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The Effectiveness of Honey For Swallowing Training in Stroke Patients With Dysphagia

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ABSTRACT
Stroke is the third leading cause of death in the world and the number one cause of disability in its sufferers. Most individuals with stroke generally experience dysphagia when their mental status is in a confusional state. Food modification is one of the efforts to manage dysphagia. The aim of this study was to determine the effectiveness of honey as a media for swallowing training in stroke patients with dysphagia. This study was a quantitative study with a quasi-experimental method. In this study, respondents were divided into two groups which were the intervention group and the control group. Each group consists of 11 respondents. After 3 days intervention, the results showed that a p-value (0.147) > 0.05. This value indicated that there was no significant difference between the two groups. However, the mean value of the honey as a media in dysphagia management showed a higher value that the value of pudding. In conclusion, the findings highlight that honey is effective to be used as as a media for swallowing training in stroke patients with dysphagia.

Keywords: Dysphagia, Honey, Stroke

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BACKGROUND

Stroke is an acute neurological deficit due to problems with blood vessels in the brain that occur suddenly. Stroke will cause symptoms according to the part of the brain that has problems (Zahro, 2014). Based on the pathophysiology, stroke is divided into two categories which are ischemic stroke and hemorrhagic stroke.

Stroke is the third leading cause of death in the world and the number one cause of disability in its sufferers (Zahro, 2014). The estimated annual incidence of stroke in the United States is 795,000. The incidence rate is divided into two categories, 610,000 events are stroke attacks for the first time and 185,000 events are recurrent strokes (Mozaffarian, 2016).

The high mortality, morbidity and treatment cost in stroke patients are the result of complications and concomitant symptoms. The complication that often occurs in stroke patients is disruption in the swallowing process or commonly known as dysphagia. The swallowing process is a very vital process in the digestive system.

Dysphagia commonly happens in the elderly, individuals with neurological disorders, individuals with brain or neck cancer, and in severe reflux conditions. The biggest cause of oropharyngeal dysphagia in the elderly is neuro myogenic disorders. It is found in 25-30% of stroke patients and in 20-50% of patients with Parkinson's and Alzheimer's disease (Ioana & Gabriela, 2014).

Generally, most individuals with stroke experience dysphagia when their mental status is in a confusional state. The signs and symptoms of dysphagia seen in stroke patients are obstruction complaints, weight loss, and bad breath (Utari, 2014). The number of stroke patients who experience dysphagia in the hospital is around 50-60%.

There is a previous study that applied a screening test using the Gugging Swallowing Screen (GUSS) instrument to carry out the early detection of aspiration risk in stroke patients with dysphagia. The results of this study stated that the risk of aspiration increasedin stroke patients with dysphagia when the score was <10. This condition is an indication to NGT insertion in stroke patients with dysphagia (Arnold *et al*., 2016).

Food modification is one of the efforts to manage dysphagia. The choice of food and drink types in the management of dysphagia needs attention. Liquids that are too watery such as water, coffee, or tea can quickly pass into the pharynx and larynx. It can increase the risk of aspiration in some patients (Stelle *et al.,* 2014).

Modification of food or liquid can be seen from the level of viscosity. The viscosity of a liquid can be measured using a device called a viscometer. There are several liquids that have viscosity and are categorized according to their grades. Honey is a food that is in the second category based on its viscosity.

Honey is a sweet solution and a product from flowers that experience an aerodigestive process in the gastrointestinal tract of bees. Honey is a thick and brownish liquid. Honey is concentrated through a dehydrating process in a beehive (Boussaid et al., 2018). The study conducted by Leder et al. (2013), said that honey is good to be given to patients with dysphagia.

The results of observations at Zone A in the fifth floor of the Cipto Mangunkusomo Hospital showed that there were approximately 6-15 stroke patients per day with dysphagia conditions. The dysphagia management procedure in the Neurology Room of the hospital were carried out using pudding. Based on the literature review and existing phenomena, it becomes a challenge for nurses to manage dysphagia through a swallowing training program in stroke patients with dysphagia. Thus, the aim of this study was to assess the effectiveness of honey in swallowing training for stroke patients with dysphagia.

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METHODS

This study was a quantitative study with a quasi-experimental method. This study was conducted at Zone A Neurology room in the fifth floor of Cipto Mangunkusumo Hospital. Data collection was carried out in 2 weeks. The population of this study were all stroke patients in the Neurology Room of Cipto Mangunkusumo Hospital during the study time period.

Respondents in this study were obtained using a non-probability accidental random sampling technique. The total respondents were 22 stroke patients with dysphagia who were divided into control and intervention groups. Each group consisted of 11 respondents. The control group received swallowing training with pudding as it has been used every day. Meanwhile, the intervention group received swallowing training with honey.

RESULTS

Table 1. Respondent's characteristics

Characteristics	Intervention group	Control group
Age (M ± SD)	45.64 ± 12.61	48.27 ± 11.79
Sex		
Male	5 (45.5%)	6 (54.5%)
Female	6 (54.5%)	5 (45.5%)
Types of stroke		
Ischemic stroke	4 (36.4%)	5 (45.5%)
Haemorrhagic stroke	7 (63.6%)	6 (54.5%)
Total	11 (100%)	11 (100%)

Table 1 showed that most of respondents' age in the intervention group was between 33-57 years old. The majority of respondents in the intervention group were female. Most of respondents were patients of hemorrhagic stroke with the total of 7 respondents (63.6%).

In the control group, most of respondents' age was between 37-59 years old. The majority of respondents in the control group were male with the total of 6 respondents (54.5%). Most of respondents in the control group were patients of hemorrhagic stroke.

Table 2. First day of intervention

Patient's condition	Intervention group	Control group	P-Value
Coughing / choking			0.677
Yes	5 (45.5%)	6 (54.5%)	
No	6 (54.5%)	5 (45.5%)	
Voice changes			1.000
Yes	-	-	
No	11 (100%)	11 (100%)	
Total	11 (100%)	11 (100%)	

Table 2 showed that coughing or choking was experienced by all of groups. In the control group, there were 6 respondents (54.5%) who experienced coughing or choking. Meanwhile, there were 5 respondents (45.5%) who experienced coughing or choking in the intervention group.

Other variables that measured were voice changes. From the table 2, the results showed that there were no respondents in each group who experienced a voice change or 100% did

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not experience a change in their voice. The results of the data analysis showed that the significance value was (1,000) > 0,05.

Table 3. Third day of intervention

Patients condition	Intervention group	Control group	P-value
Coughing/choking			0.147
Yes	-	2 (18.2%)	
No	11 (100%)	9 (81.8%)	
Voice changes			1.000
Yes	-	-	
No	11 (100%)	11 (100%)	
Total	11 (100%)	11 (100%)	

The results shown in table 3 were the coughing or choking conditions that occurred in both groups of respondents after 3 days of intervention. The results above indicated that in the intervention group, all respondents (100%) did not experience coughing or choking after the three-day intervention using honey. Whereas, in the control group, there were 2 respondents (18.2%) who experienced coughing or choking after three days of intervention.

The results in table 3 showed that in all groups (100%), there were no respondents who experienced changes in their voice after the three-day intervention. These results showed that there was no change since the 1st day of intervention. The results of the data analysis showed that the significance value was (1,000) > 0,05.

DISCUSSION

The results of the statistical tests in the intervention group that used honey in swallowing exercises with the parameters of coughing or choking conditions from the 1st until 3rd day of intervention showed the same results, which were that there was no significant difference with the control group. The result of the significance value was (0,677) > 0,05 on the 1st day of intervention and (0,147) > 0,05 on the 3rd day of the intervention. This value means that there were no significant differences between the two groups. However, other results showed if there was an increase between the 1st and 3rd day of the intervention. This is indicated by the number of respondents in the intervention group. There were 5 respondents who experienced coughing or choking on the 1st day of the intervention and 0 respondent on the 3rd day of intervention. The decrease in total of respondents who experienced coughing or choking shows that honey provides more effectiveness to be used as a media in swallowing training.

This study answers previous theories that food modification is important in the management of dysphagia in stroke patients (Steele et al., 2014). In that study, it was explained that the food modification used honey. Honey usage showed the benefits in the patient's swallowing training. Previous literature studies also support the results of this study. Hanson (2016) also stated that the management of oropharyngeal dysphagia through food modification using a thicker textured liquid and also pureed food provided better results in swallowing function.

The results of this study also showed that the two groups did not have a difference in terms of changes in the patient's voice. These results were the same between the 1st day of intervention and the 3rd day of intervention. All respondents in both groups did not experience changes in their voice during the swallowing training process either on day 1 or day 3 of the intervention.

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The results of this study are supported by previous studies. A previous study stated that there were several ways in the management of patients with dysphagia. One of them was food modification (Pandaleke et al., 2014). In that study, food modification was used to train the patient's swallowing ability, by using honey. The results showed by that study stated if the modification of the diet could improve the patient's ability to swallow. The patient's ability to swallow increases as indicated by the absence of coughing or choking, obstacles in the swallowing process, and also changes in voice.

CONCLUSION

The two media used for dysphagia management in this study had a positive impact on the patient's ability to swallow. Honey has an advantage which is indicated by the percentage of coughing or choking incidence in both groups. After the three-day intervention, all respondents in the intervention group did not experience coughing or choking. In conclusion, the findings highlight that honey has more effectiveness as a media in swallowing exercises in stroke patients with dysphagia.

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