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Research Report

Knowledge of xerostomia in the elderly in Rejosari Village, Lamongan Regency, East Java

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ABSTRACT

Background: Xerostomia, or dry mouth, is a subjective sensation often linked to hyposalivation, affecting oral and overall health. With a global prevalence of 5.5% to 46%, it is more common in the elderly due to factors like polypharmacy, systemic diseases, and age-related salivary gland changes. Xerostomia impacts daily activities such as speaking, chewing, and swallowing, reducing quality of life. Rejosari Village in Lamongan Regency, East Java, has a high elderly population and a well-established healthcare center for seniors (Posyandu Lansia), making it an ideal setting for studying awareness and knowledge of xerostomia. **Purpose:** To describe the level of knowledge of xerostomia among elderly people in Rejosari Village, Lamongan Regency, East Java. **Methods:** This descriptive observational study utilized an online questionnaire distributed via Google Forms. Participants were selected through consecutive sampling, focusing on elderly individuals who met the inclusion criteria. Of the 75 respondents who completed the questionnaire, 70 were included in the final analysis. Data were analyzed descriptively, categorizing knowledge levels into high, moderate, and low. **Results:** Among the 70 eligible respondents, 70.00% exhibited a high level of knowledge about xerostomia. Meanwhile, 22.86% were classified as having moderate knowledge, and 7.14% had low knowledge levels. These findings indicate that most elderly residents in Rejosari Village are well-informed about xerostomia, although knowledge gaps persist among certain groups. **Conclusion:** The elderly's knowledge about xerostomia in Rejosari Village, Lamongan Regency, East Java is dominated in the high knowledge category.

Keywords: human and well-being; elderly; xerostomia; knowledge; medicine; quality of life

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INTRODUCTION

The Indonesian Central Bureau of Statistics revealed that the structure of Indonesia's population is shifting towards an aging population.[1] A country is said to have an aging population if it has an elderly population of 7% and in 2017 the number of the elderly in Indonesia has reached 9%.[2] This research was conducted in Rejosari Village, Lamongan Regency, East Java. Based on the data from the website of the East Java Central Bureau of Statistics, the percentage of the elderly population in Lamongan Regency is quite high compared to other cities and regencies in East Java, namely 14.66% of the total population in 2020 of around 1.4 million residents. This demographic shift presents an urgent need to address the growing healthcare demands, particularly concerning conditions like xerostomia, which significantly impacts the quality of life for the elderly. One of the villages with a fairly high number of elderly people in Lamongan Regency is Rejosari Village which is located in Deket District. This village has an elderly primary healthcare center (Posyandu Lansia) program with currently around 80 members. The elderly primary health center in Rejosari village has received support from the authorities as evidenced by the budget obtained to maintain the elderly primary health center when other villages don't. The facilities provided for participants are therefore quite a lot. This also influences the growing enthusiasm of the elderly to participate in the activities of the elderly primary health care centers.

According to Government Regulations No. 43 of the Republic of Indonesia (2004), the elderly is those who are 60 years of age or older.[2] A person's lifestyle affects their health as they age. For example, eating sugary foods or barely doing exercise can be a risk factor for suffering from xerostomia at old age. In 2020, almost half of the elderly in Indonesia suffers health problems, both physically and

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mentally.[1] Aging is a gradual decrease in the functions and systems of the body's tissues and organs, including the oral cavity. One of the most common oral problems among the elderly is xerostomia.[3]

One study on the epidemiology of dry mouth stated that the prevalence of xerostomia was 23%, most common in the old age group.[4] It was also mentioned by Millsop et al.,[5] that xerostomia occurs in 5.5% to 46% of the world's population and commonly happens in the old age group. Xerostomia is defined as a subjective sensation of dry mouth and often associated with low salivary flow.[6] The occurrence of xerostomia is often followed by hyposalivation.[7]

Age can be a factor associated with xerostomia. Every year xerostomia cases increase by 1.01x.[7] The occurrence of xerostomia in the elderly can be caused by several factors, including systemic disease, consumption of drugs, psychological factors, menopause, radiation therapy, and smoking.[8,9] Xerostomia often causes subjective sensations that sufferers often complain of dry mouth, difficulty swallowing when eating, burning sensation of the oral mucosa, unpleasant sensations when tasting food, and bad breath.[7,10] These sensations will certainly affect the quality of life of the elderly who suffer from xerostomia. Patients with xerostomia may experience a range of psychological and physical discomfort, which affect their quality of life and often goes unnoticed until it significantly affects their daily lives, manifesting as symptoms such as anxiety, agitation, restlessness, hopelessness, and depression.[7,11]

Despite its prevalence, there is a research gap regarding the level of knowledge about xerostomia among elderly populations in rural areas, especially in Rejosari Village. This gap is critical as elderly individuals may not be aware of the condition, leading to untreated symptoms and a decrease in their quality of life. The problem statement of this study is that while xerostomia is widespread among the elderly, there is limited understanding of how well-informed the elderly in Rejosari Village are about the condition, which can hinder timely diagnosis and management. The aim of this study is to describe the level of knowledge about xerostomia among the elderly population in Rejosari Village, Lamongan Regency, East Java. This study is important due to the growing elderly population and the increasing prevalence of xerostomia, which affects their quality of life. The novelty lies in addressing the knowledge gaps in a rural Indonesian community, where limited research on xerostomia awareness among the elderly exists, providing insights for targeted healthcare interventions.

MATERIALS AND METHODS

This research used descriptive observational study to see the description of the knowledge about xerostomia in the elderly in Rejosari Village, Lamongan Regency, East Java using an online questionnaire distributed to the respondents. This study has received an ethical clearance certificate from Universitas Airlangga Faculty of Dental Medicine Health Research Ethical Clearance Commission under registered number 462/HRECC.FODM/VIII/2021. consent form, embedded in the survey, ensured all participants consented to participate in the survey. Participants gave implied consent by completing the survey, as clarified in the consent form.

The population in this study were members of the elderly primary healthcare center (Posyandu Lansia) in Rejosari Village, Lamongan Regency. The minimum number of samples in this study was calculated using a consecutive sampling technique with Slovin formula[12] calculations and the minimum number of samples required was 67 respondents. Meanwhile, this study got 70 respondents to complete the questionnaire. Informed consent was obtained via an embedded consent form

The data was collected through a Google form questionnaire which was distributed to the respondents and taken from September until November 2021. The questionnaire contained 20 questions which were divided into five domains, namely definition, symptoms, etiology and risk factors, diagnosis, and management of xerostomia. Respondents' answers were measured using the Guttman scale with the highest score of 1 and the lowest score of 0. Respondents' each correct answer getting a value of 1 and a wrong or no answer 0.

Data to classify elderly knowledge about xerostomia were analyzed using Microsoft Excel. Since this is a descriptive study, no inferential statistical tests were necessary. Descriptive statistics were applied to categorize knowledge levels into high, moderate, and low groups. The knowledge scores were analyzed to determine the distribution across these categories, and conclusions were drawn based on the frequency and percentage of respondents in each group.

RESULTS

The sociodemographic characteristic of the respondents is described in Table 1. The majority of respondents were female, with as many as 41 respondents (58.57%). Most of the respondents were 60–69 years old (81.43%). Numbers of respondents based on their educational background who did not attend school were 6 (8.57%), primary school were 59 (81.43%), senior high school were 2 (2.86%), and 3 respondents (4.28%) with a history of other education which consists of SPG (*Sekolah Pendidikan Guru*), PGSD (*Pendidikan Guru Sekolah Dasar*), and *Sekolah Rakyat.* There was no respondent with junior high school as their last education history.

The results of the study about the knowledge of the respondents on xerostomia based on the categories are presented in Table 2. The highest percentage was in the high knowledge category, which was 70.00% of the total respondents. While 22.86% of the total respondents are in moderate knowledge and 7.14% of the total respondents are in the low knowledge category.

Based on the questionnaires that have been distributed to the respondents, the distribution of respondents' answers is

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Table 1. Frequency distribution of sociodemographic characteristics

Categories		n	%
Gender	Male	29	41.43
	Female	41	58.57
Age	60–69	57	81.43
	70–79	9	12.85
	≥ 80 years old	4	5.72
Educational background	Didn't attend school	6	8.57
	Primary school	59	84.29
	Junior high school	-	-
	Senior high school	2	2.86%
	Other education (SPG, PGSD, Sekolah Rakyat)	3	4.28%

n = sample size.

Table 2. Respondents knowledge categories

Percentage	Total	Knowledge Category
7.14%	5	Low
22.86%	16	Moderate
70.00%	49	High
100%	70	Total

Table 3. Overall distribution of respondents score

Number	Domain	Questions	Answers			
			Correct		Incorrect	
			n	%	n	%
1	Definition	Dry mouth is a symptom that needs to be checked by a doctor.	64	91.42%	6	8.58%
2		Symptoms of dry mouth can occur due to old age.	60	85.71%	10	14.29%
3	Symptoms	Constant need to drink to help swallowing food is a symptom of dry mouth.	54	91.42%	6	8.58%
4		Alteration in taste when eating can be a symptom of a dry mouth.	61	87.14%	9	12.86%
5		Bad breath can be a sign of dry mouth.	60	85.71%	10	14.29%
6		A burning sensation on the tongue can be a sign of a dry mouth.	48	68.57%	22	31.43%
7	Etiology and risk factors	*Stress conditions experienced by the elderly do not affect dry mouth.	16	22.85%	54	77.15%
8		*Cigarette usage does not affect the occurrence of dry mouth.	26	37.14%	44	62.86%
9		A history of systemic diseases such as diabetes can be a possible cause of dry mouth.	67	95.71%	3	4.29%
10		Dry mouth could occur in individuals who frequently drinks coffee.	62	88.57%	8	11.43%
11		Undergo radiation therapy could have an impact on the mouth becoming dry.	60	85.71%	10	14.29%
12		Menopausal women are at risk for dry mouth.	55	78.57%	15	21.43%
13	Diagnosis	Dry mouth in the elderly is something that needs to be checked by a dentist.	54	81.42%	16	18.58%
14		Symptoms of dry mouth can be seen from the saliva that looks foamy.	66	94.28%	4	5.72%
15		Difficulty eating crispy and spicy foods could be a sign of dry mouth conditions.	63	90.00%	7	10.00%
16		Less saliva on the floor of the mouth can be a sign of dry mouth.	68	97.14%	2	2.86%
17	Treatments	Avoiding hot environments can prevent dry mouth.	57	81.42%	13	18.58
18		Chewing sugar-free gum could reduce the impact of dry mouth.	65	92.85%	5	7.15%
19		Consulting to find a drug substitute could be a way to manage dry mouth conditions if it may happen due to the drug	62	88.57%	8	11.43%
20		Quit/at least reduce smoking can help relieve dry mouth.	63	90%	7	10%

* = Statements with knowledge gaps due to their significantly higher percentage of incorrect answers compared to other statements;
n = sample size.

presented in Table 3. The score or percentage of respondents' answers in each question domain is in the high category with more than 50% of respondents answered correctly to the questions given. However, in the domain of etiology and risk factors, there were two questions respondents got very low scores because many respondents answered wrong, which were on questions number 7 and number 8.

DISCUSSION

Indonesia's elderly population is growing rapidly, with an estimated 30 million people aged 60 and over as of 2021. This number is expected to increase to over 60 million by 2050, as life expectancy in the country continues to rise. Rejosari Village in East Java, Indonesia has a significant elderly population, with 354 individuals over the age of 60, consisting of 184 males and 170 females. Despite this, only 80 of these individuals were registered members of the elderly primary healthcare center. This village was selected as the subject of a study focused on understanding the elderly population's knowledge of xerostomia, one of the most common medical conditions experienced by older adults. The study surveyed 70 individuals, with a majority of female respondents (41 out of 70). However, the study did not examine any correlation between gender and knowledge of xerostomia among the elderly population in Rejosari Village.

In this study, the sample was predominantly in the 60–69 age range, with fewer respondents in the older age groups. This distribution aligns with general demographic trends but does not specifically address how age correlates with knowledge of xerostomia. Although aging can impact cognitive functions, the relationship between age and xerostomia knowledge was not explored in this research.[13]

The educational background of respondents varied, with the majority having completed primary school, while fewer had attended other levels of education. A person's knowledge can be influenced by their level of education. Someone with a higher education level is expected to have broader knowledge.[14] However, the link between knowledge of xerostomia and educational level in the elderly was not examined in this study.

The level of knowledge investigated in this study only reached the first level of knowledge, "knowing". From the description of the questions for each domain, most of the respondents have high knowledge. The results reveal that most respondents have a high level of knowledge, indicating a generally strong understanding of the topic. It is certainly helpful to have an overview of respondents' knowledge to identify early signs of xerostomia symptoms occurring both in older adults themselves and dentists who have elderly patients. If detection and treatment related to xerostomia are handled early, it is expected that the impact of xerostomia will not interfere with the quality of life of the elderly who may experience it.

In evaluating knowledge of xerostomia across various domains, it is evident that respondents have a strong grasp of the definition of the condition. This question specifically addressed the fact that dry mouth is a symptom that requires evaluation by a medical professional. Xerostomia is defined as a subjective sensation due to decreased salivary flow rate (hyposalivation) and changes in saliva composition.[15] It is often accompanied by hyposalivation, which may go unnoticed by patients until they experience the oral discomfort associated with it. In elderly individuals, xerostomia can have a significant impact on quality of life, causing both physical and psychological discomfort. Therefore, it is important for dentists to diagnose and treat these conditions as early as possible.[7]

In addition to understanding the definition of xerostomia, the elderly population also demonstrated a high level of knowledge regarding its symptoms indicating that respondents recognized the constant need to drink in order to swallow food as a symptom of dry mouth. A study by de Carvalho et al.,[10] reported that one of the symptoms of xerostomia is a complaint of food swallowing difficulty and constant need of fluids or drinking water to swallow food. This decrease in salivary flow will cause the oral mucosa to become dry, thus affecting the ability to swallow in xerostomia patients.

In the third domain, knowledge based on etiology and risk factors revealed that question number 9 got the highest percentage of correct answers where respondents agreed that a history of systemic diseases such as diabetes can be a possible cause of dry mouth. The reason for decreased saliva production may be due to diabetes mellitus (DM), which causes consistent hyperglycaemia and oxidative stress that ultimately affects salivary secretion and flow.[16] However, it was also found that two questions were answered incorrectly by the majority of respondents: question number 7 on whether stress conditions experienced by the elderly affect dry mouth and question number 8 on whether cigarette usage affects the occurrence of dry mouth. This may happen possibly due to varying levels and durations of stress. Gholami et al.,[17] explained that different stress levels and durations of stress will affect body functions, one of it is salivary gland secretion. So, the authors assume that the respondents in this study may have a stress level that is not too high or have a duration of stress that is not too long to cause xerostomia. The relationship between stress and the occurrence of xerostomia can be seen in a study by Seangpraw et al.,[18] which explains that the elderly often experiences conditions of high-stress levels. Under stress conditions, cortisol levels in saliva will increase, causing hypofunction of the salivary glands. The non-stimulated salivary flow rate was lower in the high-stress group, although the differences were not significant.[19] The reason for the low percentage of correct answers to question number 8 may be because there were more female respondents than male, and smoking is typically more common among males. This is in line with the research conducted by Pedersen et al.,[20]which stated that the proportion of daily smokers is significantly higher in males than females. Their study also explained that smokers have worse oral health than non-smokers. Dental and oral health can also be influenced by socioeconomic

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and educational factors. Based on the percentage of recent educational history in this study, it is quite low, namely, more than 50% of respondent's educational background is primary school. So, the authors assume that the low score of correct answers on the etiology questions and risk factors for xerostomia in the form of smoking can be caused by the percentage of female respondents being higher than males, socioeconomic factors, and education history of respondents. The effect of smoking on the occurrence of xerostomia can be caused by the nicotine content contained in cigarettes which can be a predisposing factor for structural and functional changes in the salivary glands so that it will interfere with the salivary flow rate and changes in salivary pH.[21] In addition to nicotine levels, the heat of the cigarettes being exposed to the oral cavity for a long time can stimulate damage to the salivary glands, and results in decreased salivary function Thus, the oral cavity will become drier.[22]

In the fourth domain, namely, knowledge based on diagnosis of xerostomia, the majority of respondents answered correctly, especially on number 16, which they agree that less saliva on the floor of the mouth can be a sign of dry mouth. According to a study by Assy et al.,[23] it is said that on intra-oral examination of patients with xerostomia often exhibit reduced saliva in the floor of their mouth.

In the fifth domain, namely, knowledge based on treatment of xerostomia found that question number 18 got the highest percentage of correct answers, where respondents agreed chewing sugar-free gum could reduce the impact of dry mouth. A study conducted by Kaee et al.,[24] found that xerostomia patients showed a self-rated improvement regarding their xerostomia complaints and improved oral well-being after being subjected to the study chewing gum. The effect of xylitol gum or sugar-free gum itself has also been recommended as a xerostomia therapy because it can stimulate the production of saliva in the oral cavity.

The majority of respondents in the research gave incorrect answers to questions 7 and 8 in the etiology and risk factors domain, which may be due to their lack of awareness about various risk factors for xerostomia. It has been challenging for the elderly, as well as common people, to understand the etiology and risk factors of xerostomia. Hence, it is crucial to raise awareness among the elderly about xerostomia to improve their knowledge, prevent the symptoms from worsening, and help them become more conscious about it.

Despite the significant knowledge gaps identified in the etiology and risk factors of xerostomia, the overall knowledge level among the elderly in Rejosari Village, Lamongan Regency, East Java is predominantly in the high knowledge category. This indicates that while there are areas needing improvement, many elderly individuals have a strong understanding of xerostomia. However, this study has limitations, including the lack of exploration into the relationship between knowledge levels and variables such as educational background and gender. Future studies could address these factors to provide a more comprehensive understanding of the knowledge about xerostomia in the elderly population.

However, the research has its limitations, as there is no established relationship between the level of knowledge and educational background of the respondents. While the elderly have good knowledge of xerostomia, there is a need for further studies to explore the educational background-related differences in the level of knowledge of xerostomia in the elderly to draw a more generalized conclusion. Future research should also investigate other potential factors, such as age, gender, and socio-economic status, to determine their impact on xerostomia knowledge, which could help tailor more effective interventions and awareness programs for the elderly.

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