ORIGINAL RESEARCH

FACTORS RELATIONSHIP ORAL HYGIENE AND THE INCIDENT OF RECURRENT APHTHOUS STOMATITIS IN THE WORKING AREA OF THE HEALTH CENTER

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Article Info	Abstract
  Corresponding Author: Apriyanti: Nursing Study Program, University of Mandala Waluya, Kendari, Indonesia Email: aisyahapril280@gmail.com	**Background**: Stomatitis, a prevalent oral disease impacting chewing function, is influenced by oral hygiene, nutrition, and trauma. This study aims to explore their relationship to stomatitis within the Ranomeeto Public Health Center's working area in South Konawe Regency. **Purpose**: To analyze how oral hygiene, nutrition, and trauma correlate with stomatitis incidence. **Methods**: A quantitative cross-sectional study involved 68 respondents, chosen via proportional random sampling. Conducted from July to August 2019, data was gathered through questionnaires and analyzed using the chi-square test. **Results**: The study revealed significant correlations between stomatitis and oral hygiene ($p = 0.007$), nutrition ($p = 0.000$), and trauma ($p = 0.000$). Oral hygiene showed moderate correlation (phi coefficient = 0.329), nutrition exhibited moderate correlation (phi coefficient = 0.490), while trauma demonstrated a strong correlation (phi coefficient = 0.527). **Conclusion**: In the Ranomeeto Public Health Center's area, a notable connection exists between stomatitis and oral hygiene, nutrition, and trauma. Emphasizing attention to these factors is pivotal for effective prevention strategies.

Background

Stomatitis, also known as recurrent aphthous stomatitis (SAR) or canker sores, is a prevalent oral ailment that affects various age groups, including children, teenagers, adults, and the elderly. This condition often manifests as major, minor, or herpetiform ulcers on the non-keratinized oral mucosa (Amtha, 2016). According to the World Health Organization (WHO) 2012 data, severe periodontal disease affects 15-20% of adults globally, while the Federation Dentaire Internationale (FDI) reported oral disease impacting 3.9 million individuals worldwide in 2015 (Syarif, 2017). The prevalence of SAR worldwide ranges from 5% to 66% of the population, averaging around 20%, with the highest prevalence reported at 25% (Yogasedana, 2014; Amtha R., 2016). In England, stomatitis affects approximately 15-20% of the population (Widyastutik, 2017).

In Indonesia, SAR affects 15-20% of the population, with the initial onset occurring in 80% of cases before the age of 30; however, SAR in older individuals might represent a more complex syndrome (Sasanti, 2018). Dental and oral health issues in Indonesia have been on the rise, with the prevalence of dental problems increasing from 23.2% in 2007 to 25.9% in 2013, as per the 2013 Basic Health Research (Riskesdas) data (Ministry of Health of the Republic of Indonesia, 2014). The Southeast Sulawesi Provincial Health Service noted an increase in dental and oral health problems from 27.5% in 2007 to 28.6% in 2013, starting

from children aged 12 years (Indonesian Ministry of Health, 2016). Specifically, in the Ranomeeto Health Center's working area in South Konawe Regency, stomatitis cases have been recorded: 763 cases in 2018, 798 cases in 2019, and 801 cases in 2020. From January to April 2021, 82 cases were reported, with 29.3% in the 12–34 age group, 52.4% in the 35–44 age group, and 18.3% in the 45–54 age group (Ranomeeto Community Health Center, 2022).

The impact of stomatitis on individuals can be significant, affecting their chewing function, reducing appetite, and diminishing nutritional intake, particularly vitamins C, B1, B2, and iron. Irregular eating patterns due to daily routines and busyness further exacerbate these effects, potentially compromising the body's resistance and contributing to stomatitis (Widyastutik, 2017). This disease, while relatively mild and non-life-threatening, significantly impairs physiological functions such as mastication, swallowing, and speech, thus affecting oral cavity functionality and nutritional intake, ultimately influencing a person's quality of life (Noviana, 2018).

The etiological factor of stomatitis is idiopathic (not yet known), but there have been many allegations regarding the predisposing factors for stomatitis, including oral hygiene, nutrition, trauma, stress, hormones, and electrolyte water loss (Wardiningsih, 2011). The etiology of SAR is currently not known with certainty, but there are several predisposing factors that are thought to be related to the occurrence of SAR. Some of these factors include nutritional deficiencies, trauma, genetics, stress, hormones, and allergies (Sulistiani, 2014). Several studies on stomatitis and its causes, including research conducted by (Darmanta, 2013), found that the factors that most trigger stomatitis are trauma, stress, and not consuming enough food containing vitamin C. Research by (Manurung, 2014) shows that oral hygiene, which involves cleaning and freshening the mouth, teeth, and gums, has been found to be associated with the incidence of oral cavity infections.

(Rahmayani's, 2016) research regarding nutrition found that there is a relationship between diet and the incidence of stomatitis, namely that eating foods that are deficient in vitamin C, vitamin B1, vitamin B2, iron, and foods that have a sharp texture can accelerate the occurrence of membrane injuries in the cavity. mouth. (Wardiningsih's, 2011) research regarding trauma as a cause of stomatitis consists of toothbrush trauma due to trauma to the oral mucosa caused by excessive use of the toothbrush and incorrect toothbrushing, which can damage the teeth and tissue in the oral cavity. There is also trauma from biting the inside of the mouth. Many people suffer injuries to the mouth because they accidentally bite their lips and soft tissue in the oral cavity. This can become an unconscious habit or occur during sleep, and injuries are also caused by biting the mucosa when eating and being pierced by braces, which can cause ulcers that can result in stomatitis. The aim of this research is to determine the factors associated with the incidence of stomatitis in the work area of the Ranomeeto Community Health Center, South Konawe Regency.

Method

This type of research is quantitative with a cross-sectional study design, namely a research design that aims to determine the relationship between the independent variable and the dependent variable. The data is taken once at the same time. (Zoahira & Purnamasari, 2023). This research was carried out for one month in August 2022. This research was carried out in the work area of the Ranomeeto Community Health Center, South Konawe Regency.

Research Population

The population in this study were all patients with dental and oral diseases who came to visit the Ranomeeto Community Health Center, with a total of 82 cases from January to April.

Sample

The sample in the research was taken from a portion of the population that met the research criteria, so the sample size was met. The sample size in research is based on the formula: (Nursalam, 2013).

$$n = \frac{Z^2_{1-\alpha/2}\, p(1-p)N}{d^2(N-1) + Z^2_{1-\alpha/2}\, p(1-p)}$$

Information:

N   : Population Size

n   : Sample Size

Z2   :95% Confidence Level means (1-α) = 100-95 = 5% or 0.05,
 at α 0.05 the z value is 1.96² = 3.841.

p   : Proportion (0.5)

d2   :Precision set 5% (d = 0.05)

So the number of samples obtained is as follows:

$$n = \frac{3{,}841 . 0{,}5(1-0{,}5)82}{0{,}05^2(82-1) + 3{,}841 . 0{,}5(1-0{,}5)}$$

$$n = \frac{78{,}7405}{1{,}16275}$$

$$n = 67{,}7$$

So a sample of 68 respondents was taken. The sampling technique is proportional random sampling, namely sampling based on a population draw or lottery technique based on predetermined sample criteria that aim to be representative of every village in the work area of the Ranomeeto Health Center, South Konawe Regency. Subjects who met the research criteria were included in the study for a certain period of time, so the sample size was 68 respondents. The determination of sample criteria is based on inclusion and exclusion criteria. The inclusion criteria are patients who are willing to be respondents and patients with dental and oral diseases who come to visit the Ranomeeto Community Health Center. And patient exclusion criteria include having a health education background or being a health worker.

Instrument

The instrument uses a questionnaire created by researchers and has been tested for validity and reliability, including an oral hygiene questionnaire, a nutrition questionnaire, and a trauma questionnaire, each of which consists of 10 negative questions. If you answer "yes," you will be given a score of 0 (zero), if you answer "yes," you will be given a score of 0 (zero), and if you answer no," you" will be given a score of 1 (one). The assessment of these variables refers to the Guttman scale.

Ethics clearance

This research has passed ethical tests, and there is no conflict of interest.

Results

Demographic Characteristics

Table1. Characteristics of Respondents Based on Age in the Community Health Center Work Area

No	Family Characteristics	Frequency Distribution (n= 68)	
		F	**%**
1	**Age**		
	19 – 24	13	19.1
	25 – 30	18	26.5
	31 – 36	21	30.9
	37 – 42	5	7.4
	43 – 48	8	11.8
	49 – 54	2	2.9
	55 – 60	1	1.5
2	**Gender**		
	Man	47	69.1
	Woman	21	30.9
3	**Education**		
	Elementary school	5	7.4
	Junior high school	9	13.2
	High school seniors	42	61.8
	Diploma/bachelor	12	17.6
	Total	**68**	**100.0**

Based on the results of Table 1, shows appears that of the 68 respondents, the largest number were 31–36 years old, with 21 people (30.9%), while the lowest respondent age was 55–60 years old, with 1 person (1.5%). shows that of the 68 respondents, the gender of the most respondents was male, 47 people (69.1%), while the fewest were women, 21 people (30.9%). showed that of the 68 respondents, the highest level of education was high school, namely 42 people (61.8%), while the lowest level of education was elementary school, namely 5 people (7.4%).

Table 2. Distribution of Respondents Based on Stomatitis Incidence in Community Health Center Work Areas

No.	Stomatitis Occurrence	Frequency (n)	Percentage (%)
1	No	30	44.1
2	Yes	38	55.9
	Amount	**68**	**100.0**

Table 2 shows that of the 68 respondents, the majority suffered from stomatitis, namely 38 people (55.9%) and 30 respondents who did not suffer from stomatitis (44.1%).

Table 3. Distribution of Respondents Based on Oral Hygiene in Community Health Center Work Areas

No.	*Oral Hygiene*	Frequency (n)	Percentage (%)
1	Good	35	51.5
2	Not good	33	48.5
	Amount	68	100.0

According to the findings presented in Table 3, the majority of the 68 respondents had good oral hygiene, namely 35 people (51.5%), and 33 people (48.5%) had poor oral hygiene.

Table 4.Distribution of Respondents Based on Nutrition/Foods Containing Vitamin C in Puskesmas Work Areas

No.	Nutrition	Frequency (n)	Percentage (%)
1	Good	25	36.8
2	Not enough	43	63.2
	Amount	**68**	**100.0**

As depicted in Table 4, the majority of the 68 respondents had poor nutrition, namely 43 people (63.2%), and 25 respondents had good nutrition (36.8%).

Table 5. Distribution of Respondents Based on Trauma in the Community Health Center Work Area

No.	Trauma	Frequency (n)	Percentage (%)
1	Light	32	47.1
2	Heavy	36	52.9
	Amount	**68**	**100.0**

Table 5 shows that of the 68 respondents, the majority experienced severe trauma, namely 36 people (52.9%), and 32 respondents experienced mild trauma (47.1%).

Bivariate Analysis

Table 6 showed that of the 68 respondents, there were 35 who had good oral hygiene and 33 who had poor oral hygiene. Of the 35 respondents who had good oral hygiene, there were 21 respondents (60.0%) who did not suffer from stomatitis and 14 respondents (40.0%) who suffered from stomatitis. Furthermore, of the 33 respondents who had poor oral hygiene, there were 9 respondents (27.3%) who did not suffer from stomatitis and 24 respondents

(72.7%) who suffered from stomatitis.

Table 6. Relationship between Oral Hygiene and Stomatitis Incidence in the Ranomeeto Community Health Center Work Area, South Konawe Regency

Oral Hygiene	Stomatitis Occurrence				Total		ρ value (Ø)
	No		Yes				
	n	%	n	%	n	%	
Good	21	60.0	14	40.0	35	100	0.007 (0.329)
Not good	9	27.3	24	72.7	33	100	
Total	**30**	**44.1**	**38**	**55.9**	**68**	**100**	

Based on the results of statistical analysis using chi square, the value obtained is ρ = 0.007 (ρ < 0.05), so that H0 is rejected and Ha is accepted. This means that there is a relationship between oral hygiene and the incidence of stomatitis in the Ranomeeto Community Health Center Working Area, South Konawe Regency, at the 95% confidence level (α = 0.05). The results of the correlation analysis obtained a phi coefficient of 0.329, where the magnitude of the phi correlation coefficient is categorized as moderate, namely between 0.26 and 0.50 (Sugiyono, 2010).

Table 7 Relationship between nutrition and the incidence of stomatitis in the Ranomeeto Health Center work area, South Konawe Regency

Nutrition	Stomatitis Occurrence				Total		ρ value (Ø)
	No		Yes				
	n	%	n	%	n	%	
Good	19	76.0	6	24.0	25	100	0,000 (0.490)
Not enough	11	25.6	32	74.4	43	100	
Total	**30**	**44.1**	**38**	**55.9**	**68**	**100**	

Table 7 shows that of the 68 respondents, 25 respondents had good nutrition and 43 respondents had poor nutrition. Of the 25 respondents who had good nutrition, there were 19 respondents (76.0%) who did not suffer from stomatitis and 6 respondents (24.0%) who suffered from stomatitis. Furthermore, of the 43 respondents who had poor nutrition, there were 11 respondents (25.6%) who did not suffer from stomatitis and 32 respondents (74.4%) who suffered from stomatitis.

Based on the results of statistical analysis using chi square, the value obtained is ρ = 0.000 (ρ < 0.05), so that H0 is rejected and Ha is accepted. This means that there is a relationship between nutrition or food containing vitamin C and the incidence of stomatitis in the Ranomeeto Community Health Center Working Area, South Konawe Regency, at the 95% confidence level (α = 0.05). The results of the correlation analysis obtained a phi coefficient of 0.490, where the magnitude of the phi correlation coefficient is categorized as moderate, namely between 0.26 and 0.50 (Sugiyono, 2010).

Table 8 shows that of the 68 respondents, 32 experienced mild trauma, and 36 experienced severe trauma. Of the 32 respondents who experienced mild trauma, there were 23 respondents (71.9%) who did not suffer from stomatitis and 9 respondents (28.1%) who suffered from stomatitis. Furthermore, of the 36 respondents who experienced severe trauma, there were 7 respondents (19.4%) who did not suffer from stomatitis and 29 respondents

(80.6%) who suffered from stomatitis.

Table 8 Relationship between trauma and the incidence of stomatitis in the Ranomeeto Health Center work area, South Konawe Regency

Trauma	Stomatitis Occurrence				Total		ρ value (Ø)
	No		Yes				
	n	%	n	%	n	%	
Light	23	71.9	9	28.1	32	100	0,000 (0.527)
Heavy	7	19.4	29	80.6	36	100	
Total	**30**	**44.1**	**38**	**55.9**	**68**	**100**	

Based on the results of statistical analysis using chi square, the value obtained is ρ = 0.000 (ρ < 0.05), so that H0 is rejected and Ha is accepted. This means that there is a relationship between trauma and the incidence of stomatitis in the Ranomeeto Community Health Center Working Area, South Konawe Regency, at the 95% confidence level (α = 0.05). The results of the correlation analysis obtained a phi coefficient of 0.527, where the magnitude of the phi correlation coefficient is categorized as strong, namely between 0.51 and 0.75 (Sugiyono, 2010).

Discussion
The Relationship between Oral Hygiene and the Occurrence of Stomatitis
The research results showed that the majority of respondents had good oral hygiene, namely 35 people (51.5%). This is because, on average, the patient already understands the oral hygiene they are doing and applies these oral hygiene procedures in their daily lives, even though not all categories of oral hygiene are carried out by the patient. Also, the average patient already understands dental diseases. and mouth problems that will occur if they do not practice oral hygiene in everyday life, but there are also patients who are unaware of the impacts that will occur if oral hygiene behavior is not carried out.
The results of this research are in line with Anindayudina's (2018) research that the majority of respondents in the Edelweis Room at Ulin Hospital Banjarmasin had good oral hygiene behavior, numbering 39 (54.2%). Oral hygiene behavior includes tooth brushing behavior, mouth rinsing behavior, using tools such as toothpicks, and dealing with dental and oral complaints.

Regular oral hygiene is more important for preventing or reducing stomatitis. Oral hygiene is very often neglected in nursing interventions. The quality, frequency, and consistency of oral care are the most important factors in preventing stomatitis; therefore, the role of nurses also has an important role and is responsible for increasing efforts to prevent stomatitis. Nurses have a position of support and stimulation for patients through providing education. The research results showed that there were 14 (40.0%) respondents who had good oral hygiene behavior but still experienced stomatitis. This is thought to be caused by a lack of nutrition or consumption of foods containing vitamin C as well as poor tooth brushing techniques, where there are still many respondents who brush their teeth so hard that they accidentally touch their gums, causing stomatitis.

The research results showed that there were 9 (27.3%) respondents who had poor oral hygiene behavior but did not suffer from stomatitis. This was due to adequate nutrition or

good consumption of vitamin C and the absence of trauma that occurred in the mouth, causing the respondents not to experience stomatitis. Apart from that, adequate oral hygiene behavior is still balanced compared to good behavior but does not have stomatitis, but there are also some patients with adequate to good behavior but have stomatitis. In this case, the patient not only has adequate oral hygiene behavior but also must have good oral hygiene. which is good, and even though the patient has good oral hygiene behavior but has face stomatitis, he must carry out oral hygiene every day for a known time, namely twice a day without missing anything, in order to minimize the worsening of stomatitis and prevent stomatitis and dental disease. and other mouths in order to improve the level of dental and oral health and to know about carrying out better oral hygiene if dental and oral diseases occur, especially stomatitis, or in daily activities.

The results of this research are in line with research conducted by Anindayudina (2018), who found that there is a relationship between oral hygiene behavior and the incidence of stomatitis in chemotherapy patients in the Edelweis Room at Ulin Hospital, Banjarmasin. The Kendall Tau correlation result was -0.395, indicating that the direction of the correlation is negative. The results of this study are also in line with Carlton G. Brown's (2015) finding that there is a relationship between tooth brushing behavior and the incidence of stomatitis in chemotherapy patients because it reduces the occurrence of stomatitis and accelerates the healing of stomatitis.

Relationship between nutrition and the incidence of stomatitis
The research results showed that the majority of respondents had poor nutrition or did not consume enough food containing vitamin C, namely 43 people (63.2%). Thrush can attack the mucous membranes of the inner cheeks, inner lips, tongue, gums, and the roof of the oral cavity. SAR is classified as an ulcer which is an open wound of the skin or mucosal tissue that shows gradual tissue disintegration and necrosis, usually in the form of white to yellowish spots, either singly or in groups. This disease is very disturbing for sufferers, because this disease manifests in the oral cavity which can interfere with masticatory function. So it is not uncommon for sufferers who experience this disease to have a reduced appetite and nutritional intake for the body is also reduced due to a lack of vitamin C, vitamin B1, vitamin B2 and iron.

The results showed that there were 6 (24.0%) respondents who had good nutrition but suffered from stomatitis. This was due to poor oral hygiene behavior carried out by the respondents, apart from trauma that had occurred in the oral cavity due to being hit by a toothbrush while brushing teeth and accidentally biting certain parts of the oral mucosa. There were also 11 respondents (25.6%) who had poor nutrition, but did not suffer from stomatitis. This is because the respondents' immune system is quite good and their oral hygiene behavior is very good. Apart from that, nutritional intake through iron is quite good, where iron in the body is needed to repair damaged cells, especially epithelial cells in the mouth and lips.

The results of this research are in line with research conducted by Darmanta (2013), it was found that the factors that most trigger the occurrence of stomatitis are trauma, stress and lack of consuming foods containing vitamin C. Meanwhile, research by Rahmayani (2016) related to nutrition found that there is a relationship between eating patterns. with the incidence of

stomatitis, namely eating foods that are deficient in vitamin C, vitamin B1, vitamin B2, iron and foods that have a sharp texture can accelerate the occurrence of membrane injuries in the oral cavity.

Various snacks such as food served cold, hot and oily can result in health problems such as allergies. Allergies to several foods such as nuts, chocolate, french fries, cheese, milk, wheat, wheat, coffee, cereals, almonds, strawberries and some tomato foods are associated with the appearance of stomatitis in some patients. Apart from that, hot food containing chemicals is also thought to cause irritation in the mouth area when consumed carelessly as a result of this inflammation causing germs to spread to the tonsil area (Darmanta, 2013).

Allergies to several foods such as nuts, chocolate, french fries, cheese, milk, wheat, wheat, coffee, cereals, almonds, strawberries and some tomato foods are associated with the appearance of SAR in some patients. The patient experienced itching on his oral mucosa and then developed lesions suspected to be SAR after consuming fish. It is estimated that the sample had an allergy to fish which caused an itchy sensation in the oral cavity after eating fish, causing the oral mucosa to become injured. These wounds are thought to develop into SAR lesions in the oral cavity, but no literature or research results have been found that suggest that fish can trigger SAR lesions (Yogasedana, 2014).

Loss of water and electrolytes, dehydration occurs which results in acid-base balance disorders (metabolic acidosis, hypokalemia). There is a significant relationship between drinking water and a history of recurrent aphthous stomatitis (SAR). The incidence of SAR due to insufficient consumption of water is many times greater than the prevalence of SAR due to consumption of sufficient water (Widyastutik, 2017).

Relationship between trauma and the incidence of stomatitis
The research results showed that the majority of respondents experienced severe trauma, namely 36 people (52.9%). The trauma referred to in this study is a bite or impact on the oral mucosa, which is a trigger factor for stomatitis. Indirectly, oral hygiene can influence the appearance of stomatitis. Maintaining oral hygiene is one way to prevent oral diseases. Although the etiology of stomatitis cannot be ascertained, it can occur because the bacteria in the mouth when brushing teeth are not completely clean. Recommendations from the International Dental Federation say that you should brush your teeth twice a day, in the morning and evening.
The results of statistical analysis show that there is a relationship between trauma and the incidence of stomatitis in the Ranomeeto Community Health Center Working Area, South Konawe Regency, with a correlation value obtained with a phi coefficient of 0.527, where the magnitude of the phi correlation coefficient is categorized as strong. The results of this study are also in line with research by Darmanta (2013), which found that 91.1% of respondents had experienced lesions suspected to be SAR and lesions that appeared after the respondents experienced trauma in their oral cavity. Trauma that is often experienced is trauma due to being hit by a toothbrush when brushing your teeth and accidentally biting certain parts of the oral mucosa.

Ulcers can form in areas where penetration wounds have occurred due to trauma. This opinion is supported by the results of clinical examinations, which explain that a group of

ulcers occur after minor trauma to the oral mucosa, such as brushing teeth or administering local anesthetic injections. Generally, ulcers occur due to biting while talking, bad habits, or chewing. due to dental care, food or drinks that are too hot, and toothbrushing. Trauma is not a factor associated with the development of stomatitis in all sufferers, but trauma can be considered a supporting factor (Masriadi, 2016).

The high incidence of stomatitis lesions is based on the etiological factor of trauma due to early symptoms such as bites and bumps, which seem to puncture the oral mucosa and are immediately accompanied by the appearance of ulcers in the traumatized area. The rapid process of ulceration from trauma to lesions was suspected to be stomatitis, which made the sample suspect that the etiological factor was trauma, which resulted in the appearance of the stomatitis lesions they experienced. It is also assumed that every time trauma occurs, it will cause injury. This further strengthens the assumption that the etiological factor is trauma, which causes the stomatitis experienced by this patient (Yogasedana, 2014).

Conclusion

Based on research in the Ranomeeto Community Health Center Working Area, South Konawe Regency, the conclusion that can be drawn is that there are varying relationships between certain factors and the incidence of stomatitis. Oral hygiene shows a moderate relationship, confirming the importance of oral hygiene in preventing stomatitis with a phi correlation coefficient of 0.329. Nutrition, especially intake of foods containing vitamin C, also shows a moderate relationship with stomatitis, illustrating the importance of nutrition in maintaining oral health with a phi correlation coefficient of 0.490. Meanwhile, trauma showed a strong association with stomatitis, emphasizing the importance of avoiding trauma to the mouth to prevent this condition, with a phi correlation coefficient of 0.527. This confirms that for effective prevention, attention to oral hygiene, nutrition, and prevention of trauma to the oral cavity is very important.

Conflict of Interests

There is no conflict of interest in this research.

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