Nursing Practices for patients at risk to the pressure sores in Minia University Hospital

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Abstract: Aim of this study: Describe management practices for identifying patients at risk to the pressure sores in Minia University Hospital, assess level of nursing staff performance towards pressure ulcers (PU) prevention practices and investigate the relationship among management practices, and occurrence of pressure sores. A Prospective descriptive study design was carried out in the present study. This study was carried out at Minia University Hospitals in the following units (ICU, and Stroke). The study sample included 30 patients in critical care unite and 15 patients in stroke unit completed within the first 24 hours of admission and each 48 hours thereafter for a maximum of 12 weeks. (2010) in the selected units at Minia University Hospitals with total number (n=45). **Tools of the study:** it was classified into three parts as follows: **1st** part related to socio-demographic characteristics of the study sample (age, unit, sex status, and nursing staff education). **2nd** part to assess patient's physical status consisted of five variables and pressure sores assessment consisted of eight variables. **3rd** part observational checklist consisted of fifty one variables six related to pressure sores prevention domains which were patient's position in bed consisted of twelve variables, patient's position in wheelchair consisted of five variables, patient's skin care consisted of thirteen , use of bed sheet consisted of four variables, use of supportive device consisted of six variables , and observe sites of pressure sore consisted of eleven variables; The scoring system of this tool was done scored (1), and not done scored (2). **Results:** it were found that the Mean of the study was 44.51. Regarding to sex it was found that the highest percentages of the study samples were male (60.4%). It presented that nurses performance were used bed sheets and observe signs and symptoms of sores sites for most of patients as pressure ulcer prevention (constituted 100% & 62.5 %). **Recommendations: In the light of the present findings the researchers recommended that**: Pressure ulcer prevention should be a priority for nurses in critical care settings for patient at risk to reduce complication. In-service training educational program for nursing staff about evidence based practices that limit prevalence of pressure ulcer .Eeducate the caregiver and patient's family about update risk assessment ,prevention measures and treatment of pressure ulcers. Education regarding preventive care can be effective in reducing the incidence of PUs in the ICU setting.

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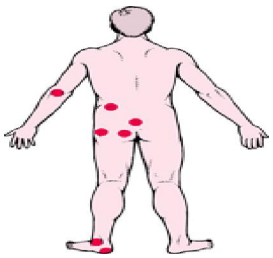
1. Introduction

Bedsores, more accurately called pressure sores or pressure ulcers, are areas of skin damage and tissue that develop when sustained pressure cuts off circulation due to pressure resulting from a lack of blood flow to any part of the body, especially portions over bony or cartilaginous areas such as sacrum, elbows, knees, ankles etc.without adequate blood flow, the affected tissue dies.



Berlowitz (2009) Pressure ulcers are one indicator of quality of care, which is required for participation in Medicare and Medicaid. ***Baltimore (1995) & Black et al., (2007)*** Bedsores Although easily prevented and completely treatable if found early, bedsores are often fatal even under the auspices of medical care and are one of the leading iatrogenic causes of death reported in developed countries, second only to adverse drug reactions ***Elliott (2009)***.

Epidemiology of pressure sores: within acute care, the incidence of bedsores is 0.4% to 38%; within long-term care, 2.2% to 23.9%; and in home care, 0% to 17%. There is the same wide variation in prevalence: 10% to 18% in acute care, 2.3% to 28% in long-term care, and 0% to 29% in home care. There is a much higher rate of bedsores in intensive care units because of immunocompromised individuals, with 8%

to 40% of ICU patients developing bedsores ***PMID (2001)***.

Theories about the development of pressure ulcers: There are currently two major theories about the development of pressure ulcers. The first theory and most accepted is the deep tissue injury theory which claims that the ulcers begin at the deepest level, around the bone, and move outward until they reach the epidermis. The secondtheory, less popular theory is the top-to-bottom model which says that skin first begins to det- -eriorate at the surface and then precedes inward ***Niezgoda (2006)***. Pressure ulcers or decubitus ulcers, are accepted to be caused by three different tissue forces: **a) Pressure** or the compression of tissues. In most cases, is caused by the force of bone against a surface, as when a patient remains in a single decubitus position for a lengthy period, decreased tissue perfusion, ischemia occurs and can lead to tissue necrosis if left untreated in an immunocompromised patient. **b) Shear force**, or a force created when the skin of a patient stays in one place as the deep fascia and skeletal muscle slide down with gravity. This can also cause the pinching off of blood vessels which may lead to ischemia and tissue necrosis. **c) Force** resisting the shearing of skin**,** or a Friction. This may cause excess shedding through layers of epidermis. Other factors in the development aggravating the situation of bedsores include age, unrelieved pressure; friction nutrition, vascular disease, diabetes mellitus, and smoking . Excess moisture from incontinence, perspiration or exudates that may cause the bonds between epithelial cells to weaken thus resulting in the maceration of the epidermis and medication ***Mayoclinic.com.(2011)***.

There are factors that increase risk for pressure ulcers such as: Being bedridden or in a wheelchair, fragile skin, having a chronic condition, such as diabetes or vascular disease, that prevents areas of the body from receiving proper blood flow, inability to move certain parts of your body without assistance, such as after spinal or brain injury or if you have a neuromuscular disease (like multiple sclerosis), malnourishment, mental disability from conditions such as Alzheimer's disease in which the patient may not be able to properly prevent or treat pressure ulcers ,Older age and Urinary incontinence or bowel incontinence ***Garcia , (2006)***.

The risk of developing bedsores can be determined by using the Braden Scale for Predicting Pressure Ulcer Risk. This scale is divided into six risk categories: 1) sensory perception, 2) moisture, 3) activity, 4) mobility, 5) nutrition, and 6) friction and shear .The best possible interpretation is a score of 23 whilst the worst is a 6. If the total score is below 11, the patient is at risk for developing bedsores ***Braden (1997)***.

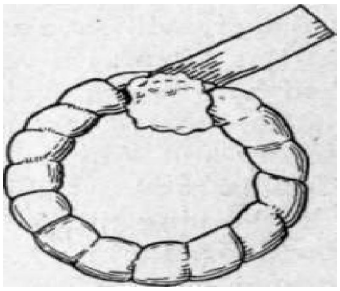
Symptoms of pressure sores:

Merck (2011) and Dealey (2009) mentioned that bedsores fall into one of four stages based on their severity. Pressure Ulcer has defined each stage as follows**. Stage I** is the most superficial, indicated by non blanchable redness that does not subside after pressure is relieved. This stage is visually similar to reactive hyperemia seen in skin after prolonged application of pressure. **Stage II** is damage to the epidermis extending into, but no deeper than, the dermis. In this stage, the ulcer may be referred to as a blister or abrasion. **Stage III** involves the full thickness of the skin and may extend into the subcutaneous tissue layer. This layer has a relatively poor blood supply and can be difficult to heal. At this stage, there may be undermining damage that makes the wound much larger than it may seem on the surface. **Stage IV** is the deepest, extending into the muscle, tendon or even bone. Unstageable pressure ulcers are covered with dead cells, or eschar and wound exudate, so the depth cannot be determined. Healing time is prolonged. While about 75% of Stage II ulcers heal within eight weeks, only 62% of Stage IV pressure ulcers ever heal, and only 52% heal within one year ***Thomas , et al.. (2005)***.

The tests and diagnosis of pressure sores is to evaluate the size and depth of the pressure sores, Check for bleeding, fluids or debris in the wound, and assess the area around the wound for signs of spreading tissue damage or infection. The tests which can be done as blood tests to assess your nutritional status and overall health, Tissue cultures to diagnose a bacterial or fungal infection in a wound that doesn't heal with treatment or is already a stage IV wound, and Tissue cultures to check for cancerous tissue if it's a chronic, non healing wound**.** ***Mayoclinic.com. (2011)***

Bluestinet al., (2008) said that prior to the 1950s; treatment was ineffective until showed that the primary cure and treatment was to remove the pressure by turning the patient every two hours. The stage I and stage II pressure sores usually heal within several weeks to months with conservative care of the wound that manages risk factors for pressure sores. Stage III and IV pressure sores are more difficult to treat.

The Strategies to reduce pressure include the following: Relieving pressure, Repositioning, Support surfaces. Special cushions, pads, mattresses and beds, removing damaged tissue are accomplished with a number of methods depending on the severity of the wound such as Cleaning and dressing wounds ***Elliott (2009)***.



Other Treatment interventions that may be used are**:** Pain management, Antibiotics, Healthy diet. Muscle spasm relief. Muscle relaxants and Surgical repair for pressure sores that fail to heal ***Berlowitz (2011) and Guy (2004)***.

Bedsores are easier to prevent than to treat, but that doesn't mean the process is easy or uncomplicated. And wounds may still develop with consistent, appropriate preventive care prevention requires Identification of high-risk patients, Repositioning Contentious skin care and hygiene, Avoidance of oversedation ***Fonder et al.,(2008)***.

Strategy of pressure sores that can help decrease the risk of pressures sores include the following :Position changes ,repositioning in a wheelchair, repositioning in a bed ,Skin care, Managing incontinence, nutrition and Other strategies as Quit smoking and Stay active ***Mayoclinic.com (2011)***.

Aims of this study are:

1- Describe strategies management practices for identifying patients at risk to the pressure sores in Minia University Hospital.
2- Assess a level of nursing staff performance towards pressure sores prevention practices.
3- Investigate the relationship among management practices, and occurrence of pressure sores.

2. Subjects and Methods:

Study design:

A Prospective descriptive study design was carried out in the present study.

I-Setting:

This study was carried out at Minia University Hospitals in the following units (Critical care unit and Stroke unit).

II-Subjects:

The study sample comprised 45 patients admitted to critical care units (n=30) and stroke unit (n=15) from May to July 2010 at Minia University Hospital.

III- Tools of the study:

The tools are classified into three parts as the following:

1st part related to socio-demographic characteristics of the study sample (age, unit, sex status, and nursing staff education).

2nd part to assess patient's physical status consisted of five variables and hospital measures to assess pressure sores items consisted of eight variables, it was developed by researcher.

3rd part observational checklist related to pressure sores prevention domains which include 6 components consisted of fifty one variables which were patient's position in bed consisted of twelve variables, patient's position in wheelchair consisted of five variables, patient's skin care consisted of thirteen, use of bed sheet consisted of four variables, use of supportive device consisted of six variables , and observe sites of pressure sore consisted of eleven variables It was developed by researcher were reviewed with literature reviews**.**

IV. Administrative design

An official permission was obtained from the hospital director, the nursing service director and head of each unit.

V. Operational design

This design explains the steps of actual implementation of the study, including the pilot and the field work.

Pilot study:

A pilot study was conducted to test both the feasibility and practicability of the study tools, and detect the obstacles and problems that may be encountered during data collection. It was carried out on 10 patients from both inpatient units at hospital settings. Data collected from the pilot study were reviewed and used in making the necessary modifications prior to the final application of the study tools.

Field work:

After making the necessary modifications to ensure the clarity of the study tools, the actual data collection from studied patients at Minia University Hospitals was completed within the first 24 hours of admission and each 48 hours thereafter for a maximum of 12 weeks. Was started from May to July (2010) by observational checklist at the aforementioned unit in morning and afternoon shift.

VI. Statistical design

Upon completion of data collection, data entry was done using Epi-Info 6.04 computer software package, while statistical analysis was done using SPSS 11.0 statistical software packages. Data were presented using descriptive statistics in the form of frequencies and percentages for qualitative variables,

and means and standard deviations for quantitative variables.

3. Results:

Table (1): shows the sociodemographic characteristics of the study regarding to the age it were found that the Mean of the study was 44.51. Regarding to sex it was found that the highest percentages of the study samples were male (60.4%). Regarding to the department it was found that the majorities of the study samples were (62.5%) present in critical care unit.

Table (2): Shows the Physical and Clinical characteristics of the study regarding to the level of Conscious it was found that the majorities of study sample was in coma (33.3%). Regarding to the level of activity it was found that the highest percentage were immobile (75.0%). Regarding to the nutritional and status it was found that the majority of the study samples were (77.1%). Regarding to the elimination status it was found that the majority of the study samples were incontinence (70.8%)

Table (3): shows distribution percent in relation to care providing for prevention pressure sores the result revealed that (79.2%) of the study sample was perform passive range of motion. Regarding to the perform of daily skin assessment the result revealed that (64.6%) were done skin assessment. Regarding to the perform of daily skin care (bathing) the result revealed that (45.8%) perform complete bed bath. Regarding to the use of specific bed mattress the result revealed that (14.6%) were use specific bed mattress. Regarding to the type of pressure sores degree the result revealed that (10.4%) had first degree pressure sores while (81.3%) had not pressure sores. Regarding to the provider for pressure sores care the result revealed that (62.5%) were nurses.

Table (4): Shows distribution of nurses performance towards pressure ulcer prevention. It presented that nurses performance were used bed sheets and observe signs and symptoms of sores sites for most of patients as pressure ulcer prevention (constituted 100% & 62.5 %)while pressure ulcer prevention domains that was not used as patient's position in bed or wheelchair(constituted 100%).

Table (5): illustrated relationship between pressure sores prevention domains and level of conscious of study group. It stated that a statistical significant relation between patients' level of conscious and using of patient position in bed, care of skin using of bed sheets and using of supportive devices.

Table (1): Socio-demographic Characteristics of Study Sample(N=45)

Socio-demographic Characteristics N = (59)	No.	%
Age :		
• 18-30Years	0	0
• 31-40Years	6	12.5
• 41-50 Years	34	70.8
• 51-65 Years	5	10.4
Mean	44.51	
Sex :		
• Males	29	60.4
• Females	16	39.6
Department:		
• Critical Care Unit	30	62.5
• Neurology Department	15	37.5

Table (2): Physical and Clinical Characteristics of Study Sample(N=45)

Physical and Clinical Characteristics N = (59)	No.	%
Level of Conscious:		
• Oriented	9	18.8
• Disoriented	1	2.1
• Confused	5	10.4
• Semi-coma	14	29.2
• Coma	16	33.3
Level of activity		
• Mobile with assistance	9	18.8
• Immobile	36	75.0
Nutritional & fluid status		
• Normal	37	77.1
• Dehydrated	2	4.2
• Malnutrition	3	6.3
• Loss of weight	3	6.3
Elimination status		
• Incontinence	34	70.8
• Normal	11	22.9
Comfort status		
• Comfort	36	75.0
• Discomfort	9	18.8

Table (3): Distribution of Study Sample according to hospital measures for pressure sores prevention. ***(N=45)***

Hospital measures for pressure sores prevention.	**No.**	**%**
Perform of daily range of motion		
Passive	38	79.2
Active passive	7	14.6
Perform of daily skin assessment		
No	14	29.2
Yes	31	64.6
Perform of daily skin care (bathing)		
Complete	22	45.8
Partially	13	27.1
Not. Done	10	20,8
Use of specific bed mattress		
No	38	79.2
Yes	7	14.6
Documentation for pressure sores occurrence		
Document	31	64.6
Not document	14	29.2
Assess of pressure sores degree		
Non	39	81.3
Frist degree	5	10.4
Second degree	1	2.1
Pressure prevention facilities		
Not presence	15	31.3
Not complete	30	62.5
Care provider		
Nurse	30	62.5
Relative of patient	15	37.5

Table (4): Distribution of nurses performance for pressure ulcer prevention domains

Pressure sores prevention domains	**Poor**		**Fair**		**good**	
	No.	%	No.	%	No.	%
D1-Patient's position in bed	45	100	0	0	0	0
D2-Patient position in wheelchair	45	100	0	0	0	0
D3-Care of skin	17	35.4	28	58.3	0	0
D4-Using of bed sheets	15	31.3	0	0	30	62.5
D5-using of supportive devices	30	62.5	15	31.3	0	0
D6-Observe signs and symptoms of sores sites	0	0	0	0	45	100

Table (5): Relationship between pressure sores prevention domains and level of conscious of study group (n=45)

pressure sores prevention domains	Oriented	Disoriented	Confused	Semi-coma	Coma		
	Mean and Standard Deviation					**F**	**P**
D1-Patient position in bed	.77 .44	.000	.80 .44	.64 .49	.62 .50	.73	**.57**
D2-Patient position in wheelchair	1.00 .00	1.00	1.00	1.00 .00	1.00 .00	-	-
D3-Care of skin	5.66 2.64	1.00	5.80 2.98	4.85 2.98	4.42 3.08	.81	**.52**
D4-Using of bed sheets	1.77 .44	1.00	1.80 .44	1.64 .49	1.62 .50	.73	**.57**
D5-using of supportive devices	.44 .88	2.00	40.00 .89	71.00 .99	.75 1.00	.73	**.57**
D6-Observe signs and symptoms of sores sites	11.00 .00	11.00 .00	11.00 .00	11.00 .00	11.00 .00	-	-

4. Discussion:

Socio-demographic Characteristics of Study Sample:

In this study, we recruited a sample which represented different sexes, ages, grades and anatomical positions of pressure ulcers, and reasons for admission (including chronic and acute conditions).

Although the age range of our sample was quite broad (18–65 years) and the mean age was (44.51), the most of the patients were aged 34-50.

Other studies findings disagree with current results ***Spilsbury et al., (2007)*** and ***(Barbenel et al., 2007)*** who revealed that 70% of the patients were aged over 70, the majority of them had been admitted to hospital for reasons other than a pressure ulcer.

Also, ***Allman et al., (2005)*** revealed that the second strongest risk factor was patient age. After adjustment for other predictors, patients who were 70 years of age or older still had a 5-fold increase in the risk for development of a pressure ulcer, compared with young adults.

In the present study most of the patients were male. On the contrary, ***Perneger (2008)*** stated that males and females were equally represented in the sample, but pressure ulcer incidence was higher in females than in males.

Regarding to the department it was found that the majorities of the study samples were present in critical care unit. These result correlated with ***Perneger (2008) and Reddy et al., (2006)*** who concluded that most patients were hospitalized in the following various clinics: internal medicine, abdominal surgery, orthopedic surgery, neurology, ophthalmology, intensive care, ear-nose-throat, gynecology, and dermatology, rehabilitation and semi–acute care wards.

Physical and Clinical Characteristics of Study Sample(N=45)

In the present study, the results indicated that about third of the study group was in coma. This confirmed by ***Berman et al., (2010)*** who stated that when a patient or resident is confused, very sleepy, or in a coma, they may not turn like other alert patients normally do even when they are sleeping. People that do not have a normal sense of pain and the physical ability to turn will remain in one position for a very long time unless someone else turns them. If a patient stays in one position for a long time, they will get a pressure ulcer.

Regarding to the level of activity it was found that the highest percentage of the study subjects were immobile. In the same line with ***Nettina (2009)*** who discuss about lack of mobility that pressure ulcers occur when people are not up and walking. They form when a person stays in the bed, chair or wheelchair for a long time. Blood is cut off to areas where bones are close to the skin when a person stays in a chair or in bed for a long time. The weight of the body pushes against a bony area to cut off the blood and oxygen to that area. The sacrum, elbows, ears, shoulders, toes and heels are some of these bony areas that can break down when a person is kept in one position for a long period of time.

Furthermore, this study revealed that the majority of the study subjects were normal ***nutritional and fluid status.*** This not agreed with ***Berman et al., (2010)*** who proved that patients and residents with a poor diet are at risk for pressure ulcers. The skin and other tissue, as well as the rest of the body, does not get the food and nutrition it needs to be healthy and without injury if the diet is not good. Patients who do not eat or drink do not get a good diet unless something like a tube feeding is used.

Generally, An individual's potential to develop pressure ulcers may be influenced by the following intrinsic risk factors which therefore should be considered when performing a risk assessment: reduced mobility or immobility; sensory impairment; acute illness; level of consciousness; extremes of age; vascular disease; severe chronic or terminal illness; previous history of pressure damage; malnutrition and dehydration ***Stordeur et al., (2008)***.

In this study, it was found that the majority of the study samples were incontinence. This confirmed with what was reported by ***Nettina (2009)*** that residents and patients who are wet are at risk for pressure ulcers. Patients that are incontinent of urine or stool, those that sweat a lot and those that have draining wounds are at risk for pressure ulcers. Moisture makes the skin soft that leads to skin breaks.

Distribution of Study Sample according to hospital measures for pressure sores prevention. *(N=45)*

The result of the present study revealed that the majority of the study sample was perform passive range of motion. Which agreed with ***Defloor (2007) and Colin et al, (2006)*** who stated that individuals who are 'at risk' of pressure ulcer development should be repositioned. The frequency of repositioning should be determined by the results of skin inspection and individual needs not by a ritualistic schedule. Regarding to the performance of daily skin assessment this result revealed that more than half of the study sample was done skin assessment. Also, ***Bennett (2005)*** proved that skin inspection provides essential information for both assessment and prevention. Although the precise role that skin inspection plays in decreasing the incidence of pressure ulcers has not been determined, regular assessment of the most vulnerable parts of the body

will enable early detection of incipient pressure damage.

Additionally, regarding to the performance of daily skin care (bathing) the result revealed that than less than half of the study sample perform complete bed bath. And ***Torra et al., (2005)*** reported that dry sacral skin is known to be a risk factor for developing pressure ulcers. Moisturizing skin is inexpensive and unlikely to be of harm, so it would be a reasonable strategy to implement to prevent pressure ulcers.

Regarding to the use of specific bed mattress the result of this study revealed that (14.6%) were use specific bed mattress. This result agreed with ***McGough (2009)***
Who reported that, Decisions about which pressure redistributing device to use should be based on an overall assessment of the individual and not solely on the basis of scores from risk assessment scales.

The study results on the contrary with findings of ***Hampton (2007)*** who reported that specialized support surfaces (such as mattresses, beds, and cushions) reduce or relieve the pressure that the patient's body weight exerts on skin and subcutaneous tissues as it presses against the surface of a bed or chair. If a patient's mobility is compromised and this interface pressure is not relieved, the pressure can lead to impaired circulation and ulcer formation.
Also, this study revealed that the majority of the study subjects had not pressure sores degree this may be related to short length of hospital stay for study group this results disagree with **Leman et.al (2009)** who reported that pressure ulcers developed in 5 patients (16.7%); all PUs were located on the heel. Moreover the Canadian Association of wound care funded a study to determine the extent of pressure ulcers in Canada and discovered that the mean prevalence rate was 26% and recognizing this as a significant health-related problem **Heather et.al (2009)**,

In additional to the provider for pressure sores care revealed that (62.5%) were nurses this results due to hospital policy not allow for presence of any family member accompanied with patient in critical care settings .

Distribution of nurses performance for pressure ulcer prevention domains it presented that nurses performance were used bed sheets and observe signs and symptoms of sores sites for most of patients as pressure ulcer prevention while pressure ulcer prevention domains that was not used as patient's position in bed or wheelchair. This finding may be less of hospital facilities and lack of nurses knowledge and practices about other measures for pressure ulcer prevention.

4.Conclusion:

It were found that the mean of the study age group was 44.51. Regarding to sex it was found that the highest percentages of the study samples were male (60.4%). It presented that nurses performance were used bed sheets and observe signs and symptoms of sores sites for most of patients as pressure ulcer prevention (constituted 100% & 62.5 %).

Recommendations:
In the light of the present findings the researchers recommended that:

1. Pressure ulcer prevention should be a priority for nurses in critical care settings for patient at risk to reduce complication.
2. In-service training educational program for nursing staff about evidence based practices that limit prevalence of pressure ulcer .
3. Educate the caregiver and patient's family about update risk assessment ,prevention measures and treatment of pressure ulcers.
4. Teaching regarding preventive care can be effective in reducing the incidence of PUs in the ICU setting.
5. Encourage nurses to participate in pressure ulcer awareness and prevention program for quality improvement in health care settings .

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