	5	5%
	Other	2	2%
Specialty	Nursing	96	96%
	Midwifery	4	4%

Ward	Intensive care unit	46	46%
	Cardiac care unit	37	37%
	Other	17	17%
Staff number at hospital	Up to 100 nurses	20	22.5%
	100 to 200 nurses	33	37.1%
	200 to 300 nurses	34	38.2%
	More than 300 nurses	2	2.2%
Staff number at ward	Up to 10 nurses	6	6.3%
	10 to 20 nurses	64	66.7%
	More than 20 nurses	26	27.1%

**Table 2:** demographic data of the participants and hospitals.

From table 2, about two thirds (66%) of participants are males, half of them are living in villages, and more than half of them (52%) are single. One fourth of the sample works in Nablus Specialized Hospital, with about only third of them (37%) working in a governmental hospital.

More than three fourths of the sample (77%) has bachelor degree, and majority of them are nurses with only 4% are

midwives. Most of the sample works in critical care units, with Intensive Care Unit holding 46% and Cardiac Care Unit holding 37% of the sample. The rest of the sample is distributed in medical, surgical and specialized wards. Of who answered the question, 37.1% of them said their hospital has between 100 and 200 nurses, and 38.2% said it has between 200 and 300 nurses. Also, two-thirds of them said that their ward has between 10 and 20 nurses.

Variable	Value	Number	Percentage
shift in which death occurred	Morning shift	42	42%
	Evening shift	34	34%
	Night shift	19	19%
	Other	5	5%
How long does this shift last?	7 hours	47	47%
	8 hours	40	40%
	10 hours	9	9%
	12 hours	1	1%
	Other	3	3%
Beds number at your ward?	Up to 10 beds	69	69%
	11 to 20 beds	27	27%
	More than 20 beds	4	4%
How much closed beds at your shift?	Zero	22	22%
	1 to 5 beds	62	62%
	More than 5 beds	16	16%
Number of patients at your shift	0 to 10 patients	78	78%
	11 to 20 patients	17	17%
	More than 20 patients	5	5%

Number of nurses at your shift	Less than 3 nurses	21	21%
	3 to 5 nurses	67	67%
	More than 5 nurses	12	12%
Is there a staff depletion in your shift?	Yes	30	30%
	No	61	61%
Did you feel there is a load in that shift?	Yes	51	51%
	No	32	32%
Do you think the number of nurses is enough at that shift?	Yes	51	51%
	No	37	37%
Date of death (month)	Before April	3	3%
	April to July	8	8%
	August till Now	49	49%
Number of deaths happened with you this year	Less than 5 deaths	48	48%
	5 to 10 deaths	17	17%
	More than 10 deaths	14	14%
How many patients were in your ward at the shift?	Less than 5 patients	34	34%
	5 to 10 patients	47	47%
	More than 10 patients	14	14%
Admissions at that shift	Less than 2 admissions	62	62%
	2 to 3 admissions	27	27%
	More than 3 admissions	7	7%
Number of discharges at that shift	Less than 2 discharges	65	65%
	2 to 3 discharges	19	19%
	More than 3 discharges	11	11%
Number of patients you are committed with	Less than 2 patients	14	14%
	2 to 3 patients	46	46%
	More than 3 patients	18	18%

**Table 3:** Information about the shift that the death occurred at.

It is noticed that about half of nurses (42%) said the death occurred at the morning shift, with 47% of them said the shift lasts for 7 hours. While 69% of nurses said their ward has up to 10 beds, 62% of them said that the number of closed beds were 1 to 5 beds. While 78% of nurses said that there was up to 10 patients in their shift, and 67% said there were 3 to 5 nurses at that shift, 61% of nurses said there is no depletion. On the other hand, 51% of nurses said that the number of nurses is enough at the shift.

About half of the nurses (49%) said that the event of death they talked about was between Augusts and nowadays, almost similar percentage (48%) said they witnessed less than 5 deaths last year period. While 47% of nurses said there were 5 to 10 patients in the shift, 62% of them said there were less than 2 admissions and 65% said there were less than 2 discharges at the shift, with about half (48%) of them said they were responsible for 2 to 3 patients.

### Nurses' opinion about nurse-patient ratio in their ward

From table 3, 53% of patients claim they have enough time to be with their patients, and approximate percentage (57%) said that there was enough number of nurses at the shift. While about half of the nurses said there were other actual employees at the shift, about two thirds.

### In conclusion

The result show that about half of nurses said the death occurred at the morning. About half of the nurses (49%) said that the event of death they talked about was between Augusts and nowadays, almost similar percentage (48%) said they witnessed less than 5 deaths last year period.

Minimum nurse-patient ratios are a necessity for nurses to provide the standard of care that's expected. Improving staffing ratios have been associated with a higher quality of care for hospitalized patients.

(67%) of them said they have enough skills to treat with their patients. Less than third of nurses (30%) said their ward has basic nurse-patient ratio, more than half of them said it was 1:1 ration. On the other hand, 52% of nurses said that their institution has a protocol to deal with the nursing depletion; less percentage of 44% said it was applied at their shift.

While 81% of nurses said there should be a global nurse-patient ratio, about third of them (33%) said it should be 1:3, and more than half (58%) said other options (1:2 and 1:1 were selected by 22% and 36% of nurses respectively). Lastly, most of nurses (71%) said it is positive to have this ratio.

So that the higher staffing ratios have resulted in a measurable impact on patient outcomes. This was congruent with ANA (2018) emphasized that "Each state must stipulate in law and regulations a required minimum nurse-to-patient ratio to be maintained at all times by unit as California which was the only state that stipulates in law

and regulations" [7]. Policymakers must implement a legislatively mandated minimum patient-nurse ratio on a shift-by-shift basis to regulate nurse staffing.

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