

**Factors Affecting Prediction of Pressure
Ulcer among Patients at Critical Care
Unit: Suggested Nursing
Care Plan**

Thesis

*Submitted for Partial Fulfillment of the Requirement of
Master Degree in Medical Surgical Nursing
(Critical Care Nursing)*

By

Lobna Abdel all Ibrahime

Bachelor of Nursing (2012)

Faculty of Nursing-Sohag University

**Faculty of Nursing
Ain Shams University
2019**

**Factors Affecting Prediction of Pressure
Ulcer among Patients at Critical Care
Unit: Suggested Nursing
Care Plan**

Thesis

*Submitted for Partial Fulfillment of the Requirement of
Master Degree in Medical Surgical Nursing
(Critical Care Nursing)*

Supervised By

Ass. Prof. Neamatalah Goma Ahmed

**Assistant Professor of Medical Surgical Nursing
Faculty of Nursing – Ain Shams University**

Ass. Prof. Dalia Ali Ameen

**Assistant Professor of Critical Care Nursing
Faculty of Nursing – Ain Shams University**

**Faculty of Nursing
Ain Shams University**

2019

Factors Affecting Prediction of Pressure Ulcer among Patients at Critical Care Unite: Suggested Nursing Care Plan

^a Lobna A. Ibrahim, ^b Neamatalah Goma Ahmed and Dalia Ali Ameen.

^a Clinical instructor /Faculty of Nursing Sohag University, ^b Ass. Professor /Medical Surgical Nursing Department/Ain Shams University.

Abstract

Background: Pressure ulcer is described as one of the most costly and physically debilitating complications. **Aim:** This study aimed to assess factors affecting prediction of pressure ulcer among patients at critical care unites. **Design** A descriptive exploratory design was utilized for the conduction of this study. **Setting** the study was carried out in critical care unit (ICU) of Sohag University Hospital. **Study subject:** A purposeful sample of seventy patients. **Tools:** **I** – patient assessment form which includes patients demographic characteristics' and patients' clinical data, **II-** Braden scale to detect high risk patient for pressure ulcer, **III-**factors affecting prediction of pressure ulcer tool. **Results:** revealed that, many factors affecting prediction of pressure ulcers, such as patient's related factors, 55.7% of the studied patients were bed ridden, 87.1% of them were incontinence of stool, 72.9% having a low level of consciousness, 74.3% of the studied patients exposed to shear and friction on the skin, 64.3% were diabetic, and 55.7% were suffered from vascular disease. Almost all of the nurses' practices regarding pressure ulcer prevention were poor, and according to Braden scale assessment 55.7% of patients admitted to ICU were at high risk for pressure ulcer. **Conclusion:** more than half of patients admitted to ICU had sever risk for pressure ulcer according to Braden scale, more than half of patients were bed ridden, most of them were incontinence of stool, three quarter of patients having a low level of consciousness and were exposed to shear and friction on the skin, nearly two third of patients were diabetic and more than half of them were suffered from vascular disease. All of nurses' practices regarding pressure ulcer prevention were poor, and most of patients did not have environmental factors to prevent pressure ulcer. **Recommendations:** Application of Braden scale tool to assess all admitted patients to intensive care units. Braden scale should become as daily nursing assessment task.

Keywords: Pressure ulcer – Braden scale – Nursing.



Acknowledgement

First and foremost, I feel always indebted to **ALLAH**, the most kind and most the merciful for all his blessing and for giving me the will and strength for completion of this work.

I am deeply grateful to **Ass. Prof. Nematalah Goma Ahmed**, Ass. Prof. of Medical Surgical Nursing, Faculty of Nursing, Ain Shams University, for her guidance, constructive criticism and supervision for the perfection of this thesis.

I would like to express my deep thanking and appreciation to **Ass. Prof. Dalia Ali Ameen**, Ass. Prof. of critical care Nursing, Faculty of Nursing, Ain Shams University, for her unlimited help, effort, support, guidance and for the time she devoted to me in this work. I would not have been able to start and continue this work without her help.

I would like to express my deep thanking for patients who accept to participate in this thesis.

Lobna Abdel all Ibrahim

List of Contents

<i>Title Page</i>	<i>Page No.</i>
List of Tables	i
List of Figures	ii
List of Appendices	iii
List of Abbreviations	iv
Introduction.....	1
Aim of the Study	7
Review of Literature	8
Subjects and Methods	77
Results.....	93
Discussion	119
Conclusion	143
Recommendation	144
Summary	146
References.....	161
Appendices.....	183
Protocol	
Arabic Summary	

List of Tables

Table No	Title	Page No
1	Frequency and Percentage distribution of demographic characteristics of the studied patients.	95
2	Frequency and Percentage distribution of clinical data of the studied patients.	96
3	Mean and stander deviation of anthropometric measurement of the studied patients.	97
4	Frequency and Percentage distribution of hemodynamic parameters of the studied patients.	98
5	Frequency and Percentage distribution of the skin condition of the studied patients.	100
6	Frequency and Percentage distribution of neurological assessment of the studied patients by using Glasgow coma scale.	101
7	Frequency and Percentage distribution of laboratory investigation and blood gases measurement of the studied patients.	103
8	Frequency and Percentage distribution of respiratory aids of the studied patients.	105

Table No	Title	Page No
9	Frequency and Percentage distribution of the studied patients according to Braden scale score.	106
10	Frequency and percentage distribution of patients related factors.	108
11	Frequency and percentage distribution of nurses related factors.	109
12	Frequency and percentage distribution of environment related factors.	110
13	Relation between demographic characteristic of the studied patients and total score of Braden scale regarding prediction of pressure sore risk.	111
14	Relation between clinical data of the studied patients and total score of Braden scale regarding prediction of pressure sore risk.	112
15	Relation between anthropometric measurement of the studied patients and total score of Braden scale regarding prediction of pressure sore risk.	113
16	Relation between hemodynamic parameters of studied patients and total score of Braden scale regarding prediction of pressure sore risk.	114

Table No	Title	Page No
17	Relation between respiratory aids of the studied patients and total score of Braden scale regarding prediction of pressure sore risk.	116
18	Relation between skin condition of the studied patients and total score of Braden scale regarding prediction of pressure sore risk.	117
19	Relation between neurological assessment of studied patients using Glasgow coma scale and total score of Braden scale regarding prediction of pressure sore risk.	118

List of Figures

Review of Literature		
Fig.	Title	Page
1	Anatomy of the skin.	9
2	Stage of pressure ulcer	25-29
3	Causative factors for pressure ulcer	30
List of figures of tool validity and reliability		
	Job title of the expertise regarding face and content validity of the study tools	205

List of Appendices

Appendix N	Title of appendix	Page
Appendix (I)	Patient assessment tool	183
Appendix (II)	Braden scale	190
Appendix (III)	Factors affecting prediction of pressure ulcer tool	195
Appendix (IV)	Suggested nursing care plan.	198
Appendix (V)	Hemodynamic parameter	202
Appendix (VI)	Tools validity and reliability.	205

List of Abbreviations

<i>Abb.</i>	<i>Full Term.</i>
ALB	: Albumin
ABG	: Arterial Blood Gases
BS	: Bed sore
BP	: Blood pressure
BMI	: Body mass index
B/M	: Breath per minute
CO₂	: Carbon dioxide
Cm	: Centimeter
CAN	: Certified nursing assistant
C/M	: Cycle per minute
DTPI	: Deep tissue pressure injury
DU	: Decubitus ulcers
DNA	: Deoxyribonucleic Acid.
DM	: Diabetes mellitus
DKA	: Diabetic ketoacidosis
EPUAP	: European pressure ulcer advisory panel
GCS	: Glasgow coma scale
Glu	: Blood glucose
g	: Gram
Hgb	: Hemoglobin
HCT	: Hematocrit
HCO₃	: Sodium bicarbonate

IGE	: Immunoglobulin E
ICU	: Intensive care unit
IAD	: Incontinence- associated dermatitis
Kg	: Kilo gram
LOC	: Level of conscious
LOS	: Length of stay
m	: Meter
mm	: Millimeters
mmHg	: Millimeters of mercury
mg/dl	: Milligrams per deciliter
MV	: Mechanical ventilation
NG	: Nasogastric
NPUP	: National pressure ulcer advisory panel
NPWT	: Negative pressure wound therapy
NSAID	: Non-steroidal anti-inflammatory
NPO	: Nothing per mouth
O₂	: Oxygen
Paco₂	: Partial pressure of carbon dioxide
Pao₂	: Partial pressure of oxygen
PH	: Power of hydrogen
PI	: Pressure injury
PU	: Pressure ulcer
PS	: Pressure sores
PT	: Prothrombin time
RBC	: Red blood cell

TMP : Temperature
WBC : White blood cell

Statistical abbreviation

NO : Number
NS : Not Significant
P : P- Value
S : Significant
SD : Standard Deviation
SPSS : Statistical Package For Social Science

Introduction

Pressure ulcer (PU) commonly called Pressure injury (PI), pressure sores (PS), decubitus ulcers (DU) or bedsores (BS), are localized injury occur most often in the skin and subcutaneous tissue over bony prominences. This ulcer may be superficial, caused by local skin irritation and redness with subsequent surface maceration, or deep, originating in underlying tissue. Deep lesions often go undetected until they penetrate the skin, and usually caused subcutaneous damage. Most pressure ulcer develops over body locations: sacral area, greater trochanter, ischia tuberosity, heel, and lateral malleolus. Collectively, these areas account for 95% of all pressure ulcer sites (*Ferris, 2017*).

Pressure for long period of time decrease blood supply and ischemia occur, redness can occur at the site within one hour, when pressure continue for more than 1 hour, necrosis (tissue death) occur. Pressure ulcer usually occurs over a bony prominence because they are covered only by skin and small amounts of subcutaneous tissue, such as the occipital skull, pinna of ears, sacrum, ischia tuberosities, and trochanter area of hips, ankle's, elbow, and heels are

the area's most likely to develop a pressure ulcer (*Linton, 2015*).

National Pressure Ulcer Advisory Panel (NPUAP) modified the staging systems of developing pressure ulcer into six stages. **Stage I** non-blanchable erythema with intact skin surface; **Stage II** epithelial damage, abrasion or blister; **Stage III** damage to the full thickness of the skin without a deep cavity and **Stage IV** damage to the full thickness of the skin with a deep cavity. **Unstageable Pressure ulcer:** Obscured full-thickness skin and tissue loss, full-thickness skin and tissue loss in which the extent of tissue damage within the ulcer cannot be confirmed because it is obscured by slough or eschar. **Deep Tissue Pressure ulcer:** Persistent non-blanchable deep red, maroon or purple discoloration intact or non-intact skin with localized area or epidermal separation revealing a dark wound bed or blood filled blister (*Cash & Glass, 2017*).

Researchers reported that the incidence and prevalence of pressure ulcers vary greatly, depending on the setting. In the hospital, incidence rates have ranged from 1% to 30%. Higher rates are noted in intensive care units, where patients are less mobile and have severe systemic illnesses (*Banjar, Mahran & Ali 2012*). The incidence of pressure