

APPLICATION OF HEAD ELEVATION ON INTRACARNIAL PRESSURE IN STROKE PATIENTS

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ABSTRACT

This study aims to determine the effectiveness of applying head elevation to intracranial pressure in stroke patients. This research method uses one data, namely a literature study. The results showed that head elevations of 0°, 15°, 30°, and 45° affected intracranial pressure in stroke patients. In conclusion, it shows that 30° more head elevation can improve the intracranial pressure problem, although the difference's value is not significant.

Keywords: Head Elevation, Intracranial Pressure, Stroke

INTRODUCTION

Stroke is a cerebral disease that causes rupture or narrowing of blood vessels in the brain (Ekacahyaningtyas et al., 2017). Stroke is the number three disease that causes the most death and disability in the world due to impaired brain function due to blockage of the blood supply to the brain (Mustikarani & Mustofa, 2020).

WHO (2022) stated that there were 5 million people died, and 10 million suffered brain function damage caused by stroke. according to Mustikarani & Mustofa, (2020) states that the incidence of stroke in Indonesia by age is more common in men as much as 15.8% than women.

Complications of stroke are disorders that occur in body organs caused by the stroke disease process (Sari, 2019). One of the complications in stroke patients is increased intracranial pressure (Ibrahim et al., 2021). Increased intracranial pressure (ICP), usually occurs 1-4 days but can also occur within a few hours at the time of stroke, causing decreased consciousness (Paradisma, 2019; Affandi & Panggabean, 2016).

Nursing care in hospitals for stroke patients can use Orem's self-care theory by providing minimal and partial assistance (Pertami et al., 2019). Assistance that can be provided in the nursing ward is in the form of post-stroke physical exercise, self-care, food and drink needs, assistance with taking medication, and assisting in a comfortable and beneficial patient position in the healing process (Priagung, 2021).

Increased intracranial pressure can be reduced by independent nursing therapy using the theory of 0°.15°, and 30° head elevation positions as an intervention to encourage smooth jugular venous drainage to the brain (Lam et al., 2020). Head elevation is a condition where the body and legs lie parallel while the head is raised 15° or 30° (Siswanti et al., 2021; Anderson et al., 2017).

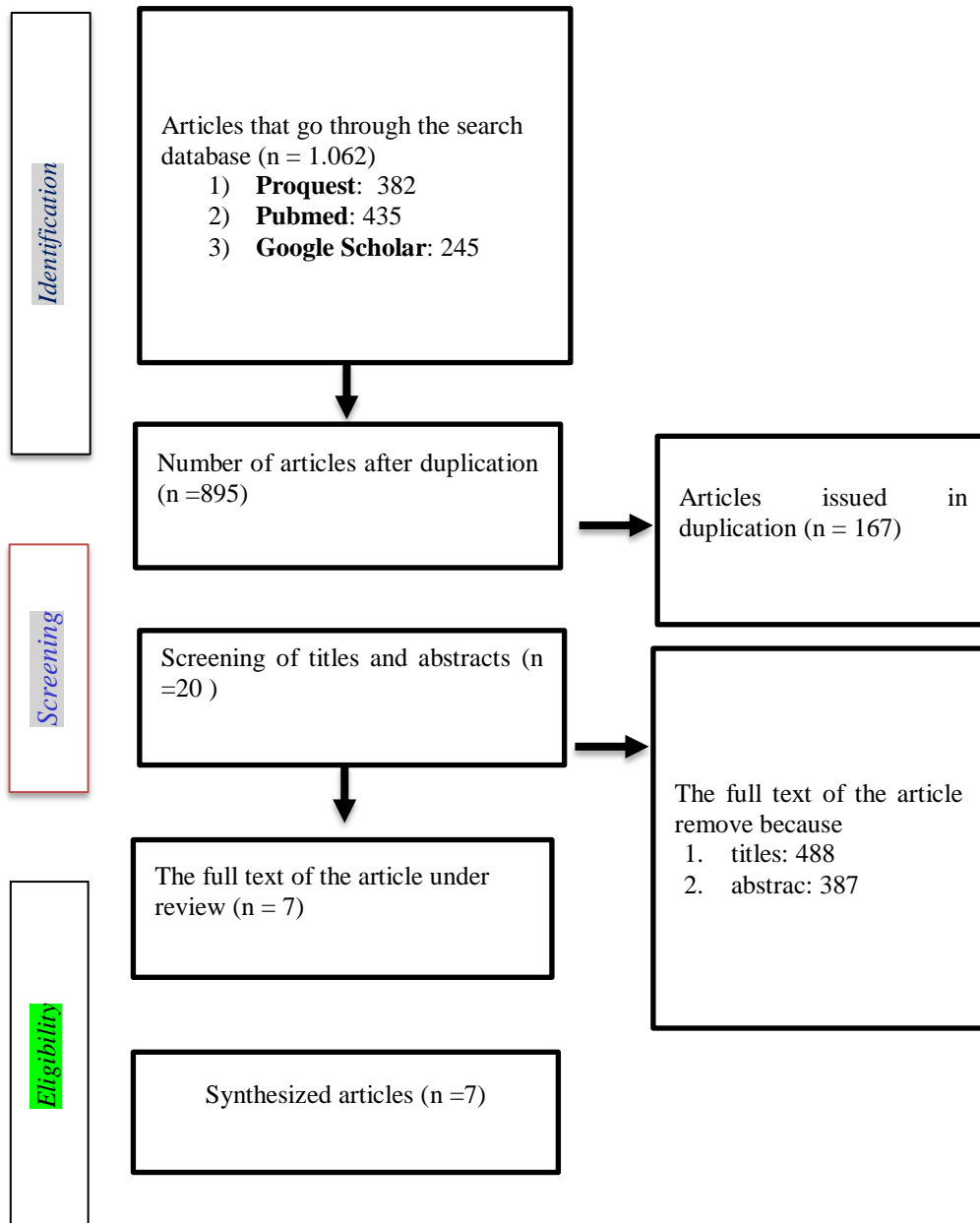
Insani (2021) said that the effect of the 30° head elevation position had an effect on increasing intracranial pressure in stroke patients. This is in line with the research of Ugras et al., (2018) that the head elevation position higher than 0° has a good effect on increasing

intracranial pressure in stroke patients. Based on this background, an analysis of the effect of the 30° head elevation position on intracranial pressure in stroke patients was conducted.

RESEARCH METHODS

This literature review uses previous research data with the PICO framework search strategy from the Google Scholar, Proquest and Pubmed database sources.

Initial search results were (1,062) articles. After duplicating a number of (895) articles. Screening of titles and abstracts (20) articles, full text and feasibility study stages as many as (7) articles, and then there are (7) articles synthesized in this literature review.



Picture. 1
Research Sample Scheme

RESULTS

Table. 1
Review Table

Author Name, Article Title, Literature Type	Year	Aims	Findings
Sari & Ismahmuhi, Analysis of Nursing Practice with 30° Head Elevation Innovation Intervention on Signs of Increased Intracranial Pressure and Oxygen Saturation Values in Stroke Patients in the Inpatient Unit of A.M Parikesit Hospital Tenggarong in 2017, <i>Quasi eksperiment</i>	2017	Aims to reduce intracranial pressure in stroke patients.	Head elevation of 30° is beneficial in reducing intracranial pressure in cases of head trauma, brain lesions, or neurological disorders and facilitates venous drainage from the head to correct ischemia.
Ugras et al., Effects of Different Head-of-Bed Elevations and Body Positions on Intracranial Pressure and Cerebral Perfusion Pressure in Neurosurgical Patients. <i>Quasi eksperiment</i>	2018	This study aims to examine the effect of head elevation position on intracranial pressure and cerebral perfusion pressure in stroke patients.	The difference in head elevation position of 15°,30°,45° caused a slight change in intracranial pressure and cerebral perfusion pressure which was not significant in stroke patients.
Purwanto, The Effect of Head Up 15 on the Average Arterial Pressure (Map) in Stroke Patients at Dr. Hospital. Soedono Madiun, <i>Quasi-experiment with a one- group pre-post test design approach</i>	2016	To determine the effect of Head Up 15° in stroke patients on MAP pressure in stroke patients	The results showed that there was an effect of Head Up 15° in stroke patients on intracranial pressure in stroke patients.
Hiola et al., The Effect of 30° Head Elevation Position on Changes in Intracranial Pressure in Non- Hemorrhagic Stroke Patients in the Neuro Inpatient Room at Toto Kabila Hospital, Bone Bolango Regency, <i>One group pre and post test design</i>	2018	This study aims to determine the effect of 30° head elevation on decreasing intracranial pressure in non- hemorrhagic stroke patients.	There is an effect of 30° head elevation position on the decrease in intracranial pressure with a p value of 0.008 in non- hemorrhagic stroke patients.
Limaretha, Case Study: Giving Head Up Position 30o to Intracranial Pressure (ICP) in Haemorrhagic Stroke Patients in Yudistira Room RSUD K.R.M.T. Wongsonegoro Semarang, <i>Literatur review</i>	2020	To determine the application of a head up 30° to signs of increased intracranial pressure.	The application of Head up 30° has a good effect on reducing the signs of increased intracranial pressure.

Burnol et al., Impact of Head-of-Bed Posture on Brain Oxygenation in Patients with Acute Brain Injury: A Prospective Cohort Study, <i>Prospective Cohort Study</i>	2021	To assess the effect of 0°, 15°, 30° head position on intracranial pressure and cerebral perfusion.	The head up 30° position was to 15°, and then to 0°, with a gradual increase in intracranial pressure. from 1.4–3.7 mmHg (P value <0.001); while from 30° to 0°, there was a change of 6.3–8.6 mmHg (P value <0.001), so a 30° head position was recommended.
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This literature review consists of 5 articles with a quasi-experimental design, one Prospective Cohort Study article, and one literature review article. Seven articles reviewed stated that head elevation positions 0°, 15°, 30°, and 45° had an effect on intracranial pressure in stroke patients, but the 30° position was preferred.

Based on table 1 shows that Head elevation of 30° is beneficial in reducing intracranial pressure in cases of head trauma, brain lesions, or neurological disorders and facilitates venous drainage from the head to correct ischemia. The head up 30° position was to 15°, and then to 0°, with a gradual increase in intracranial pressure. from 1.4–3.7 mmHg (P value <0.001); while from 30° to 0°, there was a change of 6.3–8.6 mmHg (P value <0.001), so a 30° head position was recommended. The difference in head elevation position of 15°, 30°, 45° caused a slight change in intracranial pressure and cerebral perfusion pressure which was not significant in stroke patients.

DISCUSSION

Stroke is a cerebral vascular disease that causes damage to brain function locally or globally (Sanjaya, 2015). Increased intracranial pressure (ICP) is a disorder of the nervous system that can result in decreased consciousness and even death (Insani, 2021).

Pertami et al., (2019) said that the assistance that can be provided in the nursing ward is in accordance with Orem's self-care theory by providing minimal and partial assistance. Assistance that can be provided in the nursing ward is in the form of post-stroke physical exercise, self-care, food and drink needs, assistance with taking medication, and assisting in a comfortable and beneficial patient position in the healing process (Priagung, 2021).

Nursing care in hospitals for stroke patients with increased intracranial pressure problems can be reduced by independent nursing therapy using head elevation positions 0°, 15°, 30°, and 45° as an intervention to encourage smooth jugular venous drainage to the brain (Lam et al., 2020). Head elevation is a condition where the body and legs lie parallel while the head position is raised 0°, 15°, 30°, and 45° (Siswanti et al., 2021).

The results of Ginting et al., (2020) said that there was an effect of giving a 30° head elevation on the level of consciousness in moderate head injury patients with a p value = 0.000. Wulandari (2019) in his research conducted in the Intensive Care Unit (ICU) of RSUD Dr. Achmad Mochtar Bukittinggi said for 3 days of giving a head elevation of 30°, the results showed an increase in cerebral tissue perfusion which was marked by increased awareness and vital signs within normal limits.

The results of this literature review state that 30° head elevation is useful in reducing intracranial pressure in cases of neurological disorders and facilitating venous drainage from the head to reduce ischemia (Sari & Ismahmudi, 2017). This is in accordance with research conducted by Hiola (2018) that the 30° head elevation position has an effect on decreasing intracranial pressure with a p value of 0.008 in non-hemorrhagic stroke patients. There is an effect of 30° head elevation position on the decrease in intracranial pressure with a p value of 0.008 in non-hemorrhagic stroke patients.

Limaretha (2020) stated that 30° head elevation can reduce signs of increased intracranial pressure such as increased GCS values, reduced headaches, nausea and vomiting stopped, eyesight became clearer, and the client seemed calmer. It is proven by the research of Pertami et al., (2019) that the 30° head-up position can inhibit blood flow to the brain in brain bleeding patients, resulting in changes in intracranial pressure in hemorrhagic stroke. Monitor Mean Arterial Pressure (MAP) in brain injury can reduce the risk of increased intracranial pressure (Insani, 2021).

The 30° head-up position is recommended to reduce bleeding in the brain in stroke patients with problems with increased intracranial pressure (Burnol et al., 2021). This is in accordance with the research of Oktaviani et al, (2021) that the 30° head elevation position is more recommended in nursing care for stroke patients, so that the 30° head position can be used in stroke patients with increased intracranial pressure problems.

Increased intracranial pressure can be reduced by independent nursing therapy using the theory of 0°.15°, and 30° head elevation positions as an intervention to encourage smooth jugular venous drainage to the brain (Lam et al., 2020). Head elevation is a condition where the body and legs lie parallel while the head is raised 15° or 30° (Siswanti et al., 2021; Anderson et al., 2017).

In the supine position accompanied by an elevated head position, the backflow of blood from the inferior to the right atrium is quite good because vascular resistance and right atrial pressure are not too high, so that the venous return to the right atrium is quite good. and right ventricular filling pressure (preload) increases, which can lead to increased stroke volume and cardiac output. Patients with the head up position 30o will affect blood flow in the brain (increase) and oxygen in the cerebral tissue to increase. The head elevation position is a change in position that aims to increase blood flow to the brain so that it can prevent the occurrence of increased ICP (Wulandari, 2019).

CONCLUSION

Stroke with the problem of increasing intracranial pressure can be performed nursing actions using head elevation positions 0°, 15°, 30°, and 45°. The more recommended head position based on the results of the review is head elevation of 30 ° although there is no difference that is too high with other positions.

SUGGESTIONS

This literature review can be used as a reference source in the management of stroke patients and the development of future research regarding the increase in head position 30° with the problem of increasing intracranial pressure in stroke patients.

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