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Repositioning To Prevent the Risk Of Decubitus using Digital Skin Moisture Tools

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ABSTRACT

Stroke is the biggest contributor to the risk of decubitus in health care. This incident is due to immobilization which affects the moisture of the skin. Decubitus can worsen the patient's quality of life and lead to death. Prevention of the risk of decubitus is carried out by repositioning. Objective: find out the effect of repositioning on the risk of decubitus using Digital Skin Moisture. Method: quasi-experimental research with a non-equivalent control group design consisting of intervention and control groups. The sample is a stroke patient with immobilization, registered a maximum of 3x24 hours of first reception. Sixty people (30 intervention groups and 30 control group people) were recruited using purposive sampling techniques. The study was conducted over 3 months (July-September 2022). Results: the Mann-Whitney test showed that the post-test results of the intervention group experienced more skin moisture reduction (mean-rank 23.63) compared to the control group (mean-rank 37.37) with a significant value of $p=0.002<p=0.05$. Therefore, it was concluded that repositioning measures positively influenced the risk of decubitus seen from the moisture of the patient's skin. Conclusion: A stroke is a high-risk event of decubitus judging from skin moisture. Almost all stroke patients have abnormal skin moisture. Repositioning every 2 hours has a significant effect on reducing skin moisture. Skin moisture measurement can be used with Digital Skin Moisture Tools. This tool is highly recommended because it can provide accurate and fast information on the risk of decubitus.

Keyword: Stroke, Repositioning, Decubitus, Digital Skin Moisture Tools

INTRODUCTION

Stroke is the cause of disability and the third cause of death in the world's population (Abu, Arafat, and Syahrul 2020). A stroke occurs due to functional damage to the brain due to impaired blood flow and is the cause of paralysis of the limbs (Arafat et al. 2018). Paralysis requires treatment and long bed rest (Tenriwati and Asnidar 2018). Long bed rest will risk decubitus, which tops the list compared to common diseases (Rachmawati,

Ulum, and Sepdianto 2019). Decubitus damages skin and tissue due to prolonged friction and pressure (Ippolito et al. 2022).

The prevalence of decubitus in the world is different in each country (Seyhan 2018). In the United States, the incidence of decubitus reaches almost 30% of those that occur in hospital services. In the United Kingdom, the incidence of decubitus in stroke patients reaches 32%; in Europe, it is almost 23% (Meliza, Ritarwa, and Sitohang 2020). In Indonesia, the incidence of decubitus due to stroke reaches 33% and is the most common problem in hospitals (Zorrilla-Vaca and Makkar 2017). The high number of decubitus is the centre of attention for medical personnel because this can reflect poor health services and hospital quality (Seyhan 2018). Decubitus must be treated quickly and appropriately because of the risk of increased wound area, length of treatment, sepsis and death (Amir et al. 2017). Decubitus affects patients quality of life and requires a lot of funds (Alimansur and Santoso 2021). Maximum and comprehensive prevention is needed to treat this problem (Powers 2016).

Prevention of decubitus according to international standards is carried out by preventing malnutrition, repositioning and education (Primalia and Hudiyawati 2020). Repositioning is an easy procedure for patients and their families to apply (Gillespie et al. 2014). Regular repositioning can prevent the risk of decubitus and facilitate blood circulation (Meliza et al. 2020). The recommended repositioning is with a slope of 30 degrees with a duration of time every 2 hours (Ana 2016). Repositioning every 2 hours with a slope of 30o effectively reduces the risk of decubitus (Najihah et al. 2020). However, this action is not considered by health workers in hospital care (Citra, C. Sitompul, and Restuastuti 2017).

In addition to decubitus, stroke patients also often experience problems with skin moisture, such as increased and decreased humidity which is at risk of decubitus events (Endah Janitra et al. 2019). The increase in skin moisture is caused by sweat and diapers seeping, while the decrease in humidity is due to monotonous positions that tend to be 1 way. Therefore, prevention of decubitus is necessary as early detection of the risk of decubitus.

Early detection is a major component of decubitus risk assessment (Alimansur and Santoso 2021). So far, decubitus risk assessments have been carried out using the Norton and Braden scales (Tenriwati and Asnidar 2018). However, this tool does not assess the skin's moisture level, so it needs a tool that can assess it objectively. One skin flexibility

measuring device is the Digital Skin Moisture (Iskandar et al. 2019). The tool detects skin moisture levels, which is easy to apply and relatively cheap. The use of this tool helps nurses in assessing the risk of decubitus. So far, this moisture-measuring device has not been widely applied in hospitals, and no studies have reviewed the use of this tool. Therefore, we want to know how repositioning affects the risk of decubitus in stroke patients using Digital Skin Moisture Tools.

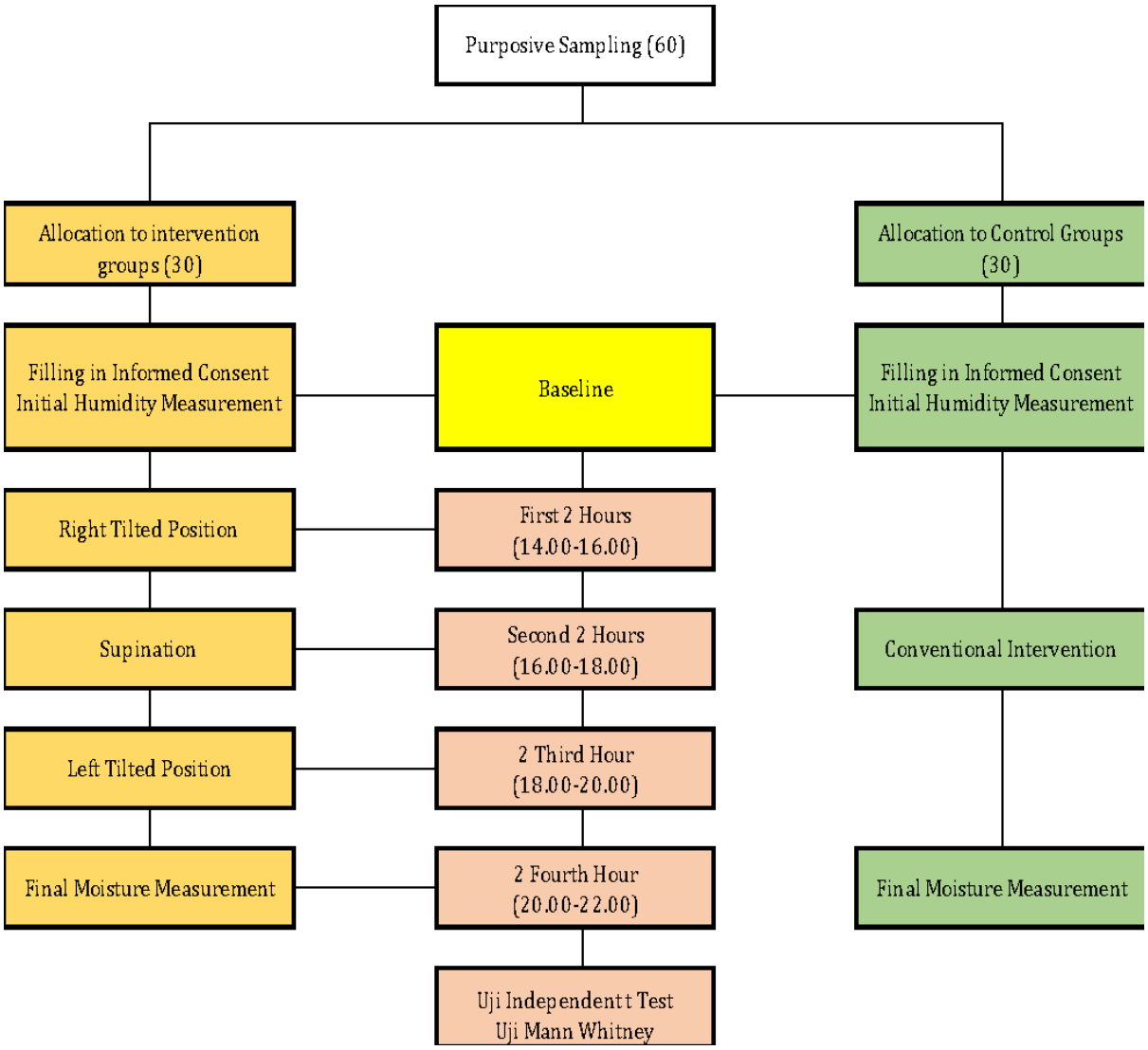
METHODS

This study used the quasi-experimental method with a non-equivalent control group design consisting of an intervention group and a control group (Joseph and Gupta 2021). The sample is a stroke patient with immobilization and registered for hospitalization a maximum of 3x24 hours at the time of the first admission to the hospital. Sixty samples (30 intervention and 30 control groups) were recruited using purposive sampling techniques. Only willing and qualified samples were recruited for the study. The study was conducted for 3 months, from July to September 2022.

The intervention group was given repositioning every 2 hours for 1 shift from 14.00-21.00 (8 hours), while the control group received treatment following hospital standards. The intervention and control groups were separated into different rooms, so there was no bias. In the end, the two groups were still given the same treatment after the assessment according to the study's objectives. Measurement of sacrum skin moisture is carried out before and after the intervention. The intervention group was given the first 2 hours of repositioning with the right oblique position, the second 2 hours in the supine position, the third 2 hours in the left oblique position and the last 2 hours we took the moisture measurement as the final value of the repositioning action. Our control group only measured the moisture value of the sacrum in the last 2 hours.

The results of the research we got were processed using the SPSS program. Data analysis using the Independent Test Sample t-Test provided that the data is normally distributed. However, if the data is not normally distributed, the analysis used is the Mann-Whitney test. The level of trust is said to have an influence when the significant value of $p<0.05$, and if $p>0.05$, the action given has no effect.

Research Flow



RESULTS

The study was conducted from July to August 2022 and carried out in Dadi Makassar hospital's stroke treatment room. The results of our study found that out of 60 total patients, the majority of those affected by stroke were 37 men (62%) (table 1). The average age of patients affected by stroke is 55-65 years (37%) (table 2). For the education level, the respondents who suffered the most strokes were those with a college background (table 4) with an employee employment status of 25 people (42%).

Table 1. Characteristics of Respondents Based on Demographic Data of Stroke Patients at Dadi Makassar Hospital

Gender	Frequency (F)	Percentage (%)
Male	37	62
Female	23	38
Age (Year)	**n**	**%**
45-54	20	33
55-65	22	37
66-74	18	30
College	26	43
High School	16	27
Junior High School	10	18
Primary School	4	6
No School	4	6
Job	**n**	**%**
Employees	25	42
Self-employed	17	29
Farmer	5	8
Fisherman	2	3
Not Working	11	18
Total	**60**	**100**

Table 2. Description of moisture value as a risk of decubitus in stroke

Group			Statistic	Std. Error
Intervention Group	Mean		43.400	.7247
	95% Confidence Interval for Mean	Lower Bound	41.918	
		Upper Bound	44.882	
	5% Trimmed Mean		43.130	
	Median		42.800	
Control Group	Mean		45.633	.5847
	95% Confidence Interval for Mean	Lower Bound	44.437	
		Upper Bound	46.829	
	5% Trimmed Mean		45.450	
	Median		44.800	

Based on the data in table 2, it was found that the skin moisture of stroke patients in 2 different groups was at an abnormal humidity level. Both groups had moist skin with average values of 43,400 (intervention group) and 45,633 (control group).

Table 3 Normality test of intervention groups and control groups 2022

Results	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pre-test intervention group	.392	30	.000	.727	30	.000
Post-test intervention group	.291	30	.000	.839	30	.000
Pre-test Control Group	.357	30	.000	.729	30	.000
Post-test Control Group	.359	30	.000	.740	30	.000

Based on table 3 shows that the pre-test value of the intervention group and the control group using the Shapiro-Wilk test obtained a value of p=0.000<p=0.05, while for the post-test of the intervention group and the control group, the significance value was the same as the pre-test value of p=0.000<p=0.05. It can be concluded that the data in the intervention and control groups are not normally distributed, so they must use a non-parametric test, namely the Wilcoxon test.

Table 4 Wilcoxon Test Effect of Repositioning On Decubitus Risk In Stroke

		N	Mean Rank	Sum of Ranks	Z	Asymp. Sig. (2-tailed)
Posttest-Pretest Intervention Group	Negative Ranks	14[a]	8.57	120.00	-2.982[b]	0.003
	Positive Ranks	2[b]	8.00	16.00		
	Ties	14[c]				
	Total	30				
Posttest-Pretest Control Group	Negative Ranks	2[a]	4.00	8.00		0.257
	Positive Ranks	5[b]	4.00	20.00		
	Ties	23[c]				
	Total	30				

The results of the Wilcoxon test in the intervention group showed a decrease in skin moisture values before repositioning (mean Rank 8.00) and after repositioning (mean rank negative 8.57). Statistically significant values p=0.003<p=0.05 can be interpreted to mean that repositioning affects the skin's moisture value. In the control group that was not given a repositioning, the mean rank value (4.00) did not change, and this was also seen in the value of p=0.257>p=0.05. So it can be concluded that no repositioning action can reduce the moisture level of the skin of stroke patients, which affects the risk of decubitus.

Table 5. Effect of Repositioning on Decubitus Risk in Stroke

	Group	N	Mean Rank	Sum of Ranks	Mann-Whitney	Wilcoxon	Z	Asymp. Sig. (2-Tailed)
Control	Intervention	30	23.63	709.00	244.000	709.000	3.047	0.002
	Control	30	37.37	1121.00				
	Total	60						

Based on the statistical test output in the Mann-Whitney test in table 5, it is known that the average decrease in skin moisture levels after the post-test intervention group experienced more decrease in humidity (mean-rank 23.63) compared to the control

group (mean-rank 37.37) significant value $p = 0.002 < p = 0.05$ with the meaning of Ha received. Therefore, it was concluded that there is an influence between repositioning measures on the risk of decubitus seen from the moisture of the patient's skin.

DISCUSSION

This study aimed to determine the effect of repositioning on the risk of decubitus of stroke patients using digital skin moisture tools. The results found that gender influences the incidence of stroke and will certainly affect the risk of decubitus (Colillas-Malet et al. 2020). Men are more at risk than women due to smoking factors that damage blood vessels (Nakao et al. 2020). However, several studies have found that the incidence of stroke occurs more in women in old age than men because it is due to menopause (Christensen and Cordonnier 2021; Fukuda et al. 2014; Manorenj et al. 2016; Poorthuis et al. 2017).

Age greatly influences stroke and decubitus, and ageing has a greater risk due to decreased elasticity of blood vessels, which results in damage (Chrysant and Chrysant 2014). Ageing is inevitable and changes because it occurs naturally and is a high-risk factor (Boehme et al. 2017). Liao et al.,(2019) stated that the high risk of decubitus in stroke patients is caused by ageing, which affects the recovery process for a long time.
The level of education is closely related to the patient's knowledge. Knowledge is the basis for society's awareness of healthy living behaviours (van der Heide et al. 2018). If it is associated with stroke, of course, this will happen to poorly educated people. However, recent occurrence of many highly educated people has had a stroke. An unhealthy lifestyle can cause this, for example, lack of exercise, stress and consumption of ready meals (García-Pérez-de-sevilla et al. 2021). Most people, especially in urban areas, prefer ready-to-eat food, and among them have frequent stress and little exercise because they are busy at work, which is a factor in the risk of damage to blood vessels resulting in stroke and the risk of decubitus (Farhud 2015).

People's employment status also has a relationship with stroke and the risk of decubitus. Those who have a job as an employee in an office will experience more stress due to the high workload and longer working time; this impacts their health status (Eshak et al. 2017). Office employees have longer working hours than those who are not time-bound. Long working hours lead many deaths due to stroke and ischemic heart disease (World Health Organization 2019). Stroke greatly affects the risk of decubitus seen in the skin's moisture level. We found that almost all stroke patients have skin moisture

problems in the moist and very moist range. Immobilization due to stroke is a contributing factor to this problem. Immobilization exerts a long-pressure effect on the patient's back surface, especially on the sacrum and other prominent areas (Ippolito et al. 2022). Shaked and Gefen (2013) stated that prolonged pressure on this area obstructs blood circulation, affecting the skin's dryness and moisturization. A problem often encountered in the field is the high humidity of the patient's skin in the back area and sacrum. Very moist skin will make the skin brittle and easily exposed to friction, so it becomes the beginning of decubitus. Another cause of high skin moisture in stroke patients is urinary incontinence (Arkan, Beser, and Ozturk 2018). However, the hospital standard for stroke patients uses a urine catheter; until now, the risk of decubitus is still a difficult problem and difficult to control, so the treatment requires careful and urgent management (Ikeda-Sakai et al. 2022).

Repositioning is indispensable in the handling of decubitus. Repositioning every 2 hours for 8 hours a day can reduce the skin's moisture level. We noticed a significant decrease in humidity after being given repositioning. Another study stated that repositioning every 2 hours can reduce the incidence of decubitus risk (Avsar et al. 2020). The repositioning action affects the circulation of blood and air on the surface of the back and sacrum so that the moisture level of the skin in this area tends to be stable. Repositioning also reduces the emphasis on protruding bone areas. Chitambira and Evans (2018) explained that patients who routinely reposition have a lower risk of decubitus than those who sleep in one unchanged position. Research conducted by Berlowitz et al. (2014) states that repositioning reduces the length of days of treatment and tends to be discharged quickly.

Moisture Tools tool. Humidity is important to pay attention to, and it is necessary to measure it as an objective value. However, so far, it is rarely found in hospital services. We highly recommend measuring skin moisture levels using digital skin moisture tools because this can provide accurate and fast information on the risk of decubitus.

CONCLUSION

A stroke is a high-risk event for decubitus assessed from skin moisture. All immobilized stroke patients have abnormal skin moisture levels. The skin moisture range of these patients is average in very humid conditions; However, there are findings of dry skin moisture, but this is rarely found because it is influenced by other conditions such as fever and dehydration. Repositioning is the right choice to reduce the risk of decubitus.

Repositioning every 2 hours for at least 8 hours a day significantly reduces skin moisture. Moisture measurement is carried out using Digital Skin Moisture Tools. This tool is very simple but can provide accurate information on skin moisture which can be a reference value in diagnosing diseases.

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