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Original Research/Systematic Review

THE RELATIONSHIP BETWEEN KNOWLEDGE AND PARENTS' ATTITUDE AND ANXIETY IN THE FEBRILE SEIZURES HANDLING

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ABSTRACT

Febrile seizures arise when the body temperature is above 38°C. Febrile seizures are one of the most common types of seizure conditions in children under the age of 5 years. It is the most common reason parents take their children to the emergency department. It is a form of parental anxiety level factor in handling febrile seizures. Providing information is required by parents to improve knowledge about how to deal with febrile seizures. The study aimed to analyze the relationship between knowledge and parents' attitudes and anxiety in handling febrile seizures in Ngiyono Village. The sampling method was non-probability sampling with a total sampling design in which everyone in the population becomes a sample. The research respondents were 40 respondents. The instrument used a knowledge and attitude questionnaire, DASS (Depression Anxiety Stress Scale). The results of the research test using the Rank Spearman test presented that the respondents' knowledge was in the less category with 14 respondents (35%), parents' attitudes were in the bad category with 29 respondents (72.5%), and the level of anxiety was in the severe category with 16 respondents (40%). There was a relationship between knowledge and attitudes with a p-value of 0.00 <0.05 with a correlation value of 0.657 and parents' anxiety p-value of 0.00 <0.05 with a correlation value of 0.922. The study inferred the relationship between knowledge and parents' attitudes and anxiety in febrile seizure handling in Ngiyono Village.

Keywords: Febrile Seizures, Knowledge, Attitude, Anxiety

INTRODUCTION

Febrile seizures are a type of seizure problem that often occurs in children under 5 years of age and are likely the most common reason parents take their children to emergency services (Shibeeb et al., 2019). Febrile seizures are seizures that occur in babies if their body temperature rises above 38°C and they do not have a central nervous system infection. After 5 years of age, febrile seizures rarely occur in children (Yusuf, 2014).

WHO (World Health Organization) estimates that more than 21.65 million febrile seizures occurred, of which more than 216,000 died. There are 77% of 400 children in Kuwait aged between 1 month-13 years who have a history of seizures. The frequency of febrile seizures ranges from 4-5% in Western Europe and the United States, but is significantly higher in Asia, namely 6-9%, in India 5-10%, and in Guam 10%. The incidence of febrile seizures is between 2% and 5% of children in Western Europe and the United States experiencing febrile seizures by the age of 5 years. The peak incidence of febrile seizures occurs between the ages of 12 - 18 months (Leung et al., 2018). Based on prevalence in Central Java, it is stated that the number of children aged 0 - 59 months experiencing seizures is 136,489 (5%) out of 2,729,781 children (Riskesdas, 2013). The prevalence rate of febrile seizures in Central Java province is reported to be 2% - 3% (Central Java Ministry of Health, 2013).

Febrile seizures are a type of seizure that often occurs in children. Children under 5 years of age usually experience febrile seizures. Febrile seizures are associated with fever, usually associated with a virus. A febrile seizure is a shock to the child and family. Febrile seizures can be a sign of infection that can lead to meningitis or sepsis (Williams & Wilkins, 2015).

There are several factors that cause febrile seizures such as viral infections, pneumonia, urinary tract infections, and septicemia. Febrile seizures in children have the potential to result in brain defects and even death. Children who experience febrile seizures must be closely monitored because seizures that last more than 15 minutes are very dangerous. If the child has a fever, it is necessary to lower the child's body temperature in the first 24 hours, although it is not yet known whether the child will experience seizures (Candra, 2009 in Labir K, et al., 2013).

Providing information is very necessary for parents to increase knowledge about how to deal with febrile seizures. Appropriate information on febrile seizures is very necessary for the treatment of febrile seizures and this knowledge must be obtained through formal and casual training (Purnama Dewi et al, 2019). Parents are the people closest to their children and are expected to know a lot about how to prevent and treat diseases in their children. A person's understanding of something or the information they have about it is known as knowledge (Swarjana, 2022).

Wrong understanding of parents can cause panic and mistakes in treating the disease, especially when treating febrile seizures in children. Aspiration, airway obstruction, injury, or shock due to fever, can all be caused by inappropriate treatment (Siregar & Pasaribu, 2022).

Knowledge is the understanding that a person has which can ultimately convey attitudes and behavior (Notoatmodjo, 2016). The information that mothers have is very useful in dealing with fever in children, because it can prevent the attachment of fever to children. Children's fever can be managed effectively by limiting their physical activity (Utami, 2016). A positive attitude towards treating febrile seizures at home will be influenced if parents have sufficient information about how to prevent and treat them (Notoatmodjo, 2012).

Attitude is a reaction or feeling. The way a person feels something supports or opposes an object or does not support or oppose an object (Berkowits in Azwar, 2013). Relatively persistent feelings, beliefs, and behavioral tendencies are examples of attitudes. According to Allport's definition of attitude, it is "a kind of readiness to respond to a certain goal in mind" (Azwar, 2013).

It is difficult to recognize when a febrile seizure attack occurs. Therefore, parents, especially mothers, need education about febrile seizures and the first steps to treat them. Parents who understand how to handle febrile seizures are better able to choose the best action for their children so that they can reduce anxiety in parents (Rahayu, 2015). Every time a child starts to have a fever, parents are very worried about their child. Parents feel anxious when they see their child having a febrile seizure for the first time (Najimi, 2016).

Anxiety is a highly emotional reactivity, blunted depression, or emotional response. A mother's lack of information causes an inaccurate perception of febrile seizures, which can cause anxiety. Education can help overcome this ignorance of knowledge (Rofiqoh & Isyti'aroh, 2018).

The first treatment for febrile seizures at home is to apply warm water compresses to the temples, armpits and groin, accompanied by fever-reducing medication. Children can be given lots of drinks such as milk or natural products that contain lots of water. Avoid being covered with a thick blanket because it can inhibit evaporation. If a child experiences a seizure for more than 15 minutes, immediately take the child to the hospital (Candra, 2009 in Labir K, et al., 2013).

Research conducted by Mustari (2017) at the South Ponrang Community Health Center conducted research on variables related to maternal anxiety in caring for children who were experiencing febrile seizures. The results showed that there was a correlation between knowledge of caring for mothers and anxiety with a p-value of 0.05. Research conducted by Rofiqoh (2014) found that 84.9% of mothers who had children with febrile seizures reported

experiencing severe anxiety, 15.1% reported experiencing moderate anxiety, and none reported experiencing mild anxiety. According to the journal, children's illnesses and children's conditions during febrile seizures cause family anxiety.

The results of a preliminary study in Ngiyono village found that 15 parents, 12 of them mothers and 3 fathers, said they did not know how to treat febrile seizures in children. Data was obtained from parents who had experienced febrile seizures in children who felt panicked and took the child to the nearest clinic by giving the child thick clothes and a warm compress. 12 out of 15 parents at posyandu also did not realize that high fever could cause febrile seizures in children.

The reason for this research is to show the relationship between knowledge and parental attitudes and anxiety in handling febrile seizures by using a questionnaire to see whether there is a relationship between knowledge and parental attitudes in handling febrile seizures in children and to find out the level of parental anxiety regarding the incidence of febrile seizures in children. child.

MATERIALS AND METHODS

This type of research uses quantitative research using scientific observation techniques. This research uses a descriptive analytical design using a Cross Sectional approach design. The population in this study were parents at the posyandu in Ngiyono Village with a sample of 47 respondents. This sampling technique is non-probability sampling with a total sampling design, but the total sample used were 40 respondents due to the drop out criteria. Drop Out Criteria are criteria which, if met, cause the subject not to participate in the sample in the study. The drop out criteria in this study are as follows: Respondents who did not come or were present during the meeting. All the samples have been given the questionnaire: Knowledge questionnaire, Attitude questionnaire, and DASS *(Depression Anxiety Strees Scale)* questionnaire that already have been tested about Validity and Reliability Test. This research used the Spearman Rank test

The research has been declared Ethically Aprroved by Health Research Ethics Committee of Kusuma Husada University, Surakarta with No. 744/UKH L.02/EC/VII/2023.

RESULTS

1. Parent's Knowledge

Tabel 1. Respondent characteristics based on knowledge

Knowledge	Frekuensi	Presentase (%)
Not enough	14	35
Enough	13	32.5
Good	13	32.5
Total	40	100

Based on the respondents studied regarding the knowledge presented in table 1, it shows that the majority of respondents' knowledge is in the poor category with a total of 14 respondents (35%)

2. Parent's Attitude

Tabel 2. Respondent characteristics based on parental attitudes

Keterampilan	Frekuensi	Presentase (%)
Bad	29	72.5
Good	11	27.5
Total	40	100

Based on the respondents studied regarding parental attitudes presented in table 2, it shows that the majority of respondents regarding parental attitudes were in the bad category with a total of 29 respondents (72.5%)

3. Anxiety Level

Tabel 3. Respondent characteristics based on anxiety level

Anxiety level	Frekuensi	Presentase (%)
Normal	8	20
Light	5	12.5
Currently	8	20
Heavy	16	40
So heavy	3	7.5
Total	40	100

Based on the respondents studied regarding the level of anxiety presented in table 3, it shows that most of the respondents' level of anxiety was in the severe category with a total of 16 respondents (40%)

4. The relationship between knowledge and parental attitudes in handling febrile seizures

Tabel 4. The relationship between knowledge and parental attitudes in handling febrile seizures

	Correlation coefficient (r)	**ρ Value**
The relationship between knowledge and attitudes	0.657	0.000

Based on Table 4, it shows the results of the Speraman rank correlation statistical test on the relationship between knowledge level and parents' attitudes and anxiety in handling febrile convulsions in Ngiyono village with a ρ value of 0.000 < 0.05 with a correlation coefficient of 0.657, thus showing that there is a relationship between knowledge level and parents' attitude in Management of Febrile Seizures.

5. The relationship between knowledge and parental anxiety in handling febrile seizures

Tabel 5. The relationship between knowledge and parental anxiety in handling febrile seizures

	Koefisien korelasi (r)	**ρ Value**
The relationship between knowledge and anxiety	0.922	0.000

Based on Table 5, it shows the results of the Speraman rank correlation statistical test on the relationship between knowledge level and parents' attitudes and anxiety in handling febrile convulsions with a ρ value of 0.000 < 0.05 with a correlation coefficient of 0.922, thus showing that there is a relationship between knowledge level and parents' anxiety in Management of

Febrile Seizures.

DISCUSSION

1. The relationship between knowledge and parental attitudes in handling febrile seizures

Based on the results of the spearmen rank test, it is known that the spearmen rank value is 0.657 with a probability value of 0.000 (P-value <0.05), so Ho is rejected and Ha is accepted, meaning that there is a relationship between the level of knowledge and the parents' attitude in handling febrile seizures.

Febrile seizures in children have the potential to result in brain defects and even death. Children who experience febrile seizures must be closely monitored because seizures that last more than 15 minutes are very dangerous. If the child has a fever, it is necessary to lower the child's body temperature in the first 24 hours, although it is not yet known whether the child will experience seizures (Candra, 2009 in Labir K, et al., 2013).

Wrong understanding by parents can result in panic and mistakes in handling the disease, especially the first treatment of febrile seizures in children. Aspiration, airway obstruction, injury, or shock due to fever, can all be caused by inappropriate treatment (Siregar & Pasaribu, 2022). Providing information is very necessary for parents to increase knowledge about how to deal with febrile seizures. Appropriate knowledge about febrile seizures is necessary for treating febrile seizures and this knowledge must be obtained through formal and informal education (Purnama Dewi et al, 2019).

Attitude is a reaction or response that is still closed from a person to a stimulus or object. This attitude is still a closed reaction, not an open reaction or overt behavior. Therefore, it can be concluded that when dealing with your little one who is having a febrile seizure, try to remain calm. Panicking will only make us not know what to do, which might make children's suffering worse (Fauziah, 2012).

When febrile seizures occur, immediate assistance is required, and appropriate management is necessary to prevent more severe disability caused by frequent seizures. So that first aid for treating victims is carried out immediately to prevent serious injuries and attachment to children. First aid is very important to prevent febrile seizures. However, the problem is that many mothers do not know the first treatment (Candra, 2009).

According to researchers, after conducting research, researchers found results between parents' lack of knowledge and bad parental attitudes. This is caused by parents having poor experiences, not looking for information, and not interacting with the surrounding environment. As a result, parents' knowledge about febrile seizures is lacking, which influences parents'

attitudes in treating febrile seizures in children, causing parents to panic and be confused.

2. The relationship between knowledge and parental anxiety in handling febrile seizures

Based on the results of the spearmen rank test, it is known that the spearmen rank value is 0.922 with a probability value of 0.000 (P-value <0.05), so Ho is rejected and Ha is accepted, meaning that there is a relationship between the level of knowledge and parental anxiety in handling febrile seizures.

It is difficult to recognize when a febrile seizure attack occurs. Therefore, parents, especially mothers, need education about febrile seizures and the first steps to treat them. Parents who understand how to treat febrile seizures are better able to determine the best course of action for their children, thus reducing parental anxiety (Rahayu, 2015). Every time a child starts to have a fever, parents are very worried about their child. Parents feel anxious when they see their child having a febrile seizure for the first time (Najimi, 2016).

Anxiety is excessive emotional reactivity, blunted depression, or emotional response. A mother's lack of knowledge causes inaccurate perceptions of febrile seizures, which can cause anxiety. Education can help overcome this ignorance of knowledge (Rofiqoh & Isyti'aroh, 2018).

According to researchers, after conducting research, researchers found results between parents' lack of knowledge and severe parental anxiety. This is because parents do not have good experience, do not seek information, or socialize with the surrounding environment. As a result, parents' knowledge about febrile seizures is lacking, which influences parents' anxiety in treating febrile seizures in children, causing parents to become anxious.

CONCLUSION

There was relationship between the level of knowledge and the attitude of parents in handling febrile seizures in Ngiyono village with a ρ value of 0.000 < 0.05 with a correlation coefficient of 0.657 with the categories of poor knowledge (35%) and poor attitude (72.5%). There was relationship between the level of knowledge and parental anxiety in handling febrile seizures in Ngiyono village with a ρ value of 0.000 < 0.05 with a correlation coefficient of 0.922 with the categories of poor knowledge (35%) and severe anxiety (40%). For nursing, it is necessary to further develop programs for treating febrile seizures in children by providing education or training, for example by showing educational recordings that can help expand parents' knowledge and mindset about febrile seizures and the public is expected to know how to treat febrile seizures properly.

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Original Research/Systematic Review

Finger grip therapy and slow deep breathing on peripheral oxygenation levels in hemodialysis patients

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ABSTRACT

Objective: *to determine the effect of finger grip therapy and slow deep breathing method on peripheral oxygenation levels of intra-dialysis patients.* ***Methods:*** *The research design used a Quasy-experiment with a Pre-Post Test Design with Control Group. Respondents were CKD patients undergoing hemodialysis. The total of 58 respondents who meet the inclusion criteria and willing to be the respondents were divided into the intervention group and the control group. Intervention group received finger grip therapy and slow deep breathing for 10-15 minutes during the dialysis. Observation of oxygen saturation conducted four times every hour.* ***Results:*** *8.6% of respondents were male, 91.4% were adult, half of them were within 2 years getting hemodialysis, and all of respondents undergoing HD twice a week. The mean of oxygen saturation between control and intervention were 97.8%, 97.3% on pre-test and 97.9%, 98.4% on post-test, respectively. There were significant different of oxygen saturation between groups (p<0.05).* ***Conclusion:*** *The combination of finger grip therapy and slow deep breathing can increase peripheral oxygenation level during intradialysis in CKD patients.*

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Finger grip therapy, Hemodialysis, Slow deep breathing

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INTRODUCTION

Chronic Kidney Disease (CKD) is the biggest cause of death in 21 countries, and Indonesia is one of them. The prevalence of CKD reaches > 10% of the world's population, which is estimated at around 843.6 million people (Kovesdy, 2022). In Asia, the incidence of CKD reaches 434.3 million of the total Asian population, with the highest incidence in China and India (Liyanage et al., 2022). The average incidence of CKD in Indonesia is 7.5%, lower than the global average (Suriyong et al., 2022). Data from Basic Health Research show that the incidence of CKD in Indonesia has reached 499,800 people (2%), with the number of CKD patients undergoing HD every year increasing by 10%. The incidence of CKD in Central Java in people aged more than 15 years is 0.42% and those undergoing hemodialysis therapy reach 16% of the total patients with kidney failure in Central Java. CKD sufferers in the Soloraya region continue to increase from 0.2% in 2013 to 0.38% in 2018 (Riskesdas, 2018). Hemodialysis therapy (HD) is used as an effective treatment and is widely used as a treatment for CKD patients, but it is also an uncomfortable therapy for patients because it can cause complications and complaints. A study conducted by Lenggogeni (2020) mentioned complications and complaints that were often experienced by hemodialysis patients, namely fatigue (87.5%), pruritus (93.8%), nausea, vomiting (56.3%), pain stabbing AV fistula (86.7%), muscle cramps (86.7%) and sleep disturbances (86.7%) (Lenggogeni & Malini, 2020). In the narrative review of the American Journal of Kidney Disease, the incidence of intradialysis hypotension (HID) was 76%, fatigue 82%, cramps 76%, post-dialysis dizziness 63%, headaches 54%, pruritus 52% and back pain 51% (Morfin et al., 2016).

The incidence of hemodialysis complications is influenced by changes in the patient's hemodynamics during the dialysis process which can cause an imbalance of hemoglobin and result in decreased levels of oxyhemoglobin in the blood and perfusion problems (Nekada & Judha, 2017). If the amount of hemoglobin in the body is insufficient, peripheral oxygenation levels can decrease and cause oxygen saturation to decrease (Azizah, 2015).

Decreased oxygen saturation (SPO2) causes the need for oxygen supply in the blood to be unfulfilled resulting in peripheral vascular vasoconstriction and increased heart

rhythm causing patient fatigue and can increase the risk of shock. A predictive study by Suparti (2020) states that patients with abnormal SPO2 values and pulse experience complications more often than patients with normal SPO2 and pulse values. So oxygen saturation can be an alternative for monitoring and predicting the occurrence of intradialytic complications (Suparti & Mahmuda, 2020).

Complementary therapy as an effort to increase oxygen saturation can be done with relaxation techniques. In previous studies, the relaxation technique of slow deep breathing has been shown to affect increasing oxygen saturation (Yunica Astriani et al., 2021). Slow deep breathing causes an increase in oxygen levels in the blood and balances oxygen levels in the brain. Slow deep breathing can also stimulate the autonomic nerves to increase the work of the parasympathetic nerves and decrease the work of the sympathetic nerves resulting in vasodilation of blood vessels and decreased heart rate (Sari Utami Muchtar et al., 2022). Slow deep breathing has also been shown to be effective in reducing fatigue in hemodialysis patients (Pertiwi, 2020).

Based on research conducted by Surahmawati (2021) finger-holding therapy focuses on energy in the body by managing emotions and perceiving relaxed stimuli so that a relaxation response appears and blood circulation in the body becomes smooth (Surahmawati et al., 2021). Supported by research by Setyo Upoyo and Taufik (2019), which combines finger grip therapy with slow deep breathing. This combination therapy helps manage energy and emotions in the body with deep breaths, thereby helping to reduce heart rate and improve blood circulation to increase oxygen supply at the peripheral level (Setyo Upoyo & Taufik, 2019).

MATERIALS AND METHOD

Research design

This research was Quasy-experiment with Pre-Post Test Design with Control Group.

Sample

Total 58 respondents recruited with non-probability sampling with the inclusion criteria: willing to be the respondent, undergoing hemodialysis more than 1 year, and in a good clinical condition. The exclusion criteria were respondents with oxygen therapy.

Intervention

The intervention was carried out by giving finger grip therapy and slow deep breathing to the intervention group for 10-15 minutes. Intervention is given in the first hour during hemodialysis. Here are the intervention steps:

1. Position the body comfortably
2. Think positive
3. Place your finger on your abdomen
4. Take a deep breath from the nose and exhale it from the mouth slowly to relax all muscles, while closing your eyes
5. Hold fingers starting from the thumb for 2-3 minutes
6. Repeat step 2-5 for 10-15 minutes

Data collecting

Characteristic of respondents was collected by self report from respondents. Characteristic respondents data includes age, gender, history of hemodialysis, and frequency of hemodialysis. Peripheral oxygen level measured by calibrated oximeter.

Data analysis

Analytical data using univariate and bivariate analysis. Univariate analysis conducted for demographic data and bivariate analysis using Mann-Whitney due to abnormal distribution data

Ethical clearance

This research was conducted after obtaining approval from the Health Research Ethics Committee with number 1,660/XII/HREC/2022

RESULTS

Characteristic of respondents were obtained and showed in table 1. It was found that 58.6% (n=34) respondents were male, 91.4% (53) were adults, half of them (n=29) were having 1-2 years of HD history, and all of respondents (n=58) have twice a week of HD frequency.

Table 1. Characteristics of respondents

:acteristics of spondents	**quency**	**recentage (%)**
ler		

:acteristics of spondents	**quency**	**recentage (%)**
	34	58.6
ıan	24	41.4
y.o	53	91.4
y.o	5	8.6
ıry of HD		
ear	29	50
ear	20	34.5
ar	9	15.5
uency lived HD		
e a week		

Additionally, Respondents have concomitant diseases which list as Hypertension (n=34; 49.3%), Diabetes Mellitus (n=16; 23.2%), uric acid (n=6; 8.7%), and none (n=13, 18.8%). Only 20% (n = 13) of respondents were on a low-sodium diet, approximately 78% (n = 45) did not consume alcohol, only 36.2% (n = 21) smoked, and 52% (n = 36) with normal blood pressure, 26% and 12% remained pre-hypertension and hypertension, respectively.

Baseline data showed an average oxygen saturation were 98% and 97% for control and intervention groups, respectively. The average post-test data of the control and intervention groups were 98% and 98%, respectively. The different test results of the two groups can be seen in table 2.

Table 2. Differences of oxygen saturation between control and intervention groups after intervention

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rol	)	)*
vention	)0	

*Mann-Whitney

DISCUSSION

The result showed that there was a significant difference in the increase in oxygen saturation between the intervention group and the control group. This means that finger grip therapy and slow deep breathing affects on peripheral oxygenation levels in intradialytic patients compared to the group that was not given intervention. However, both groups had oxygen saturation values before and after treatment which were in the normal range (> 95%) and there was an increase in oxygen saturation levels. The average difference in the pretest and posttest increase in oxygen saturation in the intervention group was 1.13% (> 1%) while in the control group, it was 0.11% (<1%).

In several studies, there were several variations of the cut-off value to determine and predict the occurrence of hypoxemia. In previous studies, the cut-off value of oxygen saturation was by the AUC, which was 0.99%. Then in another study by Rory et al (2021) concerning oxygen index (OI) and oxygen saturation index (OSI) as predictors of mortality in acute respiratory distress syndrome (ARDS) using oxygen saturation as a measure of OSI, the highest AUC cut-off value was obtained, namely 0.935%. According to the kappa agreement, the oxygen saturation index accuracy value is 0.96%. Based on this description, an increase or decrease in oxygen saturation levels > 1% can be said to be significant (Rory et al., 2021).

Physiologically, there were differences in response between the intervention group and the control group after being given finger-holding therapy and slow deep breathing. In the intervention group, there was a more significant increase in oxygen saturation levels

(> 1%) with patients clinically stating that they felt more relaxed and comfortable during hemodialysis. Patients who were given finger grip therapy and slow deep breathing had better peripheral perfusion than the control group. Finger holding therapy and slow deep breathing help reduce body tension and relax the body (Nita Silfia & Made Arlina, 2021). A relaxed state of the body with slow breathing stimulates the autonomic nerves to decrease the work of the sympathetic nerves and increase the work of the parasympathetic nerves so that it can cause a vasodilation effect on blood vessels so that the flow in the body is smooth and breathing is regular to achieve effective ventilation and oxygen levels in the tissues increase (Sari Utami Muchtar et al., 2022).

Whereas in the control group the increase in oxygen saturation was considered insignificant (<1%) clinically, some patients stated feeling tired, nauseous and dizzy. In the control group who did not perform finger-holding therapy and slow deep breathing while undergoing hemodialysis when oxygen levels in the blood did not reach the peripheral level adequately, hemoglobin deoxygenation would occur which caused patients to easily feel tired, nauseous and dizzy. However, in some cases, even though a person is unable to supply oxygen, they still have normal oxygen saturation values (Sucipto et al., 2019).

In line with research by Pertiwi (2020), which provided slow deep breathing intervention in patients undergoing HD, the results showed that patients who were given slow deep breathing therapy showed complaints of feeling tired, which decreased from moderate to mild. In another study, the level of nausea and vomiting in patients undergoing hemodialysis was significantly related to oxygen saturation. 98.2% of respondents with normal oxygen saturation did not experience nausea and vomiting while undergoing hemodialysis. Patients undergoing hemodialysis therapy experience nausea and vomiting affected by low oxygenation levels (Nekada & Judha, 2017).

In a study by Widodo & Trisetya (2022) applying deep breathing therapy and holding fingers as a relaxation therapy to reduce pain in post-herniorrhaphy patients, the results obtained after administering therapy were that the patient felt relaxed and reduced pain. Relaxation therapy helps the body increase alveolar ventilation and prevent pulmonary atelectasis so that it can increase oxygen saturation levels and stimulate the brain to have a relaxing effect on the body (Widodo & Trisetya, 2022).

In an experimental study at the University Hospital of Alexandria, Egypt, which was

conducted on patients undergoing HD with deep breathing exercises, the results showed that patients who underwent deep breathing exercises showed a decreased level of fatigue (A. Hamed & Mohamed Abdel Aziz, 2020). Another study conducted on HD patients at Quesna Hospital in Cairo also showed that the group that underwent deep breathing exercises had a better reduction in fatigue levels than the group that did not undergo deep breathing exercises (Moussa et al., 2022).

Physiologically breathing exercises stimulate the parasympathetic nervous system to maximize lung expansion and increase oxygen supply and remove excess carbon dioxide in the lungs so that it can reduce the effects of fatigue in hemodialysis patients (Suprihatin et al, 2022).

CONCLUSION

In conclusion, finger grip therapy and slow deep breathing can increase peripheral oxygenation levels among patients undergoing hemodialysis

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Original Research/Systematic Review

Treatment of Foot Wounds for Diabetes Sufferers during the Covid-19 Pandemic Using Modern Dressing; Differences in Age and Gender

ABSTRACT

Background. During the Covid 19 pandemic, diabetes is a comorbid disease that influences the management of diabetic foot wound care. There are changes in the blood vessel endothelial tissue, which affect the wound healing process. Therefore, it is expected that wounds will take longer to heal than foot wounds in people with diabetes who are unexposed to Covid 19. **Purpose:** To determine the differences in diabetic foot wound care using modern bandages based on age and gender factors and history of exposure to Covid 19. **Method:** The research model used a quasi-experimental design with a pre and post-test without a control group design, namely comparing the condition of the wounds after treatment on respondents as a sample of 60 people. The samples are conducted by dividing them into 2, including 26 respondents exposed to Covid 19 and 34 respondents not exposed. Furthermore, data analysis was conducted using the Chi-Square test. **Results:** There was no difference in the post-treatment wound condition between patients who had and had not been exposed to Covid 19 based on age (p. value 0.086 > 0.05). There were differences in wound conditions after treatment between patients who had and had not previously been exposed to Covid 19 based on gender (p. value 0.032 < 0.05). **Conclusion**: There are differences in the condition of diabetic foot wounds after treatment between those exposed and those not exposed to Covid 19 based on gender. Meanwhile, in terms of age, there is no difference.

Key Words: Diabetic foot wounds, Age, Gender, Covid 19

INTRODUCTION

Lifestyle changes are one of the causes of the increase in diabetes mellitus (DM), which the WHO predicted will reach 61% prevalence by 2030. It is also predicted to become a pandemic in the 21st century, including in Indonesia (WHO, 2016).

In 2021, the prevalence of diabetes was 10.5%; in 2045, it will be 12.2%. The International Diabetes Federation (IDF) reported that the prevalence rate of 10.5% in 2021 could be 12.2%. When the prevalence rate is broken down, it is known that in rural areas, it is 8.3%, while in urban areas, it is 12.1% higher (Sun et al., 2022).

There are so many complications of diabetes, and it requires long-term care and regular monitoring to manage it. One of the most commonly experienced complications is diabetic foot wounds. The condition of foot wounds will worsen if patients do not self-manage, such as controlling blood glucose, caring for their feet, taking medication, and dieting. Diabetic foot wounds require special and routine care using current foot wound care techniques, such as modern dressings with moist methods (Ose M.I, Utami.P.Y, Damayanti. A, 2018).

The use of modern dressings provides conditions for maintaining the isolation of the wound environment which remains moist. It is hoped that this technique can help heal diabetic foot wounds so that further complications do not occur which can lead to amputation.

Modern dressings maintain the isolation of the wound environment to keep it moist. Hopefully, this technique will help heal diabetic foot wounds and prevent further complications that could lead to amputation.

However, modern dressings have limitations, and the results still need to be optimal. Therefore, a number of issues influence the results of wound care procedures. Furthermore, it is also necessary to study whether the COVID-19 pandemic also affects the results of treatment for diabetic foot wound care, as it is known that the condition of diabetic patients' foot wounds exposed to Covid 19 can be different from those who are not exposed to Covid 19. Therefore, diabetic foot wound care requires special attention (Aldana, P.C., Khachemoune, 2020).

Materials and Methods

This research used a quasi-experiment with a pre and post-test without a control group

design, conducted from February 2022 to November 2022 in five RUMAT Clinics in two provinces, Central Java and the Special Region of Yogyakarta, with three and two units for each. There are Surakarta, Karang Anyar, and Sukoharjo Units in Central Java and Sleman and Bantul Units in the Special Region of Yogyakarta.

Samples were taken from up to 60 people with non-infectious diabetic foot wounds. The wound conditions were then assessed and treated three times using the modern dressing method. The wound condition was then assessed again. Analysis of differences in wound condition after treatment between those who were exposed and those who were not exposed to Covid 19 based on age and gender was done using Chi-Square analysis to see if there were any differences.

RESULTS

Table 1. Distribution of Respondent Characteristics Based on Gender and Age

Exposed Covid 19	Age												Total
	Adults				Pre-Elderly				Elderly				
	Jenis Kelamin												
	Men		Woman		Men		Woman		Men		Woman		
	(f)	(%)	(f)	(%)	(f)	(%)	(f)	(%)	(f)	(%)	(f)	(%)	
Yes	2	67	1	50	5	33	7	47	6	43	5	45	26
No	1	33	1	50	10	67	8	53	8	57	6	55	34
Total	3	100	2	100	15	100	15	100	14	100	11	100	60

Based on Table 1, it can be seen that the gender of the respondents was equally female and male. The highest age group was in the pre-elderly group, while fewer respondents were exposed to Covid 19 than those not exposed to Covid 19.

Table 2. Distribution of Wound Colors of Respondents Exposed And not exposed to Covid 19 after being treated.

Exposed Covid 19	**Wound Condition**							
	Black		Yellow		Red		Total	
	(f)	(%)	(f)	(%)	(f)	(%)	(f)	(%)
Yes	0	0	9	65	17	37	26	44
No	0	0	5	35	29	63	34	56

Total	0	0	14	100	46	100	60	100

Based on Table 2, it can be seen that no black wounds were found. Only the yellow and red wounds of respondents who were exposed and not exposed to Covid 19 after receiving wound care using modern dressings such as hydrocolloid moist technique (Moist) can be seen, and no more were found.

Table 3. Comparison of Wound Conditions of Respondents Who Were Not Exposed to Covid 19 Post-Treatment Wounds Based on Gender

Wound Condition	Gender				Total		p. Value
	Men		Woman				
	(f)	(%)	(f)	(%)	(f)	(%)	
Black	0	0	0	0	0	100	
Yellow	3	60	2	40	5	100	0,082
Red	15	52	14	48	29	100	
Total	18	53	16	47	34	100	

Based on Table 3, it can be seen that there is no significant difference in the condition of the wounds of respondents who were exposed to Covid 19 before and after wound treatment (p value = 0.082 > 0.05). Thus, it can be concluded that the Null hypothesis, which reads: There is no difference in the condition of foot wounds in diabetics who were not exposed to Covid 19 after receiving wound care based on gender, is accepted, and the alternative hypothesis, which reads: There is a difference in the condition of foot wounds in diabetics who were not exposed to Covid 19 after receiving gender-based wound treatment is denied.

Table 4. Comparison of Wound Conditions of Respondents Exposed to Covid 19 After Wound Treatment Based on Gender

Wound Condition	Gender				Total		p. Value
	Men		Woman				
	(f)	(%)	(f)	(%)	(f)	(%)	
Black	0	0	0	0	0	100	
Yellow	3	34	6	66	9	100	0,032
Red	14	82	3	18	17	100	
Total	17	65	9	35	26	100	

Based on Table 4, it can be seen that there is a significant difference in the condition of the wounds of respondents who were exposed to Covid 19 before and after wound treatment (p value = 0.032 <0.05). Thus, it can be concluded that the Null hypothesis, which reads: There is no difference in the condition of foot wounds in diabetics who were not exposed to Covid

19 after receiving wound treatment based on gender, is rejected, and the alternative hypothesis, which reads: There is a difference in the condition of foot wounds in diabetics who were not exposed to Covid 19 after receiving Wound treatment based on gender is accepted.

Table 5. Comparison of Wound Conditions of Respondents Exposed to Covid 19 After Wound Treatment Based on Age

Wound Condition	Age						Total		p. Value
	Adults		Pre-elderly		Elderly				
	(f)	(%)	(f)	(%)	(f)	(%)	(f)	(%)	
Black	0	0	0	0	0	0	0	100	
Yellow	1	7	6	43	7	50	14	100	0,039
Red	1	5	12	60	7	35	20	100	
Total	2	6	18	53	14	41	34	100	

Based on Table 5, it can be seen that there is a significant difference in the condition of the wounds of respondents who were exposed to Covid 19 before and after receiving wound treatment (p value = 0.039 < 0.05). So it can be concluded that the Null hypothesis, which reads: There is no difference in the condition of foot wounds of diabetics exposed to Covid 19 after receiving wound treatment based on age, is rejected, and the alternative hypothesis, which reads: There is a difference in the condition of foot wounds of diabetics exposed to Covid 19 after receiving wound treatment based on age accepted.

Table 6. Comparison of Wound Conditions of Respondents Who Were Not Exposed to Covid 19 After Wound Treatment Based on Age

Wound Condition	Age						Total		p. Value
	Adults		Pre-elderly		Elderly				
	(f)	(%)	(f)	(%)	(f)	(%)	(f)	(%)	
Black	0	0	0	0	0	0	100	100	
Yellow	1	5	10	53	8	42	19	100	0,048
Red	1	7	8	53	6	40	15	100	
Total	2	6	18	53	14	45	34	100	

Based on Table 6, it can be seen that there is a significant difference in the condition of the wounds of respondents who were not exposed to Covid 19 before and after receiving wound treatment (p value = 0.048 < 0.05). It can be concluded that the Null hypothesis, which reads: There is no difference in the condition of the foot wounds of diabetics who were not exposed to Covid 19 after receiving wound treatment based on age, is rejected, and the alternative hypothesis, which reads: There is a difference in the condition of the foot wounds of diabetics who were not exposed to Covid 19 after receiving Age-based wound treatment is accepted.

Table 7. Comparison of Wound Conditions of Respondents Between Those Exposed and Not Exposed to Covid 19 After Wound Treatment

Exposed Covid 19	Wound Condition						Total		p. Value
	Black		Yellow		Red				
	(f)	(%)	(f)	(%)	(f)	(%)	(f)	(%)	
Yes	0	0	6	23	20	77	26	100	0,045
No	0	0	12	35	22	65	34	100	
Total	0	0	18	30	42	70	60	100	

Based on Table 7, it can be seen that there is a significant difference in the condition of respondents' wounds between those who were exposed and those who were not exposed to Covid 19 after receiving wound treatment (p value = 0.045 < 0.05). It can be concluded that the Null hypothesis, which reads: There is no difference in the condition of the foot wounds of Diabetics between those exposed and those not exposed to Covid 19 after wound treatment, is rejected, and the alternative hypothesis, which reads: There is a difference in the condition of the foot wounds of Diabetics between those exposed and those who are not exposed to Covid 19 after receiving wound treatment.

DISCUSSION

Currently, diabetic foot wounds are a chronic disease that must be taken more seriously because they result in life-threatening complications, reduce life expectancy, and are expensive. Reports from the IDF (International Diabetes Foundation) state that the global prevalence of diabetes has reached 9% (463 million adults) in 2019. This increasing prevalence is attributed to increasing aging populations and diabetes risk factors such as obesity (Hong Suna et al., 2022).

Age means that aging affects wound healing, as is often the case with older people, so the potential for wound healing will change. This even occurs in uninjured elderly skin, the morphology of which changes with age. Impaired wound healing is caused by changes in the epidermis, dermis, and subcutaneous tissue, which experience atrophy (Wicke et al., A, 2009)

Other studies have found that increasing age increases the risk of developing diabetic foot ulcers and the wound healing process takes longer as age increases. It is explained that there is decreased elasticity and reduced collagen regeneration due to a decrease in cell metabolism (Setyobudi. E, 2020)

Other researchers have a different opinion, namely that the age factor is not related to the length of healing time for diabetic foot wounds (Pujiati, 2019). This is possible considering that there are many influencing factors, such as blood sugar control, adherence to taking medication and a long history of suffering from diabetes, which can cause wound healing to take longer.

Research on the healing of diabetic foot wounds compared between men and women has been carried out and resulted in men healing longer. The wounds are more profound and twice as often as men experience infection (Vanherwegen.S, Lauwers.P, Lavens.A, Doggen.K, Dirinck.E, 2023). However, women have a higher risk of suffering from diabetes than men. The tendency to have more diabetes causes a quantitative increase in the incidence of diabetic ulcers in diabetes mellitus sufferers in women to be higher than in men (Detty et al., B, 2020)

The outbreak of COVID-19 is disrupting the treatment and management of diabetes patients, including treating diabetic foot wounds. Therefore, the health service system must be developed, such as combining services in institutions with existing technology to facilitate the care and follow-up of patients with diabetic foot ulcers in

the future to continue producing the best (Rubin, 2023). As the results of this research show, there are differences in the condition of diabetic foot wounds after receiving treatment between those exposed and those not exposed to Covid 19. This condition needs to be appropriately addressed to optimize the nursing services provided can be optimized.

The results of this study support other research which provides an opportunity to study the effects of COVID-19, especially on diabetic foot wounds such as new ulceration, death and amputation. It can be done by monitoring patients with COVID-19 who previously had infected foot wounds and then studying whether the previous infection increases the risk of diabetic foot wounds, amputation or death. (Roberto Anichini, MD, Claudia Cosentino, MD, Nikolaos Papanas, MD, 2022).

Because it is known from this research that the condition of diabetic foot ulcers exposed to Covid 19 is different from those not exposed to Covid 19 after receiving treatment, it is best to treat diabetic foot ulcers using a standard of care that involves four principles: (1) pressure reduction, (2) debridement, (3) infection management, and (4) revascularization if indicated (Aldana, P.C., Khachemoune, 2020).

The results of research on treating diabetic foot wounds using modern dressing techniques are shown to be more effective in healing wounds by accelerating the granulation of various types of dressings used according to the condition of the wound (Dimantika et al., 2020). The same thing has also been revealed if modern wound care using the moist wound healing method was influential in the healing process of diabetic ulcers. (Angrian. S,. Hariani,. Dwianti., 2019). It is also known that modern bandages (hydrocolloids) are effective in healing diabetic wounds that are often suffered by type II DM sufferers as a safe and effective way of healing (Adriani, 2016).

The Covid 19 pandemic has impacted wound healing, so currently, wound care measures need to pay attention to other wound care principles. The pandemic has had a negative impact on vascular wounds on the skin of people with diabetes, with increased severity and risk of death compared to pre-pandemic conditions (Sallustro M, 2022). In addition, it has been proven that modern wound dressings influence the healing process of diabetes mellitus wounds. So, the average wound healing process before and after using modern dressings decreases (Sitohang.S, 2019)

The results of this study reveal that there are differences in the condition of diabetic foot wounds between sufferers who are exposed and those who are not exposed to COVID-19, are supported by studies that show that there is a relationship between endothelial cell dysfunction in people with type 2 diabetes and COVID-19 (Hayden, 2020).

In the future, it is hoped that services can be developed by conducting online consultations (telemedicine) to assess the client's condition regarding complaints, then proceed with a triage process to prioritize treatment needs and screening services to check for symptoms of COVID-19 before providing diabetic foot wound care services. (Hermawati, Tiranda, Y., 2021)

CONCLUSION

There are differences in the condition of foot wounds of DM patients between those exposed to Covid 19 and those not exposed to Covid 19 after wound treatment. For this reason, it is recommended to review the patient's COVID-19 record before wound treatment in diabetic patients.

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Original Research/Systematic Review

MIRROR THERAPY IMPROVES 1 POINT OF MUSCLE STRENGTH

ABSTRACT

Objective: To analyze the effect of mirror therapy on increasing muscle strength.

Method: This research method uses a descriptive case report-based design with a comprehensive nursing care approach. The case study subjects consisted of 2 respondents Mr. S (62 years) and Mrs. A (70 years) with a medical diagnosis of recurrent infarction stroke and non-hemorrhagic recurrent stroke who experienced problems fulfilling activity needs. The research was conducted in one of the hospitals in Surakarta in January-February 2023

Results: Mirror therapy carried out for 3 x 30 minutes increased 1 point of muscle strength in Mr. S muscle strengths 2 to 3 and in Mrs. A muscle strengths 3 to 4.

Conclusion: Mirror therapy is effective in increasing muscle strength in the affected limbs of stroke patients and can be an SOP or an alternative intervention that can be applied in the field of Nursing.

Keywords: Mirror Therapy, Muscle Strength, Stroke

INTRODUCTION

Activity limitation is the main factor that causes high suicides in stroke patients Cognitive impairment and limitations in carrying out daily activities cause stroke patients to experience depression and increase suicide cases in stroke patients [1]. Activity limitations occur due to motor impairment which can be caused by hemorrhagic stroke and non-hemorrhagic stroke, this condition occurs when there is a loss of blood flow due to blockage or rupture of cerebral blood vessels that carry nutrients and oxygen to a region of the brain resulting in nerve damage and neurological deficits [2].

Globally the incidence of stroke reaches more than 12.2 million new cases annually, with more than 143 million normal lives lost due to death and disability [3]. Based on Basic Health Research in 2018, the prevalence of stroke in Indonesia is 10.9% with 713,783 cases annually [4]. In Surakarta in 2021 stroke is the fifth cause of death reaching 208 people [5]. Based on the medical record of RSUD Dr. Moewardi in 2022 the number of strokes will reach 1700 people.

Activity limitations have an impact on reducing the ability of daily activities and the patient's quality of life. In stroke patients, motor impairment results in 80% of patients experiencing permanent disability with 30% experiencing dependence. Motor impairment in stroke patients usually affects the control of facial, arm, and leg muscle movements on one side of the body [6]. Therefore, most of the focus of rehabilitation in stroke patients is on restoring movement disorders and related functions.

Motor disturbances can be caused by ischemic or hemorrhagic injury to the motor cortex. The motor cortex is responsible for coordinating movements including those of the hands, and feet, controlling facial expressions and swallowing movements. Signals from the primary motor cortex cross the midline of the body to activate the muscles of the opposite side of the body this means that movement of that side of the body is controlled by the opposite side of the primary motor cortex. So that if there is a disturbance in the motor cortex it will affect the individual's ability to meet the needs of daily activities [7].

Efforts according to nursing care standards are carried out in preventing decreased muscle strength in stroke patients in addition to medication or drug therapy are physiotherapy such as aerobic exercise, range of motion (ROM) exercises, coordination exercises, and strengthening exercises [8]. During the first three a patient is diagnosed with a stroke, the brain enters a state of high plasticity. At this stage, therapy will have a more

visible impact, and the patient can progress more quickly. Therefore, in this phase it is very important to start providing appropriate intervention and rehabilitation options to improve sensory-motor functional status in stroke patients so that there is no decrease in muscle strength which will cause paralysis [7].

In addition to ROM rehabilitation therapy which is often done, there is another alternative therapy, namely mirror therapy. Mirror therapy is a rehabilitation therapy using mirror media where visual reflexes in normal limbs give the illusion of movement in impaired limbs [9]. These alternative therapies can be applied and combined to improve sensory motor function, and are non-invasive, and economical. Mirror therapy provides visual feedback that can activate mirror neurons which are necessary for the brain in the process of neuroplasticity [7]. Neuroplasticity is the ability of the brain to heal and repair itself after neurological injury [10]. Therefore, mirror therapy has the potential to improve the functional condition of patients, but there is no research that explains the exact effect of mirror therapy on muscle strength so researchers analyze the effect of mirror therapy on increasing muscle strength.

MATERIALS AND METHODS

Case Description

This research method uses a descriptive case report-based design with a comprehensive nursing care approach in two stroke patients who experience impaired fulfillment of activity needs. The case study subjects consisted of 2 respondents Mr. S (62 years) and Mrs. A (70 years) with a medical diagnosis of recurrent infarction stroke and non-hemorrhagic recurrent stroke who experienced problems fulfilling activity needs. Where these patients are given interventions according to nursing care standards and researchers add mirror therapy actions to restore the patient's functional status.

The researcher determined the inclusion criteria of composmentis awareness, vital signs in stable condition, patients with hemorrhagic and non-hemorrhagic stroke, adult-elderly, male/female, stroke patients with hemiparesis, stroke patients with a minimum muscle strength value of 2 and maximum 3, stroke patients with cognitive abilities including attention, memory ability and concentration. Exclusion criteria Patients with severe cognitive deficits include impaired memory, impaired ability to think and concentrate, patients with muscle strength 0, and stroke patients with impaired vision.

Measurement

Measurement of muscle strength using manual muscle (MMT). Mr. S obtained the results of the patient saying he was unable to straighten his arms and move his fingers. During the study, the patient was able to move his left hand but the movement was weak and unable to fight gravity, and muscle strength 2, the patient was able to move his left leg but was unable to resist the examiner's maximum resistance muscle strength 4. In Mrs. A, the results showed that the patient said that his right hand felt heavy and difficult to move. During the assessment, the patient was able to fight gravity but could not resist moderate resistance. The examiner of muscle strength 3. The patient was able to lift and move his right leg but was unable to resist the maximum resistance. The examiner of muscle strength was 4.

Procedure

The researcher obtained ethical permission from the Ethics Committee of RSUD Dr. Moewardi with the issuance of ethical clearance Number: 1.591 /XII / HREC / 2022 on December 20, 2022. After the issuance of ethical clearance, the researchers submitted it to the education and training department of RSUD Dr. Moewardi then issued a research permit Number: 045/38/2022 on January 3, 2023. The researcher continued the research process by taking cases in the Anggrek 2 ward of RSUD Dr. Moewardi. This study was conducted in January-February 2023 with the consent of the patient and family followed by handing out the Informed Consent sheet.

The research was carried out according to nursing care standards carried out for 3 x 24 hours with mirror therapy for 3 x 30 minutes. Mirror Therapy consists of 2 sessions with an assessment of muscle strength before and after the procedure. During a mirror therapy session, a mirror is placed in the patient's midsagittal plane, so that it reflects the non-paretic side as if it were the affected side. With this method, movement of the non-paretic limb creates the illusion of normal movement of the paretic limb [9]. Patients are encouraged to look at the reflection of the normal limb and imagine as if it were the affected limb. Patients are not allowed to see the debilitated limb behind a mirror[11]. Mirror therapy provides visual feedback that can activate mirror neurons repeatedly in the affected part, so that the brain will get feedback that triggers neuroplasticity processes and improves overall recovery [12].

RESULTS

Mr. S with a medical diagnosis of Recurrent Stroke Infarction and Ny. A with a medical diagnosis of recurrent infarction stroke and non-hemorrhagic. Both patients were given actions according to standard nursing care for 3 x 24 hours and mirror therapy for 3 x 30 minutes with the results of the two patients experiencing a significant increase in muscle strength, namely by 1 point as presented in Table 1.1 in Mr. S left upper extremity muscle strength 2 to 3 and in Mrs. A right power right upper extremity muscle strength 3 to 4.

Table 1 : Comparison

Indicators	No	Pre	Post	Intervention
Musculoskeletal System	1.	Patient Mr. S Data obtained from Tn.S said that his left hand felt weak and stiff and was difficult to move. - The patient's hand appears rigidly flexed - Fingers gripping strong and hard to straighten - The patient is only able to move the hand - Patient unable to fight gravity, muscle strength 2.	Patient Mr. S after the patient's action, the patient says his hand is getting better - The patient can straighten the arm independently. - The patient can raise and lower the hand against gravity. - The patient can flex and extend the arm. - The patient can flex and extend the fingers. - Patient is unable to fight moderate resistance, muscle strength 3.	Mirror therapy was carried out for 3 x 30 minutes consisting of 2 sessions, each session lasting 15 minutes.
	2.	Patient Mrs. A The data obtained by Mrs. A said his right hand was still weak, heavy, and difficult to move. - The patient seemed difficult to move his right hand. - His right hand looked limp. - The patient can lift. hands but weak muscle strength. - The patient is unable to fight moderate	Patient Mrs. A After the procedure, the patient said his hand felt lighter - The patient seemed to move his hand more easily. - The patient's right hand appears stronger. - The patient can lift the arm fully against gravity. - The patient has not been able to fight the maximum resistance of muscle strength 4.	

	resistance of muscle strength 3	

DISCUSSION

This study aimed to analyze the effect of mirror therapy on increasing muscle strength in stroke patients through a case report-based nursing care approach with standard nursing care measures for 3 x 24 hours and mirror therapy measures for 3 x 30 minutes.

The most common long-term disability in stroke patients is hemiparesis. Hemiparesis affects more than 70% of patients, and loss of muscle strength is more common in the arms than the legs. Arm weakness causes significant limitations in activities of daily living and can also negatively impact self-care, autonomy, and independence [13]. This condition can last for months or even years, affecting the patient's function. Hemiparesis in stroke patients is closely related to neuroplasticity and reorganization of neural pathways during recovery from stroke [14].

After experiencing a stroke attack, patients with acute stroke have less than 40 minutes of physical activity in a day during the hospitalization period. In this condition, the time spent in bed is more than 50%. In patients who are bedridden for a long period of time, the decline in muscle strength occurs earlier than the loss of muscle mass, low activity intensity leads to a decrease in muscle strength, and muscle weakness further reduces the ability to move, so this condition forms a vicious circle. Thus, stroke-induced damage and decreased mobility result in decreased muscle mass in paresis muscles and, to a lesser extent, in non-pressed muscles [15].

The mechanical properties of the muscle play an integral role in the form of commands from the nervous system to activate the muscle and will produce various levels of force depending on the state of the muscle. The effect of muscle length and shortening speed on force production is characterized in terms of the length-tension relationship and force-velocity relationship of muscle. The length-tension relationship states that the muscle produces less force in the shortened position than in the lengthened position. The force-velocity relationship reveals that the faster the shortening contraction, the lower the force produced, whereas the impact of increasing the speed of the lengthening contraction on force generation is relatively small [14]. This is what causes the patient's condition to worsen if they do not get proper rehabilitation during the recovery period after a stroke.

Traditionally, motor disability in patients with neurological diseases is considered solely due to the brain injury itself. In the rehabilitation process muscles are rarely the target in the rehabilitation approach of central nervous system diseases and recovery is only focused on central motor control rather than peripheral muscles with the central approach, which exploits the plastic capacity of nerve cells to best restore motor control. In this paradigm, muscle tissue is often neglected [16]. In the neurorehabilitation process, strength training is very necessary because exercise can prevent nerve and muscle adaptation and can increase muscle strength in stroke patients [13]. The first three months after the patient has a brain stroke enters a state of high plasticity in this phase the therapy will have a more visible impact, and the patient can experience faster progress [7].

Mirror therapy provides visual feedback that can repetitively activate mirror neurons on the affected part, so that the brain will get feedback that triggers the neuroplasticity process and improves overall recovery [12]. The findings showed that mirror therapy given three to seven times a week, between 15 and 60 minutes for each session for two to eight weeks on average five times a week, 30-minute sessions for four weeks had a significant positive effect on motor function [9]. Mirror therapy performed for 30 minutes five times a week for eight weeks is effective in increasing the patient's muscle strength and functional status [17].

In Mr. S and Mrs. A mirror therapy carried out with regular blood pressure control and pharmacological therapy has a positive effect on the patient's upper extremity function. This condition was shown by an increase in muscle strength by 1 point in both patients. The visual illusion that occurs in the mirror therapy application that makes patients feel as if their hands are moving symmetrically simultaneously activates the left and right hemispheres of the brain and increases the excitability of the paresis extremities. Mirror therapy activates mirror neurons that provide visual feedback thereby improving paretic upper extremity function, which of course if carried out continuously will restore functional conditions and improve the ability to meet the needs of activities of daily living [18].

This study confirms that mirror therapy is effective in improving limb function in stroke patients. However, this condition is insufficient to meet both patients' activity needs. However, this is not enough to fulfill the activity needs of both patients. Mirror therapy requires continuous routine practice to prevent a decrease in muscle strength and get the maximum therapeutic effect. The limitation of this study is that patients must meet certain

criteria so that not all stroke patients can receive mirror therapy intervention, one of which is stroke patients with impaired visual function cannot receive this therapy.

CONCLUSION

Mirror therapy carried out with regular blood pressure control and pharmacological administration is effective for improving the functional status of patients, helping to increase muscle strength and movement in body parts that experience weakness. Mirror therapy can be applied and applied as an SOP and alternative intervention in the field of Nursing to increase muscle strength and meet activity needs in stroke patients. Mirror therapy requires continuous routine training to prevent a decrease in muscle strength and get the maximum therapeutic effect. Future research can increase the number of samples and provide treatment for a longer number of days

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AUTHORS CONTRIBUTIONS

All the authors have contributed equally.

CONFLICT OF INTERESTS

The authors declare no conflict of interest

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Original Research/Systematic Review

Effectiveness Familiar Auditory Sensory Training (FAST) on the Awareness Level of Head Injured Patients in the ICU

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ABSTRACT

Background *The main causes of head injuries include falls, being hit with an object, and motor vehicle accidents. In the WHO campaign entitled "Decade of Action for Road Safety 2021-2030" Data reported that, traffic accidents have reached 1.3 million deaths and 50 million cases of injury each year. The comatose patient has no attempt to respond back with the eyes, verbal, as well as motor. Familiar Auditory Sensory Training (FAST) is a non-pharmacological intervention that is considered safe and cost-effective.*

Methods: *A systematic literature review search of three databases of indexed international journals, namely Science Direct, PubMed, and Google Scholar was conducted. The inclusion criteria used for the search include original research, publication time 2018- 2023, written English, and accessible in full text. Studies were included if they have the keywords of "GCS" OR "coma patient" AND "familiar auditory" AND "TBI". Research articles were critically appreciated and analyzed through a table containing the title, author, year, methodology, results, and recommendations. Lastly, the data were synthesized narratively to address the study aims.*

Results: *There were 10 research articles that met the criteria.*

Conclusion: *The effectiveness of FAST can be influenced by several things, including the duration of the intervention, the severity of the head injury, and the medical treatment received by the patient. Based on the results of statistical analysis it is proven that FAST can increase the patient's level of consciousness score based on instrument assessment Glasgow Coma Scale (GCS).*

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KEYWORDS
familiar auditory sensory; traumatic brain injury; intensive care units; glasgow coma scale

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Cite this as: …….

INTRODUCTION

Head injury or Traumatic Brain Injury (TBI) is trauma resulting from a blow, jolt or impact to the head. This can result in thinking or memory disorders, motor disorders, sensation disorders (vision or hearing), as well as emotional changes in the form of emotional personality changes or depression. The main causes of head injuries include falls, being hit with an object, and motor vehicle accidents (CDC, 2023). In the WHO campaign entitled "Decade of Action for Road Safety 2021-2030" Data is reported that traffic accidents have reached 1.3 million deaths and 50 million injury cases every year (WHO, 2021). According to CDC data (2023), in 2021, around 190 Americans will die from head injuries every day. More than 223,000 cases of head injuries underwent hospital treatment in 2019. Therefore, head injuries are the main cause of death and disability in America, accounting for 30% of deaths.

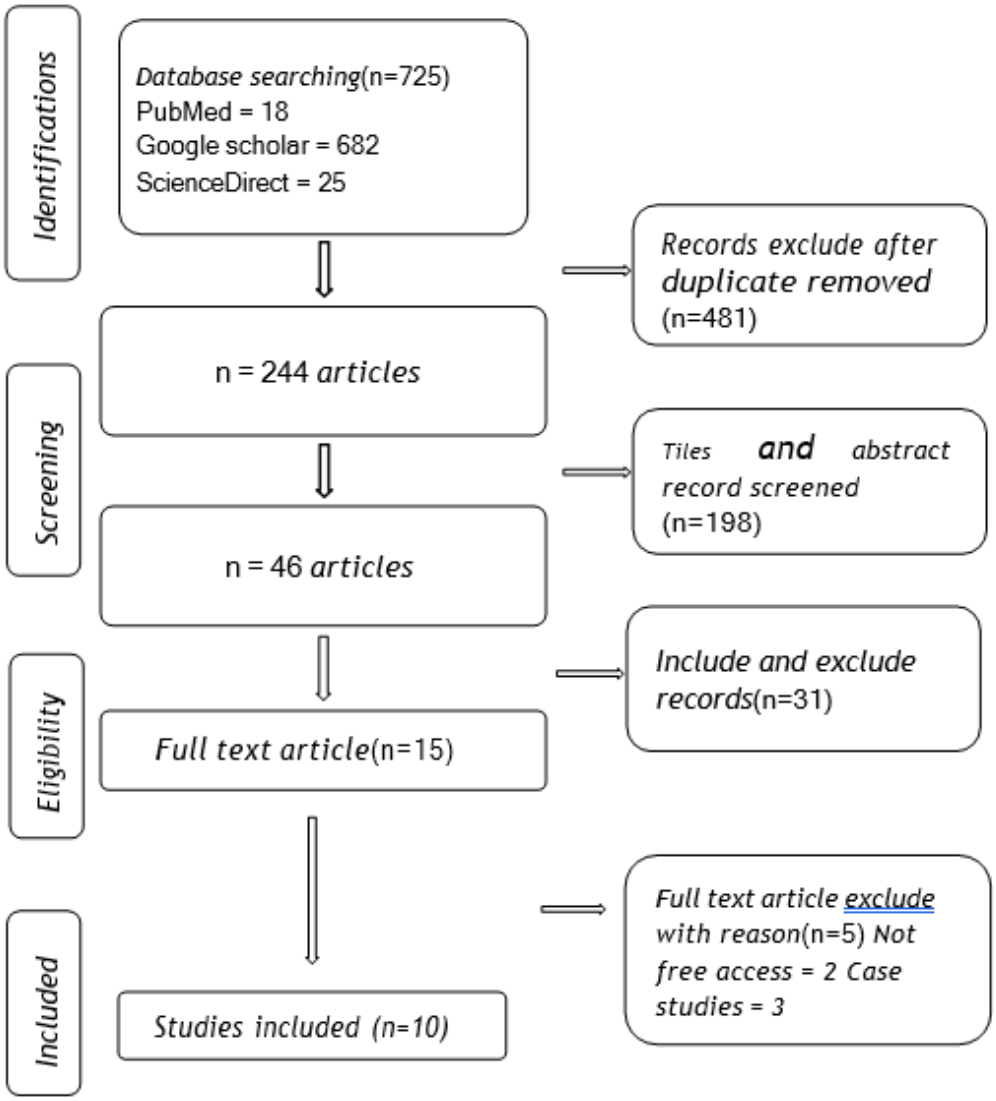
In Indonesia, traffic accidents are reported by the Central Statistics Agency (BPS). According to BPS data for 2017-2019, it is reported that there is an increase in the number of accidents every year. The highest number of accidents in 2019 was 116,411 accidents and resulted in 25,671 people dying, 12,475 people suffering serious injuries, while the rest suffered minor injuries. In Central Java province, the number of traffic accident victims in 2020 who died was 3,508 people, 48 people were seriously injured and 24,495 people had minor injuries. Meanwhile in the city of Surakarta there were 50 cases of death and 852 suffered minor injuries due to traffic accidents (Central Statistics Agency, 2023).

Head injury is a disease that requires intensive monitoring, so treatment in this case is usually carried out at Intensive Care Unit (ICU). On this scale, management is needed quickly and precisely. Glasgow Coma Scale(GCS) is an appropriate indicator used to measure the severity of head injuries. This indicator assesses eye response, motor response and response verbal. The severity of head injuries in terms of GCS scores includes mild head injuries (GCS 13-15), moderate head injuries (GCS 9-12), and severe head injuries (GCS 3-8) (Riduansyah et al., 2021). Patients with severe head injuries tend to be in a comatose state of consciousness. Comatose patients have no effort to respond back with their eyes, verbal, and motor.

Familiar Auditory Sensory Training (FAST) is a non-pharmacological intervention that aims to raise the patient's level of consciousness. This intervention is carried out by listening to sounds that are familiar to the patient, for example people who are known to be close to the patient. This is related to stimulation of the auditory sense which can have more of an effect on patients with decreased consciousness, because auditory stimulation is easier to activate due to its greater possibility of reaching the brainstem and cortex (Ariprativi et al., 2020).

MATERIALS AND METHOD

Data collection is carried out by conducting searches according to predetermined topics. The articles used were published in the 2018 – 2023 period and were obtained online full text with format pdf. The search stage is carried out using nursing or health research databases that have been published online, articles obtained from academic databases such as Science Direct, PubMed, Google Scholar. Search for article sources with Boolean System swhich is limited by AND and OR, namely commands used in search engines such as using the word AND in the keywords "GCS" OR "coma patient" AND "familiar auditory" AND "TBI". The inclusion criteria used were patients who lost consciousness in the ICU due to a head injury Familiar Auditory Sensory Training (FAST), the influence on the level of consciousness is measured by Glasgow Coma Scale (GCS), and the research design used Randomized Controlled Trial (RCT), experimental studies, quasi-experimental studies. The exclusion criteria used were patients with decreased consciousness in the ICU due to chronic illness, and the effect on the level of consciousness was measured by a score Full Outline Unresponsiveness (FOUR). After selection based on inclusion and exclusion criteria, published articles were analyzed and extracted.



RESULTS

Articles that have met the inclusion criteria were analyzed by describing the contents of the title, first author's name, year of publication, the methodology used, and the result

Table 1. Summary of articles

NO	Title	Author	Year	Methodology	Result
1	Effectiveness of voice stimulus on the level of consciousness, physiological parameters and behavioral responses in comatose patients – A feasibility study. https://doi.org/10.1016/j.cegh.2020.08.006	Varghese et al.	2020	**Design**: Randomised Control Trial (Consolidated Standards of Reporting Clinical Trials (CONSORT)) **Sample:** 20 comatose patients with GCS between 3-8 in a tertiary hospital of Udupi district, Karnataka, India **Variable:** age, gender, religion, marital status, family type, education, occupation, informant, medical diagnosis, duration of hospitalization in days, GCS score on admission, surgical intervention **Instrument:** Auditory Brain Stem Response test, Adobe audition 3.0 computer software, and headset with microphone, Audio-technica ATH-M40x Professional Monitor Headphones, Philips MP3 Player, GCS **Analysis:** RMANOVA test	There was an increase in the average cumulative GCS score of the intervention group from day 1, before the intervention (6.6) to day 5 (8.6) after the intervention. Meanwhile, in the control group the cumulative average GCS score before intervention decreased from day 1 (5.6) to day 5 (5.0). In the intervention group there was also an increase in GCS scores after intervention except on day 3 and day 4, whereas in the control group before and after intervention GCS remained the same from day 1 to day 5.
2	Effectiveness of auditory sensory stimulation on level of consciousness and cognitive function in traumatic brain injury patients: A randomized controlled clinical trial.	Hamid et al.	2022	**Design:** Randomized controlled clinical	According to the findings of the independent sample t-

	https://doi.org/10.18502/npt.v9i4.11206			trial **Sample:** 60 patients with traumatic brain injury **Variable:** gender, marital status, age, education level, employment status, duration of coma, diabetes, hypertension, level of consciousness, level of cognition **Instrument:** demographic information questionnaire, GCS, RLAS (Rancho Los Amigos Scale), audio recorder, headphones **Analysis:** ANOVA test and Independent T-test	test, there was a significant increase in the level of consciousness on the third, fifth and sixth days after the intervention in intervention group patients compared to the control group (P=0.001)
3	Effect of Choice-Based Sensory Stimulation as a Coma Stimulation Technique on Traumatic Brain Injury.	Deshpande et al.	2019	**Design:** Randomized controlled clinical trial **Sample:** 30 subjects diagnosed with traumatic brain injury **Variable:** Gender, auditory stimulus, visual stimulus, tactile stimulus, movement stimulus **Instrument:** WNSSP, GCS, family photo frames, bright colored pictures, mirrors, wet cloths, earphones, audio recordings. **Analysis:** non-parametric paired test and Mann-Whitney test	Among the groups, the experimental group showed significant improvement in GCS and CRS with (p=0.05). In this study, the experimental group received choice-based sensory stimulation provided by family members and the control group received conventional sensory stimulation in the form of instrumental music.
4	Impact of a sensory stimulation program conducted by family members on the consciousness and pain levels of ICU	Adineh et al.	2022	**Design:** mixed-method study using a “convergent	According to the results of the

	patients: A mixed method study. https://doi.org/10.3389/fmed.2022.931304			parallel" **Sample:** 66 patients with brain injuries were treated in the ICU **Variable:** age, initial GCS, diagnosis, cause of brain injury, gender, SOFA score, APACHE IV score, auditory stimulus, visual stimulus, tactile stimulus, motor stimulus **Instrument:** GCS, BPS, family photos, videos, beautiful pictures, aromatherapy, patient's favorite music, audio recording of the patient's family's voice. **Analysis:** Independent-sampleT-Test, ANOVA test, Chisquare test, MAXQDA software	Greenhouse-Geisser test for GCS scores (comparison within groups), the overall effect of time was not statistically significant (P =0.555). This means that the effect of the intervention on the patient's GCS score remains the same on different days. However, the relationship between time and group was statistically significant (P =0.001). While the mean GCS was almost constant over the 7 days in the control group, the mean GCS in the intervention group had an almost increasing trend over those 7 days.
5	Effect of Auditory Stimulation With Occupational Noise on the Consciousness Level in Comatose Traumatic Brain Injury Patients: A Clinical Trial Study https://doi.org/10.32598/jhnm.33.2.2292	Goudarzi et al.	2023	**Design:** experimental study **Sample:** 50 comatose patients with TBI who were treated in the intensive care unit of a hospital in Qom City, Iran. **Variable:** Gender, age, marital status, education level, occupation, history of ICU admission, drug addiction, cause of coma, type of brain injury, history of surgery, GCS **Instrument:** GCS, voice recorder Sony model ICD-PX470, headphones Sony	The mean ± SD GCS value before stimulation was 5.28 ± 1.81 in the control group and 5.12 ± 1.90 in the intervention group. This difference was not statistically significant. The mean ± SD GCS value after stimulation was 6.60 ± 3.25 in the control group and 8.80 ± 4.05 in the intervention group. This difference was statistically

				model MDR-XB250 **Analysis:** Chi-square test, and independent T test	significant (P=0.038). The level of consciousness in the intervention group increased more than that in the control group in the 10 days of the study.
6	The Effect of Sensory Stimuli With a Familiar Voice and Patient's Auditory Preferences on the Level of Consciousness of Brain Injury Patients Admitted to Intensive Care Units http://doi.org/10.32598/ijn.34.5.7	Vanoni et al.	2021	**Design:** experimental study **Sample:** 45 patients treated in the intensive care units of selected hospitals in Ahvaz City in 2021 **Variable:** gender, education level, disease diagnosis, cause of hospitalization, level of awareness of hearing preferences, level of awareness of hearing preferences with sounds familiar to the patient. **Instrument:** GCS **Analysis:** Descriptive and inferential statistical methods	The results of the 1-way analysis of variance of the average GCS score on the first day of hospitalization and before intervention were not statistically significant between the three groups. The average level of awareness of the auditory preference group and known sounds after the intervention was significantly higher than that of the control group (P<0.05). However, there was no significant difference between the two groups in auditory preference and familiar sounds (P<0.05).
7	Effectiveness Of Sensory Stimulation On Level Of Consciousness Among Traumatic Brain Injury Patients Admitted At Selected Tertiary Care Hospital, Bhubaneswar, Odisha – A Randomized Controlled Clinical Trial. http://doi.org/10.47750/pnr.2022.13.S01.175	Nanda et al.	2022	**Design:** randomized controlled clinical trial **Sample:** 30 TBI patients with GCS scores 6-10 **Variable:** GCS, age, gender, education, opinion, occupation, eye opening, verbal response, motor response	The research results showed that the pretest & posttest GCS scores in the control and experimental groups, in the experimental group the pretest score was 5.73 and

				Instrument: GCS **Analysis:** test schematic presentation and synthesis of study statistics and examine study hypotheses	the posttest score was 9.13. The difference between the pretest and posttest averages is 3.400 which is statistically significant, where the control group's pretest score is 7.27 and the posttest score is 10.47. The difference between the pretest and posttest averages is 3.200, this is also statistically significant
8	Outcomes of family-centred auditory and tactile stimulation implementation on traumatic brain injured patients. http://doi.org/10.1002/nop2.1412	Ahmed et al.	2021	**Design:** quasi experimental **Sample:** 60 adult patients suffered from traumatic brain injury and were admitted to the intensive care units of two university hospitals in Egypt. **Variable:** GCS, age, gender, marital status, education level, occupation, CT scan findings, mechanism of injury, concomitant injuries, comorbidities, auditory and tactile stimulation **Instrument:** GCS, Physiological Adverse Events Assessment (PAEs). **Analysis:** SPSS Version 20.0, Cronbach's alpha, Chi-squared test or the Fisher's exact test	The increase in the mean GCS score in intervention group patients was statistically significantly higher than that in control group patients on day 14 of the study (P= 0.000). Although both groups of patients were relatively similar at the start of the study, patients in the study group had higher mean GCS scores throughout the study period after the application of family-centered organized auditory and tactile stimulation compared with the control group.
9	The Effects of Familiar Voices on the Level of Consciousness among Comatose Patients: A Single-Blind	Muhammadi et al.	2019	**Design:** randomized controlled trial	Significant improvement in

	Randomized Controlled Trial. http://doi.org/10.9734/JPRI/2019/v27i230164			**Sample:** 60 comatose patients with head trauma were conveniently selected from the intensive care unit of a hospital in Rasht, Iran **Variable:** GCS, auditory stimulus, hemodynamic status, age, gender, marital status, education level, cause of brain injury, duration of coma, history of surgery **Instrument:** GCS, voice recorder (LD-73, Lander electronics), headphone, mp3 player **Analysis:** Chi-square, the paired-samples t, student's t test, dan the repeated-measures analysis of variance.	posttest GCS mean scores in the intervention group at all three measurement time points (P< .001). However, no significant differences were observed in the control group with respect to variation in mean posttest GCS scores over time. There was a significant difference in the interaction of time and group (P< .001)
10	The Effect of the Organized Auditory Stimulation with a Familiar Voice on Pain Intensity and Physiological Indices of Comatose Patients Admitted to the Intensive Care Unit. http://doi.org/10.5455/jrmds.20186311	Khojeh et al.	2018	**Design:** randomized clinical trial **Sample:** 40 intubated patients met inclusion criteria and were admitted to the ICU **Variable:** auditory stimulation, tactile stimulus, hemodynamic status, gender, marital status, duration of hospitalization, education level, basic disease, history of addiction, GCS **Instrument:** GCS, BPS (Behavioral Pain Scale), mp3 player, headphone **Analysis:** Friedman test, Mann Whitney test	The mean ± SD GCS value on the first day in the control group was 7.25 + 0.71 and in the experimental group 7.35 + 0.81, this was not statistically significant (P = 0.56). However, on the third day the Mean ± SD GCS value in the control group was 7.65 + 0.58 and the experimental group was 7.80 + 0.41, which was statistically significant (P = 0.42).

DISCUSSION

Familiar Auditory Sensory Training (FAST) is a non-pharmacological intervention that is considered safe and cost efficient. Familiar audio. This is what differentiates the FAST intervention from other auditory stimulation interventions. This intervention prioritizes providing auditory stimuli with sounds that are familiar to the patient, such as the voice of someone close to you or the patient's favorite song. The duration of the voice messages was between 10 to 15 minutes for all participants. The content and schedule of the message is carried out by the person the patient likes first introducing himself for 1 minute and informing the patient of the time and place, briefly explaining to the patient what happened to him for 1 minute, and telling common and promising sweet memories for 4- 6 minutes (Khojeh et al., 2018).

FAST implementation prioritizes the sense of hearing. In coma patients, the sense of hearing is the last sense to lose its function and there are no obstacles to its use (Khojeh et al., 2018). Therefore, this intervention is recommended to help raise the level of consciousness of comatose patients. The term FAST has an abbreviation Familiar Auditory Sensory Training, but several journals in literature review this mentions with auditory stimulation or auditory sensory stimulation. However, the context of FAST remains the same, namely an intervention that uses auditory stimulation by prioritizing auditory sensory.

Patients with head injuries tend to need appropriate and fast treatment. Therefore, interventions are needed that can support the course of management in intensive care. GCS (Glasgow Coma Scale) is felt to be able to help manage care in the ICU. Although GCS cannot assess abnormal brainstem reflexes and changes in breathing patterns as clinical signs of the development of coma severity.

However, GCS can be a good quantitative assessment tool in monitoring the level of consciousness and as a reference for improvement and worsening of the patient's condition (Najoan & Elisa, 2023).

The components used for assessment in GCS are eye, motor and verbal responses. Head injuries according to their severity are classified as mild head injuries with a GCS score of 13-15, light head injuries with a GCS score of 9-12, and GCS 3-8 which are considered severe head injuries. In severe head injuries, many patients are found to lose consciousness. The level of consciousness based on GCS is categorized into composment (score 15-14), apathy (score 13-12), delirium (score 11-10), somnolence (score 9-7), sopor (score 6-5), semi-coma (score 4), as well as coma (score 3) (Riduansyah et al., 2021).

This study shows that FAST has more significant effectiveness in raising the level of consciousness of head injury patients compared to other interventions given to the control group. Providing an auditory stimulus has an easier effect on the patient.

Familiar sensory stimulation activates the limbic system, which increases the activity of the sympathetic system. As a result of the cortex and interpreted in the center of its emotional response which leads to increased awareness and arousal of the patient.

The awareness of brain injury patients treated in the ICU who received a sensory and emotional stimulation program by family members was higher compared to the group who received this stimulation by nurses or other health workers (Adineh et al., 2022). According to Ahmad et al.'s article, 2021 explains that family involvement in a coma patient's daily life can help their recovery. This is because it is felt that the family can change sensory stimulation into something more meaningful so that it can create a feeling of comfort and peace for the patient. It is hoped that this familiar and supportive environment will be able to raise the patient's level of awareness. Thus it can be concluded that FAST (Familiar Auditory Sensory Training) has effectiveness on the level of consciousness of patients with head injuries in Intensive Care Unit (ICU).

CONCLUSION

Based on the analysis of the results from literature review. From this study, which took 10 international articles, it can be concluded that FAST has significant effectiveness in increasing the awareness of head injury patients in the ICU. The effectiveness of this intervention can be influenced by several things, including the duration of the intervention, the severity of the head injury, and the medical treatment received by the patient. Based on the results of statistical analysis, it is proven that FAST can increase the patient's level of consciousness score based on instrument assessment Glasgow Coma Scale (GCS). By increasing awareness of head injury patients in the ICU, it is hoped that the time can be shortened intensive care and increase the success of the treatment process.

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Original Research/Systematic Review

THE EFFECT ELECTRICAL STIMULATIONS ON CASES OF BURN HEALING

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ABSTRACT

Background: Burns are one of the injuries that can affect anyone. it is estimated that one in 3.5 million people will experience a burn injury. Burn infection is a serious problem because it causes a delay in the maturation of the epidermis and causes the formation of abdominal tissue. One of the new interventions that can be performed on burns is electrical stimulation. Electrical Stimulation aims to rebuild physiological cell migration by mimicking the current of injury (COI), namely an electrical current from the midsection of the body to an injured nerve or muscle, or to other tissues that are stimulated.
Purpose: To analyze the application of electrical stimulation to patients with burns over the last five years.
Methods: Used to analyze articles related to electrical stimulation in burns through data obtained from Google Scholar, Researchgate, Sciencedirect in the last five years as many as 5 journals that match the inclusion criteria set by the authors.
Results: The analysis show that the use of electrical stimulation on burns can help wound healing and improve peripheral tissue perfusion.
Conclusion: Electrical stimulations includes noninvasive therapy and physical-based therapy which easy to use as an additional therapy besides standard wound care. The duration is 20-60 minutes with frequency of 2-3 times a week.

Keywords: Burn injury, Electical stimulation, Wound healing

INTRODUCTION

Burns are a major public health problem globally, where the majority result in permanent impairment of appearance and function. The estimated incidence of burns is about 180,000 deaths per year. These deaths occur in several countries that have low to middle income. Several countries in the world have a high prevalence of burns, namely India, there are around 1,000,000 people suffering from burns per year. In Bangladesh, Columbia, Egypt and Pakistan there are around 17% of children with burns (World Health Organization, 2018). In the United States there are approximately 450,000 people affected by burns that require medical treatment, so the ABA set February 3, 2020 as National Burn Awareness Week (Tam Pham 2018)

Indonesia is a developing country that has a prevalence of 1.3% of burn injuries. In Central Java, the prevalence of burns was recorded at 1% with the distribution of cases as follows: 1.47% for 1-4 years, 0.45% for 5-14 years, 0.45% for 15-24 years, 0.45% for 25-34 years 1.35%, 35-44 years 1.53%, 45-54 years 0.64%, 55-64 years 1.95%, 65-74 years 1.17 %, age> 75 years as much as 0.55%. Partial burns occur in rural areas as much as 0.93%, as many as 1.04% occur in men and in women as much as 1.02% (Zakaria, Erviani, and Soekendarsi 2021)

Burn wound care requires a long time, sometimes requiring repeated operations and even if it heals it can cause permanent disability. So that the treatment of burns should be managed by a trauma team consisting of a specialist team of surgeons (plastic surgery, thoracic surgery, pediatric surgery), internal medicine specialists (especially hematology, gastroenterology, kidney and hypertension), nutritionists, medical rehabilitation, psychiatrists, and psychologists.The management of burns between children and adults is in principle the same, however, in children, burns can be more serious. This is because children have a thinner skin layer, it is easier for them to lose fluids, they are more prone to experiencing hypothermia (decreased body temperature due to cooling). The most common complications found in burn clients are shock, fluid and electrolyte deficiencies, hypermetabolism, infection, acute respiratory problems and death. In extensive burns, disability and depression can also occur (Greig, Torah, and Yang 2022).

One of the new interventions that can be done in cases of burns is electrical stimulation. The potential use of electrical stimulation (ES) as a therapy for wounds was first recognized in the mid-19th century and is based on the distinct electrical charges that can be detected on the skin surface and deeper layers, and also between injured and uninjured skin. Several clinical guidelines published by international bodies such as the Australian Wound Management Association and the Consortium for Spinal Cord Medicine 2014 suggest the use of electrical stimulation to help chronic wound healing. ES parameters can be adjusted to vary the frequency, wave amplitude, exposure duration and pulse type. The application of ES does not cause pain, and is generally done by placing electrodes around the wound, then distributing an electric potential that produces an electric current (Rajendran et al. 2021).

MATERIALS AND METHODS

The research design is a literature review. Literature review is a systematic, explicit and reproducible method for identifying, evaluating and synthesizing works of research results and ideas that have been produced by researchers and practitioners. The literature review aims to make

an analysis and synthesis of existing knowledge related to the topic to be researched to find empty space for research to be carried out.

The intervention included in the inclusion criteria is the ES (Electrical Stimulation) intervention with the outcome type limited to the effect of ES on the wound healing process. This literature review was compiled by searching published research articles. The sample population is all samples with various types of wounds who received ES therapy to help the wound healing process. Searches were carried out using Medline, Science direct, Pro-quest and Google Search with keywords for each selected variable. The articles found are read carefully to see whether they meet the author's inclusion criteria to be used as literature in writing a literature review. The search is limited from 2018-2023 which is accessed in full text in PDF format and has a quasi-experimental and RCT design. Published research articles that use ES therapy and are able to help the wound healing process will be included in the literature review.

This research was conducted by collecting data from various journals regarding the use of electrical stimulation in burn cases and then making comparisons with one another regarding the effect of using electrical stimulation in burn cases.

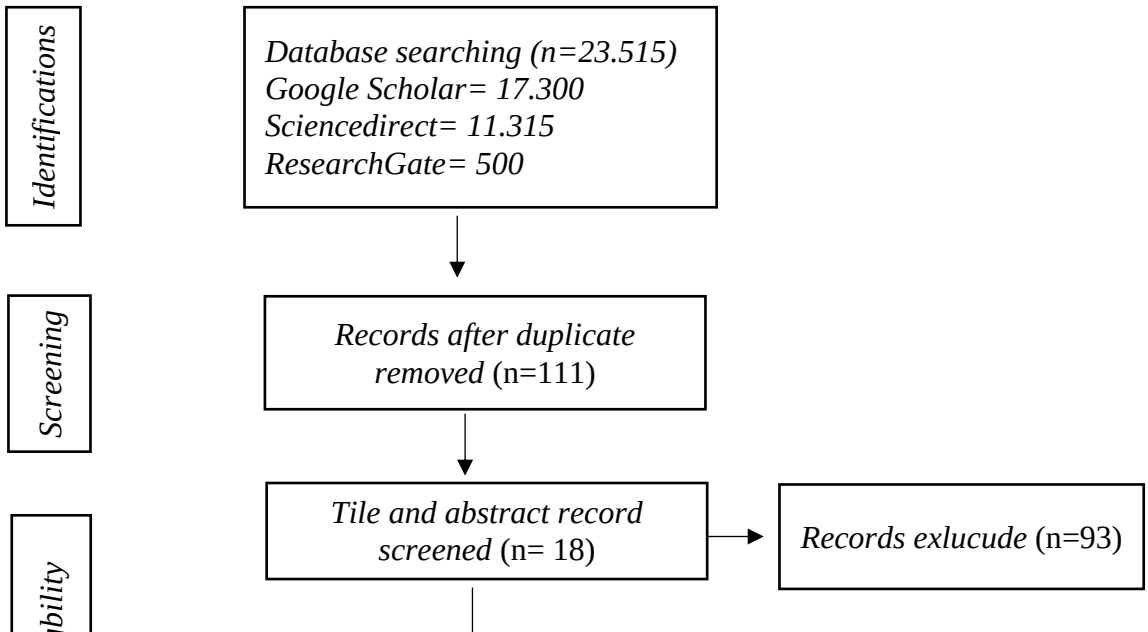
Table 1. Data Based Search Procedure

Data Based Search Procedure
Steps to search for articles using data based: 1. Electrical Stimulation OR Electric Stimulation 2. Burn Injury OR Combustio 3. Wound Healing 4. #1 AND #2 AND #3

Articles that fall within the inclusion criteria are analyzed, extracted and synthesized, then their evidence is determined. From the results of extraction and analysis, it is hoped that a conclusion will be found that can be used as a basis for carrying out nursing interventions in hospitals or community settings.

The following is the essence taken from the research: research title, researcher's name, year of publication, method, number of samples from the intervention group and control group, tools used during the research, research results and conclusions complete with significance values. The extracts taken are then entered into a table so that the extraction results are easy to read.

Bagan 1 Article Search Procedure



RESULTS

No	Author	Volume	Title	Metode (Desain, Sample, Variable, Instrumen, Analisis)	Result
1	Edwick et al. **2022**	Vol 6 No 42-50	Does electrical stimulation improve healing in acute minor burn injury, as measured by bioimpedance spectroscopy? A single center, randomized,controlled trial	**D:** Randomized controlled trial **S:** 30 patients with burns to multipe limbs. Performed for 14 days with a duration of 20hours/days. **V:** Wound healing, bioelectric impedance, electrical stimulations, burn injury and edema **I:** BIS to monitor the psychological processes of cells in wound healing, PhA to measure cell health and R_0 to measure wound edema impedance **Analisis:** Paired t-test	ES in healing burns can help reduce wound edema, when compared to routine care alone. It was found that multi-level mixed effects regression analysis showed the phase angle at 50kHz increased at a faster rate in stimulated wound. Stimulated wound showed an increased rate of edema reduction as measured by extracellular tissue impedance.
2	Ibrahim, Waked, and Ibrahim **2019**	Vol 28 No 4	Negative pressure wound therapy versus microcurrent electrical stimulation in wound healing in burns	**D:** Randomized controlled trial **S:** 45 patients with thermal-dermal burns of 25-40% of the total body surface. Performed for 3 weeks, with a duration of 5 minutes. **V:** Burn injury, microcurrent electrical stimulation, negative pressure therapy, wound healing **I:** Metric chart paper	Negative pressure wound therapy and microcurrent electrical stimulation proven to accelerate the healing process of burn. For 45 respondents, a statistically significant reduction in wound surface area was observed in all groups ($p<0.05$)

				Analisis: Chi square	
3	Gomes et al. **2018**	Vol 44 No 636-645	High-voltage electric stimulation of the donor site of skin grafts accelerates the healing process. A randomized blinded clinical trial	**D:** Randomized controlled trial **S:** 30 patients with skin graft burns. Performed for 10 days with a duration of 50 minutes. **V:** Burn injury, electrical stimulation, wound healing **I:** Electric dermatome model Humeca D42 **Analisis:** Wilcoxon	There appears to be a reduction in pain, an accelerated epitalization process, an improvement in the quality of the scar formed by the application of high voltage current to the skin graft donor site. The healing characteristics of the donor site such as vascularity, pigmentation, height, number of crusts formed, irregularity and quality of healing are better, besides the homogeneity and inertia of the image confirms the higher quality of healing.
4	M et al. **2018**	Vol 9 No 1-142	The Effectiveness of Tens (Transcutaneous Electrical Nerve Stimulation) in Reducing Pain during Replacing the Dressing in Hospitalized Patients in Burn Center of Sabzevar	**D:** Clinical trial study **S:** 40 burn patients treated at Sabzevar Vasee hospital. Done with a duration of 10 minutes. **V:** Transcutaneous Electrical Nerve Stimulation, burn injury, pain **I:** Transcutaneous Electrical Nerve Stimulation placebo **Analisis:** Mann-Whitney test	Tens (Transcutaneous Electrical Nerve Stimulation) proven effective in reducing pain in burn patients and also helps in the healing process of burns.
5	Avendaño-Coy et al. **2022**	Vol 19 No 1-11	Effectiveness of Microcurrent Therapy for Treating Pressure Ulcers	**D:** Randomized controlled trial **S:** 30 respondents were divided into 2 groups. 15 experimental respondents and 15 control respondents. Performed for 25	In conclusion, microcurrent therapy in the elderly improves pressure relief both quantitatively and qualitatively, without any side effects. A trial on burn patients reported a statistically significant difference in the number of bacteria in wounds, with

	in Older People: A Double-Blind, Controlled, Randomized Clinical Trial	days with a duration of 10 hours. **V:** Pressure Ulcers, burn injury **I:** Pressure Ulcer Scale for Healing (PUSH) **Analisis:** Annova	a 0.04% decrease in the microcurrent group versus an 86% increase in the control group.

All journals were found to have the same results, namely electric stimulation has an effect on burns. In this literature review, the authors chose journals to study that are related to the effect of electrical stimulation in burn cases. There are several methods and/or designs used in this literature review research, namely randomized controlled trials and clinical trial studies. The total sample in all journals is 175 respondents.

DISCUSSION

According to Rajendran et al. (2021), the severity of burns depends on factors, agent, duration of exposure, affected area, depth, along with trauma, age and previous disease conditions. The degree of burns is divided into three parts, namely first degree (superficial) which only affects the epidermis with marked erythema, pain, physiological functions are intact, blistering can occur, similar to a mild sunburn. Appears 24 hours after exposure and the healing phase is 3-5 days. Second degree (partial) is about the dermis and epidermis with marked blisters or the formation of vesicles and bullae, extreme pain, loss of physiological function. Healing phase without infection 7-21 days. Third degree or full thickness i.e. involving all layers of the epidermis and dermis, leaving no remnants of epidermal cells to fill in the damaged area, loss of pain, the color can be black, brown and white, affecting tissues including (fascia, muscles, tendons and bones).

The physiology of shock in burns results from the massive escape of fluid in the capillary circulation and affects the cardiovascular system due to loss or damage to capillaries, which causes fluid to escape or be lost from the intravascular compartment into the interstitial tissue. Erythrocytes and leukocytes remain in circulation and cause an increase in hematocrit and leukocytes. Blood and fluids will be lost through evaporation resulting in a lack of fluids. Compensation for shock with fluid loss, the body responds by reducing the circulation of the gastrointestinal system which can occur paralytic ileus, tachycardia and tachypnea is compensation for reducing vascular volume by increasing oxygen demand for tissue injury and system changes. Then it reduces perfusion to the kidney, and vasoconstriction occurs which will result in depression of glomerular filtration and oliguria (Zulbaran-Rojas et al. 2021)

The burn response will increase blood flow to vital organs and decrease blood flow to peripheral and non-vital organs. The metabolic response to burns is hypermetabolism which is the result of an increase in the amount of energy, increased catecholamine where there is an increase in temperature and metabolism, hyperglycemia due to increased glucose expenditure for metabolic needs which then occurs glucose depletion, nitrogen imbalance due to hypermetabolic status and tissue injury.
Damage to red blood cells and hemolysis lead to anemia, which then increases cardiac output to maintain perfusion. Growth can be stunted by growth hormone depression because it is focused on healing damaged tissue. Edema formation due to increased capillary permeability and at the same time vasodilation occurs which causes an increase in hydrostatic pressure in the capillaries. There is an abnormal exchange of electrolytes between the cells and the interstitial fluid in which sodium typically enters the cells and potassium exits the cells. Thus resulting in a deficiency of intravascular sodium (Zulbaran-Rojas et al. 2021)

One type of adjuvant therapy or additional therapy used is Electrical Stimulation. Electric Stimulation (ES) or electrical stimulation is a non-invasive therapy, and physical-based therapy that is easy to use. Quoted from Melotto, Tunprasert, and Forss (2022) ES has been suggested as adjuvant therapy to increase the standard of wound care in terms of healing rate (HR), healing time (HT) and percentage of wounds. healed (PWH) in chronic ulceration. ES aims to re-establish physiological cell migration by mimicking current of injury (COI) i.e. electrical currents from the midsection of the body to injured nerves or muscles, or to other stimulated tissues. Medical Express (2014) in (Nair 2018) suggests that exogenous electrical stimulation can increase the growth of blood vessels by as much as 50%, activate pathways for angiogenesis and increase the growth of

blood vessel tissue. Electrical stimulation that is carried out exogenously is able to change the ionic environment around the endothelial cells that form the lining of blood vessels inside the cells. This stimulus can link with proteins to activate signaling pathways that lead to growth in the capillary network where the proteins have a charge that can react with an electric field (Rosadi Seswandhana et al. 2020)

The use of electrical stimulation with low cathodal direct current can help the process of angiogenesis. Angiogenesis is an important component of the proliferative phase of wound repair. Angiogenesis is controlled by Vascular Endothelial Growth Factor (VEGF), Fibroblast Growth Factor-2 (FGF-2) and Sodium Oxide (NO). VEGFR-2 has two isoforms: soluble VEGFR-2 (sVEGFR-2) and membrane VEGFR-2. VEGF functions predominantly via binding to the membrane VEGFR-2 to induce angiogenesis. NO is a mediator that plays an important role in activating growth factor angiogenesis (VEGF). Hypoxic inducible factor-1α (HIF-1α) acts as a stimulator of angiogenesis factors (VEGF, FGF-2, and NO). In diabetic wounds, the release of HIF-1 α is inadequate, causing disruption of the wound healing process (Edwick et al. 2022)

Using Microcurrent Dressing (MCD) in rats, decreased expression of TNF-α and IL-1β after treatment on days 3 and 7 indicated a decrease in inflammation, which facilitated healing. In addition, regulation of growth factors (eg, VEGF and EGF) alters wound healing. Many cell types, including inflammatory cells, fibroblasts, and endothelial cells, release these factors. VEGF regulates multiple endothelial cell biological functions leading to the production of angiogenesis, and EGF accelerates keratinocyte growth to enhance epidermal regeneration. In this study, there was an increase in VEGF levels on days 3 and 7 and an increase in EGF levels on days 7 and 14 were recorded in the MCD rats. These results demonstrate a promoting effect of MCD on growth factor expression (Nair 2018)

The precise mechanism by which ES affects the expression of inflammatory cytokines and growth factors is not well characterized. Regulation of inflammatory response is closely related to nuclear factor-κB (NF-κB) activity, and studies have found that suppression of NF-κB activity by ES is one potential pathway to reduce inflammation. In addition, activation of bone morphogenetic protein (BMP)/Smad, phosphatydylinositol 3-kinase/protein kinase B (PI3K/PKB), epidermal growth factor receptor (EGFR) and mitogen-activated protein kinase (MAPK) signaling pathways induced by ES is associated with cell migration and wound healing. However, whether such signaling is involved in the healing of skin wounds caused by MCD remains unknown, and further research is needed (Nair 2018)

The use of electrical stimulation can also directly channel current into the wound using the Extracorporeal Shockwave Therapy (ESWT) tool. Extracorporeal Shockwave Therapy (ESWT) utilizes waves from high pressure to negative pressure. ESWT delivers shock waves in a few nanoseconds. The impulse is generated by an electro-hydraulic mechanism that forms a shock wave by igniting a spark from the liquid medium. The liquid medium evaporates to form liquid bubbles, which then break up to form a shock wave. The use of ESWT is reported to increase perfusion in injured tissue, assist angiogenesis which contributes to wound healing. The ESWT tool consists of 2 parts, the procedure console and the applicator. The shock wave is delivered by 500 impulses lasting between 2 - 5 minutes using an energy flux density or the amount of energy channeled to the

wound surface of 0.23mJ/mm2 and a speed of 4 I/s(impulse/second). The applicator will be covered with a sterile cover and ultrasound gel will be used as a medium on the wound surface (Edwick et al. 2022)

CONCLUSION

From the various articles found, it was concluded that the interventions given to the majority of the articles were carried out for a minimum of 2 weeks – 24 weeks with a duration of 20-60 minutes and were carried out in conjunction with standard wound care so as to help the wound healing process go faster. There are several methods that are carried out in the application of electrical stimulation. The first is to supply electricity from an available device (ex: SensiLase Pad-IQ SPP device). An electric current is then passed through the electrodes attached around the wound area. The electric waves that are delivered are adjusted to the patient's tolerance level with a range of 150 V (minimum) - 250V (maximum). The maximum current intensity is unknown because it depends on the conductivity of the skin, which is defined as the impedance of the tissue. Factors that affect tissue impedance can be skin dryness, thickness of the epidermis, quality of the adhesive pads of the electrodes and other physicochemical characteristics which can vary depending on individual health conditions, such as neuropathy, vascular disease or aging (Zulbaran-Rojas, Park, Lepow, et al. al. 2021)

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It must be declared by authors.

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Original Research/Systematic Review

The Effect of Su Jok Therapy on The Adolescents' Academic Stress Levels

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Background : Academic stress is a condition when individuals experience pressure from learning demands, self-assessment of expectations, academic challenges, and lack of confidence in their own abilities. The phenomenon of academic stress experienced by school-aged teenagers during the COVID-19 pandemic. Su Jok Therapy is a complementary therapy that stimulates auto-regulation and returns the body to a normal condition by providing support to the hands and feet. The aim of this research is to determine the influence of Su Jok therapy on the academic stress levels of adolescents at SMK Bintang Nusantara Karanganyar.

Methods : This type of research is quantitative research with a quasi-experimental method. The sampling technique was simple random sampling with consideration of inclusion and exclusion criteria for 36 students.

Result : The results of the Paired T Test show that there is an influence of Su Jok therapy on the academic stress level of teenagers at SMK Bintang Nusantara Karanganyar with a p value of 0.000 < 0.050**.**

Conclusion : Su Jok Therapy reduce adolescents' academic stress level. The therapy can be implemented in the students who got stress academic.

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INTRODUCTION

Adolescence is a period when individuals experience role confusion and changes in self-organization (Bhargava & Trivedi, 2018). According to the Republic of Indonesia Minister of Health Regulation Number 25 of 2014, teenagers are residents in the age range 10-18 years (RI Ministry of Health, 2014).

In adolescence, it is more difficult to find good coping than in adulthood (Aryani, 2016). There are several triggers for teenagers to experience stress, one of which is academic. Academic stress is demands in learning, anxiety about assessing self-expectations, and lack of confidence in overcoming academic obstacles (Sun et al., 2011). There are several triggers for student stress, such as low test scores, lots of study assignments, students' inability to handle

the academic load, and students' lifestyle environment (Barseli et al., 2017).

Research conducted in 3 private schools and 3 state schools in Kolkata, India found that 63.5% experienced academic stress (Deb et al., 2015). Other research at SMAN 6 Surabaya showed that 47.4 students experienced moderate academic stress (Ramadhani & Mahmudiono, 2021). Meanwhile, research at Padang State High School found that 15% of students experienced low academic stress (Taufik et al., 2013). Research conducted by Puspitanungrum et al., (2018) at SMA Negeri 1 Karanganyar found that students experienced academic stress due to study discipline and parents' demands.

According to Budiyati & Oktavianto (2020) academic stress experienced by teenagers is caused by problems with other friends, changes in life, looking for work, and relationships with other individuals. Academic stress is experienced almost all over the world due to the demands and activities of studying. According to several studies that have been conducted, academic stress experienced by teenagers can cause psychological, physical and environmental stress (Budiyati & Oktavianto, 2020).

Su Jok Therapy is a type of complementary therapy discovered by Prof. Park Jae Woo from South Korea in 1987 (Park in Yagil, 2019). Su Jok therapy functions to control health, because the parts treated have similarities to parts of the human body. In practice, Su Jok stimulates the hands and feet by means of massage, applying color, magnets, needles or other objects at certain points (Park in Nurjannah & Hariyadi, 2021).

A perspective study conducted by Nurjannah & Hariyadi (2021) Su Jok can reduce pain intensity in 46 respondents. Using Su Jok color therapy is very easy. Colors have energy as a catalyst for healing and supporting the body's work to return to normal and healthy (Mary in Harini, 2013). This was revealed by Psychoter in Suwandi et al., (2018) that color can stimulate serotonin levels. And color can strongly influence a person's mental state and can influence emotions and present mood (Suwandi et al., 2018).

Based on the results of a preliminary study conducted at SMK Bintang Nusantara Karanganyar on November 11 2021, 3 nursing students found that 3 students experienced academic stress which affected the way they studied at school due to pressure from social society and pressure to achieve. Online learning carried out by students is less able to understand the material presented. After being asked about methods to reduce academic stress, what students do is listen to music in the pop or dangdut genre, and are less aware of other methods and complementary methods.

Based on the description above, researchers are interested in examining the effect of Su Jok therapy on adolescents' academic stress levels.

MATERIALS AND METHOD

This research was conducted at Bintang Nusantara Vocational School Karanganyar in January-February 2022. This type of research is quantitative with a pretest-posttest control group design method. The population in this study was 67 grade 12 students at SMK Bintang Nusantara Karanganyar. The number of samples in this study was 36 students with sampling using simple random sampling techniques.

The research tool used to measure the level of academic stress is the ESSA (Educational Stress Scale for Adolescent) questionnaire consisting of 16 question items with 5 Likert scale answers using the middle value. The rating is 1 strongly disagree, 2 disagree, 3 neutral, 4 agree, 5 strongly agree. In implementing the therapy, researchers used the SOP for Providing Colored Su Jok Therapy to Reduce Academic Stress Levels. Researchers gave Su Jok therapy 4 times in 1 week with an interval of 2 days. The duration of one therapy was around 10-15 minutes.

RESULTS

The results of the research was showed in the table :

Table 1
Characteristics of respondents based on gender (n=36)

Gender	Treatment group		Control group	
	(f)	(%)	(f)	(%)
Male	3	16.7%	-	-
Female	15	83.3%	18	100%
Total	18	100%	18	100%

Based on the characteristics of respondents based on gender in table 1, it shows that the average female gender in the male treatment group was 3 (16.7%), female was 15 (83.3%), and in the control group there were no male or female gender. totaling 18 (100%).

Table 1. Characteristics of respondents based on age (n=36)

Group	Min	Max	Mean	Median	Std. Dev
Treatment	17	18	17.50	17.50	0.514
Control	17	19	17.44	17.00	0.616

Based on the characteristics of respondents based on age in table 2, it was found that the average age of respondents in the treatment group was 17.50 and in the control group 17.00.

Table 2. Academic stress level *before and after Su Jok Therapy*

Ket.	Min	Max	Mean	Median	Std. Dev
Pretest	57	73	64.39	63	4.996

Based on the academic stress pretest scores before the treatment was carried out, the average result was 64.39, min score 57, max score 73.

Table 3. Academic stress level *after Su Jok Therapy*

Ket.	Min	Max	Mean	Median	Std. Dev
Posttest	44	60	53.39	55.50	5.066

Based on the posttest academic stress scores after the treatment, the average score was

53.39, min score 44, max score 60.

DISCUSSION

Women experience higher academic stress than men because they involve feelings when acting and are good at communication and men use more logic when acting, use appropriate tone, words and emotions when communicating (Astuti et al., 2017) . Men's stress triggers are more due to differences in anatomy, psychology, body hormones and chemistry which cause differences in how to respond to stress that arises apart from the hormone oxytocin (Hafifah et al., 2017).

In adolescence, cognitive and psychological changes cause demands for independence and independent thinking from parents (Branje, 2018). Adolescence is prone to uncontrolled emotions and stress (Rahmawati et al., 2019). When stress occurs, teenagers lack good coping mechanisms.

Academic stress caused by online learning depends on the students themselves by adapting and accepting the learning method (Granita, 2021). The educational process can also cause stress for students because of the educational methods implemented by schools (Taufik et al., 2013). Research conducted (Pratama et al., 2021) shows that teenagers experience stress accompanied by high emotions that are difficult to control because of the environment, finances, demands, and because of the ongoing Covid-19 pandemic.

The academic stress experienced by teenagers during online learning is influenced by students' adjustment to the advantages and disadvantages of learning (Granita, 2021). Academic stress does not have a completely negative impact, there are also those who consider it a positive challenge (Taufik et al., 2013). According to Suwandi et al., (2018) colors can show the heart and influence a person's mental and emotional state. This is also supported by Harini (2013) that the color blue can restore stress and strengthen the mind and body to a calm state.

There was an influence between Su Jok therapy on the academic stress levels of teenagers at Bintang Nusantara Vocational School, Karanganyar. Research by Nurjannah et al., (2021) also revealed that Su Jok therapy can significantly reduce anxiety levels in Covid-19 patients.

Mary in Harini (2013) revealed that color can be a catalyst energy for healing and as a support for the body's working system to a normal and healthy state. The color blue can relieve stress and create a calm condition and can strengthen the condition of the mind and body. This was also mentioned by Budiman et al., (2019) that blue stimulation can be interpreted as stopping and restraining.

This is in line with what Psychoter stated in Suwandi et al., (2018) that color can stimulate serotonin levels in the body which is used to raise mood, create a state of well-being or calm, and reduce anxiety. The serotonin that has been released can activate pre-synaptic and post-synaptic nerves and then increase serotonin levels in the body.

CONCLUSION

The research results showed that the majority of respondents were female, 33 (91.7%) in the control group 18 (100%) and the treatment group 15 (83.3) and the average age of respondents in the control group was 17.44 and the treatment group was 17.50. Adolescents' academic stress before being given treatment, the average score in the control group was 63.50 and the treatment group was 63. Adolescents' academic stress after being given treatment, the average score in the control group was 60 and the treatment group was 53.39. There is an effect of Su Jok therapy on the academic stress level of adolescents in the treatment group with a p value of 0.000 < 0.050 and the provision of music therapy in the

control group with a p value of 0.010 < 0.050. The Su Jok therapy is recommended to be the strategy to overcome adolescent academic stress

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Original Research/Systematic Review

Audio Hypnotherapy on Blood Pressure and Cholesterol Reduction

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ABSTRACT

Background: Hypertension is *the silent killer*, the second highest causality of mortality in Indonesia, while increased cholesterol is one of the complications of hypertension. The risk of developing hypertension in Indonesia is significantly high. Lifestyle transformations generate a prevalence improvement of hypertension and high cholesterol. Hypnotherapy is a non-pharmacological therapy to reduce hypertension.
Objective: To analyze the effects of hypnotherapy on patients with hypertension and high cholesterol.
Subject and Method: The subjects involved 80 patients at Dr. Singgih's clinic who had high blood pressure and cholesterol above normal levels from July 2022 to July 2023. The sample utilized a randomized control trial technique, with 40 patients with high blood pressure and cholesterol receiving hypnotherapy, and 40 as the control group. The study employed an experimental design with a pretest-posttest with a control group design. The independent variable was hypnotherapy, and the dependent variables were blood pressure and cholesterol levels. The treatment's effectiveness was evaluated by measuring the differences in blood pressure and cholesterol levels before and after ten (10) treatment sessions.
Result: Hypnotherapy had a positive effect on controlling blood pressure and cholesterol levels. Subjects experienced a significant reduction in blood pressure in the treatment group from a mean of 178.8 / 96.87 mmHg, SD = 10.440 in pre-treatment to 154.55/87 mmHg, SD = 2.890 in post-treatment and was statistically significant (p=0.000). Subjects experienced a decrease in the mean cholesterol value from a mean of 227.100, SD= 12.265, at pre-treatment to 217.850, SD= 10.580, at post-treatment and was statistically significant (p=0.000).
Conclusion: Hypnotherapy evolved as a complementary therapy for people with hypertension and high cholesterol.

Keywords: Hypnotherapy, Hypertension, Choleste

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