International Journal of Health, Economics, and Social Sciences (IJHESS)
Vol. 8, No. 2, April 2026, pp. 939~947
DOI: 10.56338/ijhess.v8i2.10537
Website: https://jurnal.unismuhpalu.ac.id/index.php/IJHESS

Effectiveness of Abdominal Compresses on Constipation in Stroke Patients in the Neuro Room of Prof. Dr. Aloei Saboe Hospital

Pebriani Mustapa[1]*, Fadli Syamsudin[2], Rini Asnawati[3]
[1,2,3]Program Studi Ilmu Keperawatan, Fakultas Ilmu Kesehatan, Universitas Muhammadiyah Gorontalo

***Corresponding Author:** E-mail: pebrianimustapa6@gmail.com

Article Info

Article history:

Received 12 Dec, 2025
Revised 21 Jan, 2026
Accepted 14 Feb, 2026

Keywords:

Abdominal Compresses, Constipation, Stroke, Constipation Assessment Scale (CAS)

ABSTRACT

Constipation is an elimination problem that often occurs in stroke patients due to neurological disorders, immobilization, and a low-fiber diet. This condition can decrease comfort, hinder recovery, and trigger complications such as fecal impaction. Warm abdominal compresses are a nonpharmacological intervention that can improve intestinal motility. Objective: To determine the effect of abdominal compresses on the rate of constipation in stroke patients. Methods: This study used a pre-experimental design with a one group pretest-posttest design approach. The sample consisted of 15 stroke patients who were selected using accidental sampling techniques in the Neuro Room of Prof. Dr. Aloei Saboe Gorontalo Hospital. The intervention was in the form of abdominal compresses with Warm Water Zak at 40–50°C for 20 minutes every day for three days. The level of constipation was measured using the Constipation Assessment Scale (CAS). The normality test used the Shapiro-Wilk test and the statistical analysis used the Wilcoxon test. Results: After a warm compress intervention in the abdomen for 3 days, the category of non-constipation increased from 0 respondents (0%) to 2 respondents (11.8%), mild constipation of 2 respondents (11.8%) increased to 11 respondents (64.7%), moderate constipation of 10 respondents (58.8%) decreased to 2 respondents (17.6%), and severe constipation of 4 respondents (29.4%) decreased to 2 respondents (5.9%). The Wilcoxon test showed a value of $p = 0.000$ ($p < 0.05$), indicating a significant effect of abdominal compression on the reduction of constipation. Conclusion: Abdominal compresses are effective in lowering the rate of constipation in stroke patients. This intervention is safe, easy to implement, and can be recommended as a nonpharmacological nursing measure to improve elimination function in stroke patients.

INTRODUCTION

Stroke is a sudden impairment of brain function with clinical manifestations, both focal and global, lasting more than 24 hours (Putri *et al*., 2024). It is estimated that one in four people in the world will experience a stroke in their lifetime (*World Stroke Organization,* 2021). Death of brain tissue can lead to loss of functions controlled by that network (Mobiliu & Tomayahu, 2021). . Every six seconds, one individual loses his or her life to a stroke and people affected by a stroke experience an estimated increase in production time loss of 32.5% by 2020 (Yunus *et al*., 2024). The worldwide stroke rate is 15 million people every year, one-third of whom die and one-third are permanently disabled (Mutiarasari, 2019). Data from *the World Health Organization* (WHO) shows that 7.9% of all deaths in Indonesia are caused by stroke. Data from Riskesdas (2018) states that the prevalence of stroke based on doctor's diagnosis, the province with the highest stroke is in East Kalimantan Province (14.7%) and the lowest in Papua Province (4.1%). In 2018 alone, Gorontalo (10.9%) was for stroke patients in Indonesia.

According to Ardi *et al*. (2024) One of the impacts of neurological stroke is constipation. Constipation in stroke patients can be caused by several factors, including muscle weakness due to hemiparesis that makes the patient unable to move optimally, prolonged immobilization in bed, and disorders in the autonomic nervous system that regulates intestinal motility (Saputri *et al*., 2024). In addition, the use of certain medications such as opioid analgesics and antihypertensives can also worsen the condition of constipation. Untreated constipation will increase the risk of other complications, such as discomfort, abdominal pain, stool retention, and even intestinal obstruction, so further management is needed (Makmun *et al*., 2023).

Management of constipation in patients with stroke can be done through pharmacological and non-pharmacological approaches. Pharmacological approaches include the use of osmotic or saline laxatives such as *polyethylene glycol* (PEG/*Macrogol* 3350), the use of laxatives, and bulk-forming agents such as psyllium working by increasing fecal mass. Non-pharmacological management is recommended as a first step through increasing fiber consumption, fluid intake, and physical activity that have a positive impact on the patient's muscle strength, ensure smooth blood circulation, improve the body's metabolic function, and support the performance of vital organs (Yunus *et al*., 2024). Another intervention is warm compress therapy.

Warm compress therapy in the abdominal area is also effective against constipation, especially in patients with limited mobility (Makmun *et al*., 2023). This warm compress therapy is carried out by providing local heat using *a Warm Water Bag/Zak* filled with warm water at a temperature of about 40ºC which is attached to the abdominal area for 15–20 minutes. The heat produced works through the mechanisms of vascular vasodilation, relaxation of the abdominal muscles, and stimulation of the parasympathetic nerve which can increase intestinal motility thereby facilitating intestinal peristaltics (MP *et al*., 2022).

This research was supported by Eshagi *et al*. (2024) showed that the administration of local heat therapy using a hot water bag with a temperature of 50°C placed in the abdominal area had a significant effect on the consistency of feces and the frequency of defecation in elderly patients. The results of the study explained that in the intervention group there was an improvement in the quality of bowel movements compared to the control group that only received warm compresses at 25°C, where most of them did not experience defecation. These findings reinforce the evidence that abdominal heat therapy can be an effective, simple, and safe nonpharmacological nursing intervention in reducing constipation.

A preliminary study conducted in September 2025 at Prof. Dr. Aloesaboe Hospital, found that the data of stroke patients in the last 3 months with stroke, ischemic stroke, and hemorrhagic stroke diagnoses amounted to 81 patients, based on the results of interviews with the head of the G3 room under neuro, for stroke patients can experience constipation due to weakness in the nervous system, thereby affecting intestinal motility with interventions given in the form of eating foods high in fiber, drinking water, gradual mobilization, enema and drug collaboration are not yet practiced, but simple interventions such as warm compresses in the abdominal area have never been applied in the room. Based on the above background, the researcher is interested in conducting a research entitled "The Effectiveness of Abdominal Compresses on Constipation in Stroke Patients in the Neuro Room of Prof. Dr. Aloei Saboe Hospital".

RESEARCH METHODS

The design used in this study is pre-experimental with a one group pretest posttest design. The data obtained after the first observation (*pretest*) was carried out first before the intervention was given, after which the intervention (treatment) was given, after that the second observation (*posttest*) after the intervention was given. This research will be carried out in the Neuro G3 Room under Prof. Dr. Aloe Saboe Hospital, Gorontalo City. The research time was carried out from December 1 to December 15, 2025.

Population and Sample

Population is the entire object of research or object being studied. The object is in the form of a person, event, behavior or something that will be researched. The population in this study was all ischemic stoke patients who were constipated. The total population of stroke patients with a total sample of 51 people in the last three months. In this study, the author used *an accidental sampling technique*, namely the respondents encountered during the research.

Data Analysis Techniques

Univariate *analysis*

Univariate analysis is data related to the measurement of one variable at a certain time (Sugiyono, 2018). This study uses *univariate analysis*. The presentation of the results of the data analysis will later use a frequency distribution table in the form of frequency, the percentage of characteristics of respondents of the research variable.

Bivariate *analysis*

Bivariate analysis is an inferential data analysis used to find out how well an independent variable affects a dependent variable. Data analysis using statistical tests was carried out by following data processing

and tabulation. Before testing statistics, do a normality test first using Shapiro Wilk because the response is less than 50. The results of the normality test if the GIS < 0.05 data is abnormally distributed, then the *Wilcocxon test* is used, and if the GIS value > 0.05 is normally distributed data, then the *paired t test* is used (Notoatmodjo, 2018). To test the research hypothesis (significant test), the criteria for hypothesis acceptance are: if the value of (ρ) ≤ 0.05 then H0 is rejected, i.e. there is an influence and if (ρ) ≥ 0.05 then H0 is accepted, meaning there is no effect.

RESULTS

Univariate Analysis

Table 1 is based on gender, patient activity, patient diet, age, and intestinal noise in non-hemorrhagic stroke who experienced constipation at Prof. Dr. Aloesaboe Hospital, Gorontalo City.

Variable	Categories	Frequency (*f*)	Percentage (%)
Gender	Male	8	47.1
	Squirrelly	9	52.9
	An	17	100
	Total		
Activities	Activities	9	52.9
Patients	Low	6	35.3
	Activities	2	11.8
	Medium	17	100
	High activity		
	Total		
Diet Pasein	Low	9	52.9
	Fiber	6	35.3
	Enough	2	11.8
	Fiber	17	100
	Height		
	Fiber		
Respondent Age	52 years old	1	5.9
	54 years old	1	5.9
	55 years old	1	5.9
	57 years old	1	5.9
	58 years old	1	5.9
	59 years old	1	5.9
	61 years old	1	5.9
	63 years old	1	5.9
	64 years old	1	5.9
	66 years old	2	11.8
	68 years old	1	5.9

	70 years	2	11.8
	72 years old	1	5.9
	73 years old	1	5.9
	75 years old	1	5.9
Intestinal noise	1 x/min	2	11.8
	2 x/min	3	17.6
	3 x/min	6	35.3
	4 x/min	4	23.5
	6 x/min	1	5.9

Based on Table 1, the characteristics of respondents of non-hemorrhagic stroke patients who experienced constipation at Prof. Dr. Aloesaboe Hospital, Gorontalo City, showed that male respondents amounted to 8 people (47.1%) and women amounted to 9 people (52.9%). Based on patient activity, most of the respondents had low activity, namely 9 people (52.9%), followed by moderate activity as many as 6 people (35.3%), and high activity as many as 2 people (11.8%). Based on the patient's diet, the majority of respondents had a low-fiber diet of 9 people (52.9%), a low-fiber diet of 6 people (35.3%), and a high-fiber diet of 2 people (11.8%).

The age characteristics of the respondents showed that the age of the respondents was spread in the range of 52 to 75 years. Respondents aged 52, 54, 55, 57, 58, 59, 61, 63, 64, 68, 72, 73, and 75 years old amounted to 1 person (5.9%) each. Respondents aged 66 years and 70 years each amounted to 2 people (11.8%). Based on intestinal noise, respondents with 1 x / minute of intestinal noise amounted to 2 people (11.8%), 2 x/minute as many as 3 people (17.6%), 3 x/minute as many as 6 people (35.3%), 4 x/minute as many as 4 people (23.5%), 6 x/minute as many as 1 person (5.9%), and 7 x/minute as many as 1 person (5.9%).

Table 2. Characteristics of respondents based on pre test constipation assessment scale scores

Variable	**Categories**	**Freku e nsi (*f*)**	**Percentage or (%)**
Pre test constipation Assessment Scale	Mild constipation	2	11.8
	Moderate constipation	10	58.8
	Severe constipation	5	29.4

Based on Table 2, the majority of respondents before the intervention were in the category of moderate constipation, which was 10 respondents (58.8%). Furthermore, 5 respondents (29.4%) experienced severe constipation, and only 2 respondents (11.8%) were in the category of mild constipation. These results show that before being given the intervention, most stroke patients experience elimination problems in the form of moderate to severe constipation, which can be affected by immobilization, diet, and age.

Table 3. Characteristics of respondents based on post test constipation assessment scale scores

Variable	**Categories**	**Frequency nsi (*f*)**	**Percentages e (%)**
Post Constipation test Assessment Scale	No constipation	2	11.8
	Mild constipation	11	64.7

Moderate constipation	2	11.8
Severe constipation	2	11.8

Based on the results of the Constipation Assessment Scale (CAS) post-test measurement in Table 3, after the intervention was given, there was an improvement in the level of constipation in the respondents. Most of the respondents were in the category of mild constipation, namely 11 respondents (64.7%), and 2 respondents (11.8%) were already in the category of non-constipation. Meanwhile, the number of respondents with moderate constipation decreased to 2 people (11.8%), and severe constipation to 2 people (11.8%). The improvement in the level of constipation is also shown by a decrease in the average score of the Constipation Assessment Scale. The average constipation score before the intervention was 10.75, then decreased to 6.82 on the post-test measurement. Thus, there was a mean difference of 3.93 points, which indicates a decrease in the level of constipation after the intervention.

Bivariate Analysis

Table 4. Normality Test of Constpation Assessment Scale Pre test and Post test scores

Variable	Shapiro Wilk Sig.	Remarks
Pre-Test CAS	0.001 (<0.05)	Abnormal
Post Test CAS	0.001 (<0.05)	Abnormal

On Table 4 above Obtained Scores Pre Test and Post Test the value of Constpation Assessment Scale Sig. 0.001 < 0.05, from the Shapiro-Wilk value of this study the normality test was not fully met, then a bivariate analysis was carried out using the Wilcoxon statistical test.

Table 5. Wilcoxon Constpation Assessment Scale Pre test and Post test of the Effectiveness of Abdominal Compresses on Constipation in Stroke Patients in the Neuro Room of Prof. Dr. Aloei Saboe Hospital

Variable	Average	Save g Baku	P Value	N
Pre-Test	3.1765	0.63593	0.000	17
Post Test	2.2353	0.72761		17

Source: Primary Data 2025

Table 5 The average *Constpation Assessment Scale* score before being given abdominal compress intervention was 3.1765 and a standard deviation of 0.63593 and after being given abdominal compress intervention with an average *Constpation Assessment Scale* value of 2.2353 with a standard deviation of 0.72761. The results of the Wilcoxon test were obtained p valuae = 0.000 (<0.05) meaning that Abdominal Compresses are effective against Constipation in Stroke Patients in the Neuro Room of Prof. Dr. Aloei Saboe Hospital

DISCUSSION

Pre Test *Constipation Assessment Scale* value before warm compress

Most of the respondents experienced moderate constipation before the warm abdominal compress intervention, which was as many as 10 respondents (58.8%). This study also showed that 5 respondents (29.4%) experienced severe constipation and 2 respondents (11.8%) experienced mild constipation. These findings showed that as many as 88.2% of respondents were at the level of moderate to severe constipation before the intervention. Berkman et al. (2015) stated that stroke patients have a prevalence of constipation of 30–60%, especially in patients with limited mobility and neurological disorders. The average age of respondents reached 63.70 years with an age range of 52–75 years. Old age causes a decrease in intestinal motility due to reduced gastrointestinal smooth muscle tone. Martono and Pranaka (2020) explain that old age decreases the gastro-colic reflex and slows down the transit time of the colon, thereby increasing the risk of constipation in stroke patients.

Most of the respondents had a low level of physical activity, which was as many as 9 respondents (52.9%). Low physical activity decreases intestinal peristaltic movements and slows down fecal excretion. Cui et al. (2024) stated that physical activity increases gastrointestinal smooth muscle contraction and accelerates intestinal transit, so post-stroke immobilization increases the incidence of constipation. Most of the respondents consumed a low-fiber diet, which was as many as 9 respondents (52.9%). Low fiber intake reduces stool volume and increases stool hardness. Wirdayana and Al Rahmad (2023) mentioned that a low-fiber diet increases the risk of constipation, especially in patients with impaired mobility and neurological function.

The results of the study showed that the frequency of intestinal noise in the respondent was in the range of 1–7 times per minute with an average of 3.2 times per minute. Low frequency of intestinal noise indicates intestinal peristaltic hypoactivity. Smeltzer and Bare (2018) explain that decreased intestinal noise reflects gastrointestinal motility disorders due to decreased stimulation of the parasympathetic nervous system. The gender distribution of respondents showed a relatively balanced number, namely 9 female respondents (52.9%) and 8 male respondents (47.1%). Abdu and Seyoum (2022) stated that post-stroke autonomic nervous system disorders affect intestinal motility without significant differences by sex.

Overall, the characteristics of the respondents showed a high incidence of constipation before the intervention, which was 88.2% in the moderate to severe category. Old age, low physical activity, low-fiber diet, and low frequency of intestinal noise contribute to the occurrence of constipation in non-hemorrhagic stroke patients. Stroke interferes with the function of enteric neurons, thereby slowing down gastrointestinal transit and aggravating constipation (Guyton & Hall, 2021)

Post Test *Constipation Assessment Scale* value after warm compresses on the abdomen

After the intervention of warm compresses in the abdomen for 3 days, the distribution of the category of constipation shifted towards improvement. The number of respondents who did not experience constipation increased from 0 respondents (0%) to 2 respondents (11.8%). The number of respondents with mild constipation increased significantly from 2 respondents (11.8%) to 11 respondents (64.7%), the number of respondents with moderate constipation increased from 10 respondents (58.8%) to 2 respondents (11.8%), and the number of respondents with severe constipation decreased from 5 respondents (29.4%) to 2 respondents (11.8%). This change showed that as many as 12 respondents (70.5%) experienced a decrease in the severity of constipation after the intervention.

Respondents who reached the non-constipation category as many as 2 people (11.8%) showed an optimal response to heat therapy. These respondents had better mobilization activities, fluid intake ≥1500 ml/day, and a diet containing fiber, so the vasodilation and relaxation effects of the intestinal smooth muscles of the warm compress were synergistic with other supporting factors. Wena, Manan, and Sarce (2024) stated that increased local abdominal temperature increases tissue perfusion and stimulates the peristaltic reflex, thereby accelerating intestinal transit and facilitating defecation.

Most respondents with moderate constipation before the intervention (10 respondents; 58.8%) experienced a downgrade to the category of mild constipation (8 respondents; 47%). This decrease occurs because warm compresses cause relaxation of the smooth muscles of the colon, decrease intestinal spasms, and increase the frequency and strength of peristaltic waves. Sumiaty et al. (2022) explain that local heat lowers muscle tension, increases splanchnic blood flow, and optimizes the defecation reflex, so that feces move more easily towards the rectum.

Respondents with severe constipation before the intervention as many as 5 respondents (29.4%) showed partial improvement, of which 3 respondents (17.6%) experienced a decrease to the category of moderate constipation, and 1 respondent (5.9%) experienced a decrease to the category of mild constipation. This improvement suggests that heat interventions effectively reduce the severity of constipation, although it does not always immediately reach normal conditions. The decrease in the degree of constipation from severe to mild in 1 respondent (5.9%) can be influenced by the individual condition of the respondent, who has relatively better physical activity, a diet with adequate fiber intake, and a high level of cooperation during the treatment process and the implementation of the intervention. Better physical activity can improve mechanical stimulation of the intestinal wall, while adequate fiber intake plays a role in increasing the volume and consistency of stool, thereby speeding up intestinal transit. In addition, the patient's cooperative attitude allows the intervention to be carried out optimally and consistently, so that the effects of abdominal heat therapy can work more effectively.

Thus, 2 respondents (11.8%) remained in the category of severe constipation after the intervention. Both respondents refused the installation of a nasogastric tube (NGT) and experienced abdominal distension and decreased intestinal noise. NGT rejection causes gastrointestinal decompression inoptimality, so that gases and intestinal contents remain retained. Guyton and Hall (2021) explain that unresolved intestinal distension inhibits effective peristaltic contractions, so local heat is not strong enough to cope with severe motility disorders without additional intervention support.

The severity of constipation in stroke patients is influenced by several factors, namely the level of immobilization, fluid intake, fiber intake, drug use, and neurological disorders. Respondents with mild constipation generally had a frequency of defecation ≥3 times/week and soft stools, while respondents with moderate constipation experienced a frequency of defecation <3 times/week, hard stools, and need straining. Respondents with severe constipation showed no >5-day defecation, abdominal distension, and tenderness (Smeltzer & Bare, 2018).

If constipation is not treated adequately, this condition can cause serious complications, such as fecal impaction, paralytic ileus, rectal bleeding, and intestinal perforation. Bharucha et al. (2019) stated that chronic constipation in neurological patients increases the length of hospitalization and the risk of gastrointestinal complications. Therefore, in addition to warm compresses, supportive interventions such as laxative administration, a high-fiber diet (20–30 g/day), and adequate fluid intake are necessary in cases of moderate to severe constipation.

Overall, the results of this study show that warm compresses of the abdomen provide a positive clinical effect on reducing the degree of constipation. This intervention improved smooth muscle relaxation, improved blood flow, and stimulated intestinal peristalsis, resulting in a majority of respondents experiencing an improvement in the constipation category. However, in patients with severe gastrointestinal disorders and refusal of additional interventions such as NGT, the effectiveness of warm compresses becomes limited, so a multimodal approach is needed in the management of constipation.

The application of heating and heat to the bladder is related to the heat healing effect, namely reducing muscle tension, muscle stiffness and increasing blood flow, thereby stimulating intestinal peristaltic movement. To stimulate an increase in volume, warm compresses can be applied to the abdominal area. Warm intestinal peristaltic movements are effective in improving blood circulation, reducing pain, causing warmth, stimulating intestinal peristaltic movements and muscle stretching (Sumiaty et.al, 2022).

Heat treatment improves capillary protection, cell metabolism, muscle relaxation, increases inflammation, increases blood flow to specific areas, and relieves muscle pain, provides a positive effect and reduces joint stiffness by reducing the viscosity of synovial fluid (Sumiaty et.al, 2022). Thermal insulation is a compression technique in which the heated core is wrapped in a cloth to transfer heat to the body. Providing warmth is a practice that everyone can do, both in the hospital and at home.

The benefit of this warm compress treatment is that it can reduce muscle stiffness, improve relaxation, and reduce muscle stiffness. This treatment is very simple at home and is the first intervention to improve intestinal peristaltic motion (Menga et al., 2023). These results showed a significant improvement after being given warm compresses. This change in category shows that the intervention provides a relaxation effect of smooth muscles, smoothing blood flow, and improving intestinal peristalsis.

Analyzing the Effectiveness of Abdominal Compresses on Constipation in Stroke Patients in the Neuro Room of Prof. Dr. Aloei Saboe Hospital

The results of statistical analysis using the Wilcoxon test showed that there was a significant difference between the CAS value before and after the administration of a warm abdominal compress, with a value of $p = 0.000$ ($p < 0.05$). This shows that Abdominal Compresses are effective against Constipation in Stroke Patients in the Neuro Room of Prof. Dr. Aloei Saboe Hospital. According to Ardi *et al*. (2024), the factors that affect constipation in patients with hemorrhagic stroke are age where Constipation increases at the age of >60 years. The risk of constipation increases in the elderly population due to insufficient fiber and fluid intake, decreased physical activity, and comorbidities such as neurological and metabolic diseases, (Sulisnadewi et al 2023). According to Martono and Pranaka (2020), increasing age is related to a decrease in intestinal motility due to weakening of smooth muscle tone, reduced sensitivity of gastro-colic reflexes, and decreased activity of the parasympathetic nervous system. Degeneration of enteric neurons in old age causes the peristaltic response to be slower. This condition explains why the majority of respondents in this study were in the elderly age group and experienced constipation.

Constipation that occurs in the elderly group, gender, and family history are risk factors that cannot be modified. Abdu and Seyoum (2022) explain that men have a higher risk of stroke due to hormonal and lifestyle factors, such as smoking and alcohol consumption, which contribute to vascular dysfunction. This vascular dysfunction can interfere with the regulation of the autonomic nervous system, specifically parasympathetic activity which plays a role in intestinal peristaltic stimulation, a decrease in parasympathetic activity will decrease the frequency and strength of intestinal contractions. Warm compresses of the abdomen, able to activate thermal receptors on the skin associated with an increase in parasympathetic response. Thus, despite the gender differences in respondents, the mechanism of action of warm compresses can theoretically correct impaired intestinal motility through autonomic nerve pathways.

Another influencing factor is physical activity which plays an important role in stimulating the gastro-colic reflex, which is a reflex that increases colon motility after the presence of mechanical and neural stimuli. Cui et al. (2024) state that body mobility increases gastrointestinal smooth muscle contraction and accelerates intestinal transit. In stroke patients, neurological deficits cause immobilization that reduces the stimulation of

this reflex, thereby increasing the risk of constipation. Natural physiological stimuli (physical activity) cannot be performed, so external stimuli are required. Warm compresses of the abdomen act as a substitution stimulus that provides a relaxation effect of smooth muscles and increased blood flow, thus helping to trigger intestinal peristaltic even if the patient is in bed rest conditions.

Nutritional factors also have an effect, dietary fiber functions to increase the volume of feces and accelerate colon transit time through increased intraluminal pressure. Wirdayana and Al Rahmad (2023) explain that low fiber intake causes stools to become hard and their movement slows down, thus triggering constipation. In stroke patients, limited swallowing and dependence on caregivers often lead to insufficient fiber intake. Local heat in the abdomen can improve tissue elasticity and relaxation of the intestinal smooth muscles, thus facilitating the movement of stool even if the volume of stool is less than optimal, therefore, warm compresses serve as a supportive intervention that helps improve elimination in patients on a low-fiber diet.

According to Smeltzer and Bare (2018), the parasympathetic nervous system has a dominant role in regulating intestinal motility. Non-hemorrhagic stroke can cause damage to the nerve control centers in the brain which has an impact on decreased parasympathetic activity, resulting in intestinal peristaltics becoming slow. This is reflected in the findings of the study in the form of hypoactive intestinal noise frequencies. Physiologically, warm compresses work by increasing vasodilation and blood flow in the abdominal area, thereby helping to relax the smooth muscles of the intestines and stimulating increased peristaltic activity. This mechanism facilitates the movement of feces and accelerates intestinal transit, resulting in an improvement in constipation symptoms.

Research by Eshaghi, Norouzadeh, and JadidMilani (2024) shows that abdominal heat therapy has significant effectiveness in lowering constipation. The results of the study explained that applying heat to the abdominal area can improve intestinal function, improve the consistency of stool, and reduce constipation levels. There were significant differences on the first day ($p = 0.001$) and the second day ($p = 0.005$) after the intervention, so abdominal heat therapy may be recommended as an effective nonpharmacological approach, especially in elderly patients hospitalized.

In addition, research by Wena, Manan, and Sarce (2024) also strengthens the evidence on the effectiveness of nonpharmacological interventions on constipation. Through a quasi-experimental design on ICU patients, this study compares abdominal massage and warm compresses using *the Constipation Assessment Scale* (CAS). The results showed that both interventions were effective in lowering constipation levels, but abdominal massage had a more significant decreasing effect (mean score reduction of 6,400) compared to warm compresses (3,900). However, warm compresses have still been proven to be able to improve the category of constipation from the initial condition.

Heat stimulation in the abdomen stimulates vasodilation, increases the supply of oxygen and nutrients to tissues, as well as activates thermal receptors in the skin related to increased parasympathetic activity. This condition triggers gastrointestinal motility, accelerates peristaltic movements, and reduces intestinal smooth muscle spasms. Some literature also suggests that heat stimulation can reduce abdominal tension, reduce distension, and facilitate the movement of stool through the colon, thus supporting improved bowel function.

Research conducted by Vianingsih et al, (2024) Stroke patients who experience a decrease in intestinal peristalsis, namely bedrest patients who experience constipation problems, warm compresses and abdominal massage are carried out which aim to stimulate intestinal peristalsis, decrease colon transit, improve digestive function properly, warm compresses are carried out for 10-15 times a day with a temperature of 37^{0C} while abdominal massage is done for 10x/minute after warm compresses and done for 1 day 1x. The cause of intestinal peristalsis is lack of consumption of nutritional fiber or lack of drinking water.

Overall, the set of research findings and physiological theories suggest that abdominal warm compresses are an easy-to-apply, inexpensive, safe, and scientifically sound nursing intervention in improving intestinal motility. This intervention is particularly relevant for use in patients with immobility such as stroke, who are at high risk of developing constipation due to decreased physical activity and changes in neurological function. Thus, warm compresses can be recommended as one of the effective nonpharmacological interventions to improve the quality of defecation and prevent constipation complications in patients with mobility disorders.

CONCLUSION

The majority of respondents were at the age of >50 years (58.8%), with the gender being 52.9% female and 47.1% male. Most had a low-fiber diet (64.7%) as well as minimal poststroke physical activity (70.6%), thus increasing the risk of constipation.

Before abdominal compresses, the majority of respondents experienced moderate constipation (58.8%) and (29.4%) severe constipation, indicating a high incidence of constipation in stroke patients.

After 3 days of abdominal compresses, there was an improvement: 11.8% were unconstipated, 64.7% were mild constipation, moderate constipation was 17.6% and severe constipation was 5.9%

The Wilcoxon test yielded p = 0.000, indicating a significant effect of abdominal compresses in lowering CAS scores. This intervention is effective and safe as a nonpharmacological therapy for constipation in stroke patients.

SUGGESTIONS

For nurses, abdominal warm compresses can be used as a standard intervention in the management of nonpharmacological constipation, especially in stroke patients with limited mobility.

For hospitals, the results of this study can be used as a basis in the preparation of SOPs/Fixed Procedures for administering abdominal warm compresses to patients who experience constipation. Hospitals can provide brief training to nurses on effective and safe warm compress techniques.

Follow-up research is recommended using larger sample counts and longer intervention times, which may add to other variables such as abdominal pain levels, quality of life, or the effects of a combination of interventions (e.g. warm compresses + massage). It is recommended to conduct a quasi-experimental research design with a control group for more scientifically robust results.

REFERENCES

Abdu, H., & Seyoum, G. (2022). Sex differences in stroke risk factors, clinical profiles, and in-hospital outcomes among stroke patients admitted to the medical ward of Dessie Comprehensive Specialized Hospital, Northeast Ethiopia. Degenerative Neurological and Neuromuscular Disease, 12, 133– 144. https://doi.org/10.2147/DNND.S383564

Abdurakhman, R. N., Indragiri, S., & Setiyowati, L. N. (2020). Effect of Warm Compress Therapy with WWZ (Warm Water Zack) on Pain in Dyspepsia Patients. Journal of Health, 11(1), 77–82. https://doi.org/10.38165/jk.v11i1.201

Ardi, M., Siyamti, D., Kusumaningrum, U. A., Netti, & Aini, F. (2024). Stroke: prevention, treatment and recovery. Nuansa Fajar Cemerlang Jakarta.

Arlym, L. T., Warastuti, D., & Mutiah, S. (2023). The Effect of Giving Warm Compresses on Reducing Menstrual Pain in Adolescent Women in Rw 005 Mekarsari Cimanggis, Depok City. Malahayati Nursing Journal, 5(6),1813– 1820. https://doi.org/10.33024/mnj.v5i6.8873

Budianto, P., Prabaningtyas, H., Putra, S. E., Mirawati, Diah K., Muhammad, F., & Hafizan, M. (2021). Acute Ischemic Stroke : Basic and Clinical. University of Eleven March, January, i–123. Continence Foundation of Australia. (2024).Bristol stool chart. https://www.continence.org.au/bristol-stool-chart

Cui, J., Xie, F., Yue, H., Xie, C., Ma, J., Han, H., Fang, M., & Yao, F. (2024). Physical activity and constipation: A systematic review of cohort studies. Journal of Global Health. Advance online publication. https://doi.org/10.7189/jogh.14.04197

Daud, Izma, Heriana, N., Mira, Wulan, R. D., & Norhalipah, A. (2024). The Effect of Progressive Mobilization on Blood Pressure Reduction in Non-Hemorrhagic Stroke Patients in Izma ICU. Malahayati Health Student Journal, 4(9), 3979–3989.

Dian, W. (2020). Report of Nursing Care on Mr. H with a Medical diagnosis of CVA ICH. Journal of Chemical Information and Modeling, 53(9), 1689–1699.

Eshagi, A., Norouzadeh, R., & Jadid, M. (2024). The effect of abdominal heat therapy on constipation. Gastrointestinal Nursing, 22(3). https://doi.org/https://doi.org/10.12968/gasn.2024.22.3.160

Guyton, A. C., & Hall, J. E. (2021). Textbook of medical physiology (14th ed.). Elsevier.

Ibrahim, R., Lalenoh, D. Ch., & Laihad, M. L. (2021). Treatment of Intracerebral Hemorrhage Patients in the Intensive Care Room. E-CliniC, 9(1), 8–14. https://doi.org/10.35790/ecl.v9i1.31705

Jihan Azzahra, Bamahry, A., Pratama, A. A., Reny Purnamasari, & Rasfayanah. (2023). The Relationship between Fiber Intake and the Incidence of Constipation in Students of the Faculty of Medicine, Muslim University of Indonesia Class of 2020. Fakumi Medical Journal: Journal of Medical Students (1) 72–79. https://doi.org/10.33096/fmj.v3i1.181

Makmun, Prof. Dr. dr. D. M., Fauzi, dr. A., & Rangga, dr. R. (2023). Consensus on the Management of Constipation in Indonesia Revised 2023. THE BOTTOM.

Martono, H., & Pranaka, K. (Eds.). (2020). Geriatric Textbook (Elderly Health Sciences) (6th Edition). UI Publishing.

Masturoh, I. (2018). Health Research Methods. Center for Health Human Resources Education.

Menga, M. K., Suprapto, S., Lalla, N.N., Asmi, A.S., & Waria, L. (2023). Menage,ent of giving warm compresses to the abdominal wall with pain problems. Journal of health scientific education, 1(3), 107-113.