

Factors Related to Decubitus in Patient with Bed Rest and Physical Immobilization : A Systematic Review

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Abstract: Background: Decubitus is one of nosocomial infection that caused by a very long bedrest and physical immobilization. The prevalence of decubitus was still high in Indonesia. The objective of this systematic review was to identify factors that cause decubitus in patient with bedrest and physical immobilization. Method: 15 best articles were found using PECOT framework in some databases; EBSCO, Science Direct, Scopus, ProQuest, Pub Med, Wiley and Springer Link. Those articles have been chosen based on some criteria. Result: These are factors that cause decubitus ; Medical diagnosis, nutritional deficit, using mechanical ventilator, skin integrity, age, gender, immobilization, skin type, nurse's workload, Length of Stay (LOS), fecal incontinence, environment humidity, albumin, hemoglobin, limfosit, triceps skinfold, blood pressure, sensory perception, friction, weight, mental status, vertebra trauma, diabetic history, and hypertension. Discussion: The most dominant factor was immobilization, skin integrity, friction, nutrition, age, and gender.

1 BACKGROUND

Decubitus is a common problem most common in patients with prolonged bed rest or physical limitations. The problem lies with all health facilities, including hospitals, clinics, home care facilities or palliative care and private homes (Jaul, 2010). The inability of patients in mobilization is an important risk factor that can cause decubitus and more rapidly leads to progression of the lesion. In a study it was mentioned that in patients with prolonged bed rest, decreased albumin levels, fecal incontinence and fractures were significant factors causing decubitus (Allman, Goode, Patrick, Burst, & Bartolucci, 2015). The number of patient deaths in hospitals has tripled, one of which is due to decubitus (Raju, Su, Patrician, Loan, & Mccarthy, 2015).

Based on the Decree of the Minister of Health of the Republic of Indonesia Number: 129 / Menkes / Sk / II / 2008 About Minimum Hospital Service Standard states that the limit of tolerance of the incidence of nosocomial infection (decubitus) is <1.5% of the total incidence of decubitus in the Hospital. Decubitus incidence is still very high in hospitals in Indonesia, for example, the Hospital in Pontianak shows an average decubitus incidence of

around 29%. This mortgage is an extraordinarily high figure when viewed / compared from incubation of deCubitus in the Region of Asian Countries that is between 2.1% - 31.3% (Sanada et al., 2007). The quality indicator of nursing service can be a reference for assessing the quality of service that has been provided and can be used as the basis for assessing whether the quality of nursing is in a condition below the standard so that improvement programs are required, as per standards or above standards so that efforts are required to maintain DEPKES, 2008). Some Hospitals Make dekubitus as one indicator of nursing quality because dekubitus is one of nurse responsibility and can be used as an indicator of nursing service.

The purpose of this study was to conduct a systematic review of the factors that influence the occurrence of decubitus in patients with bed rest and physical limitations. In this study, the authors identified the journal publication of research results on factors causing decubitus including accompanying medical diagnoses, nutritional deficits, mechanical ventilation, skin moisture, age, sex, decreased mobilization ability, skin type, nurse workload, day care old, fecal incontinence, environmental humidity, body temperature, history

of smokers, lab results (albumin, hemoglobin, lymphocytes), skinfold triceps, blood pressure, sensory perception, friction, weight and underweight and mental status, particularly trauma spine, postoperative patient, history of diabetes, history of hypertension. The result of this systematic review is expected to be useful for the order of health services, especially in the effort of prevention of nosocomial infection, especially in this case is dekubitus. This systematic review is presented in the form of articles consisting of; abstract, introduction, method, result and discussion, implication to practice, conclusion, bibliography, and attachment.

2 METHODS

The method used in Systematic Review begins with the selection of the topic of Factors Related to Decubitus in Patient with Bed Rest and Physical Immobilization. Then determined the keyword to search articles with several databases such as EBSCO, Science Direct, SCOPUS, and Journal of Airlangga University. PICOT / PECOT Framework. Population: Patient bed rest and who have physical limitations. Exposure: Factors affecting the occurrence of decubitus. Outcomes: the occurrence of decubitus. Time: 2007-2017.

Based on the determination of keywords according to the topics contained in the PECOT framework in the database; Ebsco, Science Direct, Elsevier, Sage Journals, Scopus, ProQuest are limited to the last 10 years; 2007 to 2017 obtained 15 International Journal then. The English keyword used is Pressure Ulcer AND Risk Factors AND bedridden AND limited physically. Selection of articles. Search through the above keywords generate 96 articles, from all articles after reviewed the conformity with the topic then obtained 15 articles in English.

3 RESULTS

This review systematic reviewed 15 articles abroad. Articles from abroad come from Brazil, Switzerland, Birmingham, Australia, Pontianak. For articles originating from Indonesia that is Pontianak is expected to reflect the profile of Indonesian society in general, so that habits, posture, character and thoughts can be homogeneous and get results that describe the occurrence of Decubitus in Indonesia.

The results of the Systematic Review and PICOT of the 15 articles are included in the Matrix Table in Appendix 1. There are 8 journal of Cross Sectional Study, 2 journal retrospective study, 1 journal restrospective cohort study, 1 prospective study journal, 3 cohort prospective study. The number of samples varied from the smallest of 78 respondents (research by Mônica Suêla de Azevedo Macena, et al, 2017) and at most 2573 respondents (research by Andrea R. Fisher, et al, 2010). Measuring tools used in all studies is an observation sheet, questionnaire, Norton scale, Bradden scale and Waterlow scale. From the results of the review then obtained the results of factors that affect the occurrence of dekubitus written in the table below.

Table 1: Lists the factors that affect the occurrence of decubitus found from the 15 selected articles.

No	Risk Factor	Author Articles
1	Medical illness (50.3%), Deficit nutrients, Use of mechanical ventilation, Patients with complications of CKD, Pneumonia and patients with vasoactive drugs	(Becker et al., 2017)
2	Dryness / moisture of the skin, Mobilization, Demographic factors (age, sex)	(Lechner, Lahmann, Neumann, Blumpeytavi, & Kottner, 2017)
3	Braden scale score low (6-21), Age over 70 years, Have a diagnosis of diabetes mellitus	(Fisher, Wells, & Harrison, 2002)
4	Nurses work load, The severity of disease, age, Long lived in ICU	(Keller & Ramshorst, 2002)
5	1. Dependent (pressure ulcer development) : Interface factor, Network ischemia 2. Independent (risk factor): Fecal incontinence, Skin moisture, Environmental humidity, Albumin, Hemoglobin, Triceps skinfold, Diastolic blood pressure, Systolic blood pressure, Body temperature, Smoking	(Sanada et al., 2007)
6	Age, sex, sensory perception, moisture, mobility, nutrition, Friction	(Fisher et al., 2002)
7	the limitations of physical mobility, skeletal prominent, unbalanced nutritional status,	(Raju et al., 2015)

	moisture, mechanical factors (pressure, restrain, shearing forces), Norton scale ≥ 14 , Hipertermi, Excrecence, Age	
8	Underweight (BMI <19), Extremely weigt (BMI> 40)	(Hyun et al., 2014)
9	Malnutrition, Old age, Bedridden, Immobilization, Primary diseases (neurological and cancer disorders)	(Brito et al., 2013)
10	sensory perceptions, moisture, activity, mobilization, nutrition and friction, demographic factors (age and sex)	(Risco et al., 2011)
11	Age> 40 years, Installation of mechanical ventilator, Patients with spinal trauma	(Lauren A. Raff, Holly Waller, MPH, Russell L. Griffin, PhD, & Patrick L. Bosarge, 2018)
12	Malnutrition	(Banks et al., 2010)
13	age ≥ 75 years, dry skin, nonblancable erythema (decubitus stage 1), have previous decubitus history, immobilization, fecal incontinence, Tricep damage, limphopenia (limphocyte count $<1.5 \times 10 / L$), weight loss (<58 kg)	(Allman et al., 2015)
14	bed rest, malnutrition	(Perrone, Paiva, & Aguilar-birth, 2011)
15	Age, Tobacco consumption (smokers), History of diabetes, History of hypertension	(Suêla et al., 2017)

According to Table 1, various types of decubitus risk factors are mentioned by the authors. Risk factors include age, sex, history of diabetes mellitus, hypertension, dry skin, nonblancable erythema (decubitus stage 1), history of previous decubitus, immobilization, faecal incontinence, tricep damage, limphopenia (limphocyte count $<1.5 \times 10 / L$), weight loss (<58 kg), Mechanical ventilator installation, Patients with spinal trauma, malnutrition, Underweight (BMI <19), Extremely weigt (BMI> 40), limitations of physical mobility, skeletal prominent, nutritional status unbalanced, mechanical factor (pressure, restrain, shearing forces), Norton scale ≥ 14 , Hyperthermic, Excretion, sensory perception, moisture, friction, Interface factor, tissue ischaemia, fecal incontinence, skin

moisture, environmental humidity, Albumin, Hemoglogin, Triceps skinfold, Diastolic blood pressure, Systolic blood pressure, Body temperature, Smoking, Nurses workload, Braden scale score low (6-21) Medical illness (50.3%), Patients with CKD complications, Pneumoni a and patients with vasoactive drugs (Becker et al., 2017), Age over 70 years, Severity of disease, Long lived in ICU (ALOS). but there are a number of dominant or frequent factors causing decubitus from the above mentioned factors: limitation of mobilization and activity, nutrition, skin moisture and mechanical factors (pressure, restrain, shearing forces) and age factor (most often at age> 40 years)

The results of the above review found many factors that cause decubitus, but after the analysis it is concluded that the most common risk factors for decubitus are limited mobilization and activity, nutrition, skin moisture, mechanical factors (pressure, restrain, shearing forces) and factors age (most common at age> 70 years). Decubitus is not only caused by a single risk factor, but a combination of at least two risk factors.

1.1 The limitation of mobilization and activity

The limitation of mobilization and activity is the inability to change the position of the body, or part of the body, without help. Such inability can be caused by CNS depression, such as vegetative cases, stroke, or late-stage dementia, sensory impairment and spinal cord injury or in postoperative (musculoskelatal) patients (Jaul, 2010). Limitations of mobilization and activity are significant risk factors causing decubitus. As we mentioned earlier that the risk factors found do not singularly cause decubitus. The limitation of mobilization and activity is closely related to mechanical factors such as shear strength, pressure and restraints. In patients with limited mobilization and activi- ties, there is a risk of decubitus. As mentioned in the study ((Sciences et al., 2016) 80.5% of patients with limited mobilization experience decubitus

1.2 Nutrition

Decubitus and nutritional disorders have a very close relationship and they affect each other. It is more common in elderly patients, who are treated in both health and home facilities with limited economic, social, physical and mental status. Nutritional disorders (malnutrition) often begin with a lack of energy. Decubitus protein suggests a catabolic process accompanied by more protein consumption which will eventually cause tissue

damage (Jaul, 2010). In the treatment of patients with dekubitus caused by nutritional deficit factors there are some things to note that history of previous nutritional status, among others, about the history of nutrition (appetite, food intake, gastrointestinal symptoms); gastrointestinal disorders (diarrhea, vomiting, nausea); functional physical capacity; and physical assessment (fat loss, musclewasting, and presence of foot and sacral edema and ascites) (Brito et al., 2013). Dental conditions should be evaluated, including chewing and swallowing ability, supporting actors include social isolation, lack of accessibility of nearby families and povertyAwareness of medical personnel in drug use is minimized as it may cause digestive problems, decrease appetite, cause constipation and cause dryness of the mouth (Perrone et al., 2011).

1.3 Skin moisture

Decubitus is one of the serious health problems both in terms of medical and nursing. Therefore, prevention efforts are very important things to do. Risk factors that cause decubitus one of them is the moisture / dryness of the skin, therefore should always be considered in the treatment of patients who have risk factors tesebut. Dryness of the skin especially in areas of prominent and depressed body such as sacrum, ankle sanagt potentially cause injury (Lechner et al., 2017). Skin moisture is often associated with a state of fecal incontinence, sweating due to elevated body temperature. If the patient's body condition is moist and supported by impaired physical mobility, then the risk for decubitus to occur will be higher. As mentioned in the results of research that has been done by the hospital in Pontianak City (Sanada et al., 2007). In a study that has been done by (Sciences et al., 2016) mentions that 48% of patients with decubitus caused due to skin moisture due to urinary and faecal incontinence.

1.4 Mechanical factors (pressure, restrain, shearing forces)

Mechanical factors (pressure, shearing forces) are also risk factors for decubitus. In patients with decubitus tissue damage that pathologically causes prolonged pressure or friction can cause deformity in soft tissue (such as muscle tissue), prolonged pressure can lead to blockage of blood vessels and lymph nodes that will eventually lead to tissue necrosis (Lechner et al., 2017). Mechanical factors (pressure, shearing forces) can cause decubitus because it creates strain in the deeper part. Pressure can cause minor or substantial skin damage, but

pressure alone is not a direct cause of decubitus. Pressure may contribute to worsening decubitus conditions because the shear / shear cuts / wounds may increase the risk of tissue and membrane damage (Brienza et al., 2015)

1.5 Factors age (most common at age> 70 years)

Potential risk of exposure to decubitus increases especially in the elderly (over 70 years). Aging and environmental factors can cause skin damage, loss of elasticity, subcutaneous depletion, overall muscle mass reduction (sarcopenia), and decreased perfusion of intradermal blood vessels (Jaul, 2010). From the riview that has been done by (Suêla et al., 2017), sex also affects the incidence of decubitus. From the riview, it was found that dekubitus occurs more in women (52.6%) because it is affected by muscle strength, elasticity and elasticity, and high adipose tissue, thus increasing pressure on the tissues and causing cell hypoxia.

4 DISCUSION

Hospitals need to have a good quality of service to help the patient cure. Decubitus is one indicator of hospital service quality that reflects the quality of care, especially nursing. Unsurprisingly patients who come to the hospital to seek recovery are getting secondary infections from hospital services. Maintenance costs can also increase due to dekubitus experienced by a patient. By knowing the dominant factor affecting the occurrence of dekubitus that is location of installation, fluid osmolaritas given then hospital or pengampu policy in Hospital can follow up the factor as standard so that can prevent dekubitus and increase quality of service to patients.

5 CONCLUSIONS

Decubitus is one of the HAIs (Health Associated Infection's) caused by prolonged bed rest and physical limitation of the patient. Decubitus is a complication that is often encountered in hospitals that are classified as high risk (if not getting good care can cause death), high cost (generally decubitus patients have long day care), high volume (the number is relatively large, especially in intensive space) . Through this Systematic Review, the author tries to identify the factors that cause decubitus.

From 15 journals conducted the review got 5 factors that can influence dekubitus. The most common factors causing decubitus are intrinsic factor (nutrition, mobilization, humidity), external factors (friction) and demographic factors (age, especially in elderly). After knowing the causes of dekubitus is expected to be a reference in the prevention of dekubitus and can be applied in Health services. Subsequent research is expected to always pay attention to the factors that influence the incidence of decubitus when doing an intervention for both prevention and treatment

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