E-ISSN: 22502-0412

JDS

Journal of Syiah Kuala Dentistry Society

Vol 9 No. 2, December 2024

PUBLISHER FKG USK PRESS

JDS Journal of Syiah Kuala Dentistry Society
PUBLISHER FKG USK PRESS
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JDS (Journal of Syiah Kuala Dentistry Society) Phone: +62 651-7555183 Email: jds.fkg@usk.ac.id

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Vol 10, No 1 (2025)

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ORIGINAL RESEARCH
E-ISSN: 2502-0412
Vol. 10 (1) 1–8. June 2025
DOI Prefix: Prefix 10.24815

Prevalence of Elderly with Oral Complaints Accompanied by Symptoms of Osteoporosis in Jakarta, Indonesia

Anggraeny Putri Sekar Palupi,[1] Aurellia Sophie Adisa [2]

[1] Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, Universitas Trisakti, Jakarta, Indonesia
[2] Undergraduate student, Faculty of Dentistry, Universitas Trisakti, Jakarta, Indonesia

Corresponding Author: anggraeny@trisakti.ac.id

ARTICLE INFO : Received, January 11, 2025; Revised, March 4, 2025; Accepted, May 22, 2025; Published, June 25, 2025
ORCID : Palupi APS (0000-0002-5128-9604)
DOI : 10.24815/jds.v10i1.47877

ABSTRACT

Background: Aging is a natural physiological process characterized by a decline in physical, cognitive, and psychomotor functions. These changes can lead to a weakened immune system, making the elderly more vulnerable to various diseases, including osteoporosis, a degenerative condition commonly associated with aging and influenced by multiple factors. Additionally, aging affects oral function, leading to difficulties with mastication and a reduction in nutritional intake. Oral and dental health play a crucial role in maintaining overall health, and inadequate oral care can harm systemic health. **Objective:** This study aimed to determine the prevalence of elderly individuals with symptoms of osteoporosis and oral health complaints in Central Jakarta. **Method:** A cross-sectional study was conducted using a structured questionnaire administered to 35 elderly respondents. The collected data were statistically analyzed and presented in the form of a frequency distribution table. **Results:** The findings revealed that 15% of the respondents exhibited symptoms of osteoporosis. Additionally, 13% of the elderly experienced oral health complaints that coincided with the symptoms of osteoporosis. **Conclusion:** The study highlights a notable prevalence of osteoporosis symptoms and associated oral health complaints among the elderly in Central Jakarta. These findings underscore the importance of developing integrated health strategies that address both systemic and oral health needs in the elderly population.

Keywords: Elderly; Osteoporosis; Oral health; Prevalence; Aging; Central Jakarta; Cross-sectional study

1. Introduction

Osteoporosis is a problem that is often shared by most people around the world, especially in developing countries. Osteoporosis can affect more than 50% of individuals aged over 75-80 years. About 80% of people with osteoporosis are women.[1] The World Health Organization (WHO) states that in the world, there are approximately 200 million people who have osteoporosis. Symptoms of osteoporosis are not specific, including pain in the bones and muscles, bone fractures, an increasingly bent posture of the spine, back pain, and a decrease in height.[2] A sharp decrease in bone density that occurs several years after women experience menopause can trigger osteoporosis.[3] Women experience osteoporosis more often than men. The effect of decreasing the hormone estrogen in women since the age of 35 years, while the hormone testosterone in men decreases starting at the age of 65 years.[4]

Osteoporosis is prone to attack individuals aged over 50 years. Osteoporosis in Indonesia affects one in three women and one in five men, leading to an increased risk of osteoporotic fractures.[5] The five factors that trigger osteoporosis are age, lifestyle, physical activity, gender, hormones, smoking, genetic factors, and body weight. Local factors such as bacterial plaque and calculus may also mask the effects of osteoporosis on the periodontal status. Low bone density can also compromise the primary stability of oral implants. An imbalance in the bone remodeling process can lead to a loss of bone density throughout the body, including the oral cavity, as the oral cavity is more susceptible to bacterial infection.[6]

Periodontal disease is not like osteoporosis, as periodontal disease is a localized inflammatory response to bacteria in the mouth that can lead to alveolar bone loss. Oral complaints are common in postmenopausal women, including tooth loss and periodontal disease, and their prevalence increases with age. The correlation between osteoporosis and periodontal disease is complex because both are

multifactorial diseases.[7] The elderly or elderly are those aged over 60 years, as stated in Law Number 13 of 1998 concerning Elderly prosperity.[8] Based on data from the Jakarta Open Data (2019), the number of elderly in DKI Jakarta outside the Thousand Islands is 987,063 elderly.[9] The physical condition of older people will decrease due to the aging process, decreased appetite, reduced number of teeth, and decreased strength of the masticatory muscles.[10] A reduced number of teeth can cause problems or disturbances in the main functions of the teeth, namely mastication, aesthetics, and phonetics.[11]

Complications in osteoporosis patients, especially smokers, are more prone to experiencing post-extraction dry sockets, which can delay the healing process. [12] Gradual physiological declines can lead to decreased daily activities. The functions of the mouth are also affected, such as salivary secretion, which can result in dry mouth and tooth loss, directly impacting the strength of chewing and swallowing.[13] Oral complaints that are often found in the elderly are tooth loss, caries, periodontal disease, and tooth wear, which results in impaired chewing ability, which is reduced in the elderly, thereby affecting diet and nutritional intake and can affect general health.[14] The main oral health problems in the elderly are dry mouth and Dental caries caused by reduced salivary flow.[14] Based on the description above, the researcher is interested in conducting a study to determine the prevalence of elderly with osteoporosis symptoms and to determine the prevalence of elderly with oral complaints accompanied by osteoporosis symptoms in Central Jakarta.

2. Materials and Methods

Research Design

This study employs a quantitative descriptive research design, utilizing a cross-sectional approach, and is conducted by distributing structured questionnaires both online and offline to respondents.

Population and Sample

The study population consisted of elderly individuals aged 60 to 85 years living in Central Jakarta. Based on the total number of elderly people in DKI Jakarta in 2019, which was 987,063, the sample size for Central Jakarta was determined using the Slovin formula, resulting in a minimum required sample size of 30 respondents. A total of 35 elderly participants were included in this study. The random sampling technique was used to select participants.

Inclusion and Exclusion Criteria

Inclusion criteria: Elderly men and women aged 60–85 years, not illiterate, able to use a mobile phone or laptop (or at least assisted by a companion), in an active physical condition, able to perform daily activities, and residing in Central Jakarta. Exclusion criteria: Elderly individuals who were unable to communicate actively. Data Collection Procedure: Questionnaires were distributed directly and electronically. The instruments used were tested for validity and reliability before use. Data collection was conducted under ethical approval obtained from the research ethics committee.

Data Analysis

The collected data were first analyzed univariately and then processed using statistical analysis to assess the distribution of osteoporosis symptoms and oral health complaints. The results were organized into a frequency distribution table and presented in a descriptive manner.

3. Result and Discussion

This study aimed to investigate the prevalence of osteoporosis symptoms and oral health complaints among the elderly population in Central Jakarta. A total of 35 respondents, aged between 60 and 85 years, participated in the survey. The data collected through questionnaires were analyzed descriptively and presented in tabular form to identify the frequency distribution of various indicators related to osteoporosis risk, systemic health conditions, long-term medication use, oral health problems, and cognitive complaints. The results of this study reveal several important findings regarding the health status of the elderly, particularly concerning osteoporosis and oral health. Most respondents demonstrated relatively healthy lifestyles, characterized by engaging in physical activity and avoiding smoking and excessive alcohol consumption. However, a subset of participants

exhibited key risk factors for osteoporosis, including the presence of chronic diseases like diabetes and the use of long-term medications known to affect bone metabolism.

Oral health conditions were also evaluated, and although the majority of respondents reported minimal issues such as tooth pain or sensitivity, a significant portion had experienced tooth loss or damage. These dental conditions, along with nutritional deficiencies and aging-related changes, may contribute to reduced mastication ability, which in turn affects overall nutritional intake and quality of life. The findings also suggest that oral health and systemic health are interconnected, especially in older adults. Reduced cognitive function, as indicated by occasional forgetfulness, further highlights the importance of comprehensive geriatric care that integrates both dental and general health services. These results underscore the importance of raising awareness and implementing preventive interventions to address osteoporosis and oral health management among the elderly. Public health strategies should aim to promote regular health screening, adequate nutrition (including calcium and vitamin D), and accessible dental care to support healthy aging.

Table 1 presents the distribution of respondents based on self-reported risk factors for osteoporosis. The majority of respondents (77.1%) reported no history of bone fractures after the age of 50. Additionally, 65.7% did not have a habit of consuming alcohol or smoking more than three units per day. A significant portion (91.4%) indicated that their parents had no history of fractures, suggesting a low familial predisposition. Furthermore, 77.1% of respondents engaged in physical activity for more than 30 minutes per day. These findings suggest that most elderly participants maintained relatively healthy lifestyles, which could potentially reduce their risk of developing osteoporosis.

Table 1. Frequency Distribution of Respondent Characteristics Based on Osteoporosis Risk Factors

Characteristics	Category	Frequence	Prevalence
History of bone fracture over 50 years	Yes	8	22,9
	No	27	77,1
	Total	35	100%
Bad habit of consuming alcohol and/or smoking (more than 3 units per day)	Yes	12	34,3
	No	23	65,7
	Total	35	100%
History of bone fractures experienced by parents	Yes	3	8,6
	No	32	91,4
	Total	35	100%
Daily physical activity is less than 30 minutes per day	Yes	8	22,9
	No	27	77,1
	Total	35	100%

Data Processing, 2025

Table 2 illustrates the height distribution of the elderly respondents. The two most common height ranges were 155–159 cm and 160–164 cm, each accounting for 28.6% (10 individuals) of the sample. This suggests that the majority of respondents fall within the average height range typical of the Indonesian elderly population, which may have implications for their nutritional status and musculoskeletal health.

Table 2. Frequency Distribution of Respondent Characteristics Based on Height

Height	Frequence	Prevalence
140 cm - 144 cm	1	2,9
145 cm - 149 cm	2	5,7
150 cm - 154 cm	7	20
155 cm - 159 cm	10	28,6

Height	Frequence	Prevalence
160 cm - 164 cm	10	28,6
165 cm - 170 cm	5	14,3
Total	35	100%

Data Processing, 2025

Table 3 presents the types of systemic diseases reported by respondents that are associated with an increased risk of osteoporosis. Nearly half of the participants (45.7%) reported no systemic diseases. Among those who did, diabetes was the most prevalent (17.1%), followed by rheumatoid arthritis (11.4%). Digestive and pulmonary diseases each affected 8.6% of respondents. Additionally, 2.9% of participants reported thyroid disorders, early menopause, and prolonged immobility, respectively. These conditions are known contributors to reduced bone mineral density, highlighting the need for integrated medical care among the elderly.

Table 3. Characteristic Frequency Distribution

Systemic Disease	Frequence	Prevalence
Rheumatoid Arthritis	4	11,4
Gastrointestinal Diseases	3	8,6
Breast / Prostate Cancer	0	0
Diabetes	6	17,1
Chronic Kidney Disease	0	0
Lung Disease	3	8,6
Thyroid Disease	1	2,9
Low Testosterone levels	0	0
Early Menopause	1	2,9
Cannot Move Long Period	1	2,9
HIV	0	0
None	16	45,7
Unknown	0	0
Total	35	100%

Data Processing, 2025

Table 4 outlines the long-term use of medications that may contribute to the development of osteoporosis. A majority of respondents (80%) reported not taking any medications on a long-term basis. However, 11.4% were taking diabetes medications, 5.7% were on corticosteroids, and 2.9% were using immunosuppressants. Although the number of respondents using high-risk medications was relatively low, these findings point to the importance of medication monitoring in osteoporosis prevention strategies among the elderly.

Table 4. Frequency Distribution of Respondent Characteristics Based on Medicines Consumed in the Long Term

Drugs	Frequence	Prevalence
Corticosteroids	2	5,7
Diabetic Medicine	4	11,4
Immunosuppressants	1	2,9
Antidepressant	0	0
Anticonvulsant	0	0
None	28	80

Drugs	Frequence	Prevalence
Unknown	0	0
Total	35	100%

Data Processing, 2025

Table 5 summarizes data on oral health status, nutritional intake, and cognitive complaints among elderly respondents. A total of 28.6% reported frequent consumption of calcium and vitamin D. Regarding oral symptoms, 42.9% had never experienced tooth pain, and 48.6% had never experienced tooth sensitivity. Additionally, 40% had no difficulty chewing, while another 40% sometimes experienced dry mouth. Cognitive function was assessed through questions on forgetfulness; 42.9% never felt forgetful, while 20% reported sometimes forgetting tasks. These findings suggest that a substantial proportion of respondents maintain both functional oral health and cognitive clarity in their daily lives.

Table 5. Frequency Distribution of Respondents' Characteristics Based on Consumption of Vitamins and Calcium, Complaints in the Oral Cavity, and Cognitive Function

Characteristics	Category	Frequence	Prevalence
Consume Calcium and Vitamin D	Very often	10	28,6
	Often	5	14,3
	Sometimes	9	25,7
	Seldom	5	14,3
	Never	6	17,1
	Total	35	100%
Pain in the teeth	Very often	4	11,4
	Often	1	2,9
	Sometimes	12	34,3
	Seldom	3	8,6
	Never	15	42,9
	Total	35	100%
Sensitive Teeth	Very often	3	8,6
	Often	3	8,6
	Sometimes	8	22,9
	Seldom	4	11,4
	Never	17	48,6
	Total	35	100%
Difficulty in chewing food	Very often	5	14,3
	Often	4	11,4
	Sometimes	6	17,1
	Seldom	6	17,1
	Never	14	40
	Total	35	100%
Dry taste in mouth	Very often	5	14,3
	Often	4	11,4
	Sometimes	14	40
	Seldom	4	11,4
	Never	8	22,9
	Total	35	100%

Characteristics	Category	Frequence	Prevalence
Easily forget what you want or are doing	Very often	5	14,3
	Often	3	8,6
	Sometimes	7	20
	Seldom	5	14,3
	Never	15	42,9
	Total	35	100%

Data Processing, 2025

Table 6 presents the dental condition of the respondents. More than half (54.3%) had lost nine or more teeth. In contrast, 17.1% had more than eight broken or missing teeth, while 34.3% reported having no broken or missing teeth. Regarding tooth mobility, 71.4% had no loose teeth, and 22.9% had fewer than two loose teeth. This suggests a noticeable degree of tooth loss among older people, although a substantial portion still retains a relatively stable dentition.

Table 6. Frequency Distribution of Respondent Characteristics Based on the Number of Teeth with Complaints

Characteristics	Category	Frequence	Prevalence
The number of teeth that are no longer in the oral cavity	None	0	0
	< 2 Tooth	4	11,4
	> 2 Tooth	4	11,4
	> 4 Tooth	8	22,9
	> 8 Tooth	19	54,3
	Total	35	100%
Number of broken or lost teeth	None	12	34,3
	< 2 Tooth	3	8,6
	> 2 Tooth	5	14,3
	> 4 Tooth	9	25,7
	> 8 Tooth	6	17,1
	Total	35	100%
Number of teeth that feel loose	None	25	71,4
	< 2 Tooth	8	22,9
	> 2 Tooth	1	2,9
	> 4 Tooth	1	2,9
	> 8 Tooth	0	0
	Total	35	100%

Data Processing, 2025

The results of this study, regarding the prevalence of elderly with oral cavity complaints accompanied by symptoms of osteoporosis in Central Jakarta with a total of 35 respondents, the frequency distribution of elderly women in Table 6 was 60% and 40% for men with a minimum age of 60 years and a maximum of 85 years and the average age of the respondents is 68.7 years. Several factors associated with an increased risk of osteoporosis-related bone fractures are generally associated with aging, as well as specific risk factors such as the use of drugs such as glucocorticoids which can cause bone loss, decreased bone quality, and impaired bone microarchitecture. Bone fractures can occur due to bones receiving excessive loads, falls, or as a result of daily activities.[15]

Bad habits such as consuming alcohol and/or smoking can increase the risk of osteoporosis because alcohol can cause decreased calcium levels in the bones due to reduced bone mass. Smoking can inhibit cells that function to form bone, such as osteoblasts. Individuals who engage in less

physical activity tend to experience muscle weakness and may reduce their peak bone mass, making them at risk of bone fractures.[4]

Factors that can cause osteoporosis include age, history of bone fractures, consumption of alcohol and smoking, inadequate intake of nutrients such as calcium and vitamin D, systemic diseases (diabetes, hormonal disorders, etc.), consumption of long-term drugs (steroids, hormone drugs, and others) can increase the risk of osteoporosis.[16] Not all elderly people with diabetes take diabetes medications; some antidiabetic drugs, such as thiazolidinediones, can hurt bone health and increase the risk of fractures. An increased risk of fracture occurs after taking antidiabetic drugs for at least one year.[17]

In the elderly, there is a decrease in pain intensity or an increase in pain threshold, which can be attributed to reduced innervation to the pulp compared to younger individuals. This reduction can be attributed to secondary and sclerotic dentine, which may lead to pulp necrosis in many elderly patients without any accompanying pain.[18] The elderly who carry out polymedication are the main triggers for dry mouth, especially due to the side effects of drugs.[19] Apart from being able to reduce the risk factors for osteoporosis, physical activity also has the potential to prevent and cure dementia, so that it can improve the quality of life of the elderly.[20]

4. Conclusion

This study demonstrates that the prevalence of osteoporosis symptoms among the elderly population in Central Jakarta is relatively low, with only 15% of respondents exhibiting indicative risk factors. Additionally, 13% of the respondents reported both osteoporosis symptoms and oral health complaints, emphasizing the potential interrelationship between systemic bone health and oral function in aging individuals. These findings underscore the importance of integrated healthcare approaches that address both musculoskeletal and oral health conditions in the elderly to prevent nutritional deficiencies and promote overall well-being in later life.

5. Limitations

Several limitations should be noted in this study. First, the sample size was relatively small (n = 35), which may limit the generalizability of the findings to the broader elderly population in Central Jakarta or Indonesia. Second, the use of self-reported questionnaires introduces the potential for recall bias and subjective interpretation of health status. Third, the cross-sectional design of the study does not allow for causal inferences between osteoporosis and oral health complaints. Future studies with larger sample sizes, clinical diagnoses, and longitudinal approaches are recommended to validate and expand upon these findings.

6. Acknowledgments

We want to express our deepest gratitude to our respondents for their invaluable patience and feedback in support of this research.

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Authors Contribution

Contribution	Palupi APS	Adisa AS.
Concepts or ideas	√	
Design	√	
Definition of intellectual content	√	
Literature search	√	√
Experimental studies	√	√
Data acquisition	√	√
Data analysis	√	√
Statistical analysis	√	√
Manuscript preparation	√	√
Manuscript editing	√	√
Manuscript review	√	√

Citation Format: Palupi APS, Adisa AS. Prevalence of elderly with oral Complaints accompanied by symptoms of osteoporosis in Central Jakarta. J Syiah Kuala Dent Soc. 2025; 10(1): 1–8.

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by Anggraeny Putri Sekar Palupi FKG

Submission date: 22-Jul-2025 09:29AM (UTC+0700)
Submission ID: 2718787575
File name: 47877-166858-2-PB_ANggraeny_Putri.pdf (306.99K)
Word count: 4052
Character count: 22004

JDS
Journal of Syiah Kuala Dentistry Society

https://jurnal.usk.ac.id/JDS

ORIGINAL RESEARCH
E-ISSN: 2502-0412
Vol. 10 (1) 1-8. June 2025
DOI Prefix: Prefix 10.24815

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Anggraeny Putri Sekar Palupi,[1] Aurellia Sophie Adisa [2]

[1] Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, Universitas Trisakti, Jakarta, Indonesia
[2] Undergraduate student, Faculty of Dentistry, Universitas Trisakti, Jakarta, Indonesia

Corresponding Author: anggraeny@trisakti.ac.id

ARTICLE INFO : Received, January 11, 2025; Revised, March 4, 2025; Accepted, May 22, 2025; Published, June 25, 2025
ORCID : Palupi APS (0000-0002-5128-9604)
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1. Introduction

Osteoporosis is a problem that is often shared by most people around the world, especially in developing countries. Osteoporosis can affect more than 50% of individuals aged over 75-80 years. About 80% of people with osteoporosis are women.[1] The World Health Organization (WHO) states that in the world, there are approximately 200 million people who have osteoporosis. Symptoms of osteoporosis are not specific, including pain in the bones and muscles, bone fractures, an increasingly bent posture of the spine, back pain, and a decrease in height.[2] A sharp decrease in bone density that occurs several years after women experience menopause can trigger osteoporosis.[3] Women experience osteoporosis more often than men. The effect of decreasing the hormone estrogen in women since the age of 35 years, while the hormone testosterone in men decreases starting at the age of 65 years.[4]

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This study employs a quantitative descriptive research design, utilizing a cross-sectional approach, and is conducted by distributing structured questionnaires both online and offline to respondents.

Population and Sample

The study population consisted of elderly individuals aged 60 to 85 years living in Central Jakarta. Based on the total number of elderly people in DKI Jakarta in 2019, which was 987,063, the sample size for Central Jakarta was determined using the Slovin formula, resulting in a minimum required sample size of 30 respondents. A total of 35 elderly participants were included in this study. The random sampling technique was used to select participants.

Inclusion and Exclusion Criteria

Inclusion criteria: Elderly men and women aged 60–85 years, not illiterate, able to use a mobile phone or laptop (or at least assisted by a companion), in an active physical condition, able to perform daily activities, and residing in Central Jakarta. Exclusion criteria: Elderly individuals who were unable to communicate actively. Data Collection Procedure: Questionnaires were distributed directly and electronically. The instruments used were tested for validity and reliability before use. Data collection was conducted under ethical approval obtained from the research ethics committee.

Data Analysis

The collected data were first analyzed univariately and then processed using statistical analysis to assess the distribution of osteoporosis symptoms and oral health complaints. The results were organized into a frequency distribution table and presented in a descriptive manner.

3. Result and Discussion

This study aimed to investigate the prevalence of osteoporosis symptoms and oral health complaints among the elderly population in Central Jakarta. A total of 35 respondents, aged between 60 and 85 years, participated in the survey. The data collected through questionnaires were analyzed descriptively and presented in tabular form to identify the frequency distribution of various indicators related to osteoporosis risk, systemic health conditions, long-term medication use, oral health problems, and cognitive complaints. The results of this study reveal several important findings regarding the health status of the elderly, particularly concerning osteoporosis and oral health. Most respondents demonstrated relatively healthy lifestyles, characterized by engaging in physical activity and avoiding smoking and excessive alcohol consumption. However, a subset of participants

exhibited key risk factors for osteoporosis, including the presence of chronic diseases like diabetes and the use of long-term medications known to affect bone metabolism.

Oral health conditions were also evaluated, and although the majority of respondents reported minimal issues such as tooth pain or sensitivity, a significant portion had experienced tooth loss or damage. These dental conditions, along with nutritional deficiencies and aging-related changes, may contribute to reduced mastication ability, which in turn affects overall nutritional intake and quality of life. The findings also suggest that oral health and systemic health are interconnected, especially in older adults. Reduced cognitive function, as indicated by occasional forgetfulness, further highlights the importance of comprehensive geriatric care that integrates both dental and general health services. These results underscore the importance of raising awareness and implementing preventive interventions to address osteoporosis and oral health management among the elderly. Public health strategies should aim to promote regular health screening, adequate nutrition (including calcium and vitamin D), and accessible dental care to support healthy aging.

Table 1 presents the distribution of respondents based on self-reported risk factors for osteoporosis. The majority of respondents (77.1%) reported no history of bone fractures after the age of 50. Additionally, 65.7% did not have a habit of consuming alcohol or smoking more than three units per day. A significant portion (91.4%) indicated that their parents had no history of fractures, suggesting a low familial predisposition. Furthermore, 77.1% of respondents engaged in physical activity for more than 30 minutes per day. These findings suggest that most elderly participants maintained relatively healthy lifestyles, which could potentially reduce their risk of developing osteoporosis.

Table 1. Frequency Distribution of Respondent Characteristics Based on Osteoporosis Risk Factors

Characteristics	Category	Frequence	Prevalence
History of bone fracture over 50 years	Yes	8	22,9
	No	27	77,1
	Total	35	100%
Bad habit of consuming alcohol and/or smoking (more than 3 units per day)	Yes	12	34,3
	No	23	65,7
	Total	35	100%
History of bone fractures experienced by parents	Yes	3	8,6
	No	32	91,4
	Total	35	100%
Daily physical activity is less than 30 minutes per day	Yes	8	22,9
	No	27	77,1
	Total	35	100%

Data Processing, 2025

Table 2 illustrates the height distribution of the elderly respondents. The two most common height ranges were 155–159 cm and 160–164 cm, each accounting for 28.6% (10 individuals) of the sample. This suggests that the majority of respondents fall within the average height range typical of the Indonesian elderly population, which may have implications for their nutritional status and musculoskeletal health.

Table 2. Frequency Distribution of Respondent Characteristics Based on Height

Height	Frequence	Prevalence
140 cm - 144 cm	1	2,9
145 cm - 149 cm	2	5,7
150 cm - 154 cm	7	20
155 cm - 159 cm	10	28,6

Height	Frequence	Prevalence
160 cm - 164 cm	10	28,6
165 cm - 170 cm	5	14,3
Total	35	100%

Data Processing, 2025

Table 3 presents the types of systemic diseases reported by respondents that are associated with an increased risk of osteoporosis. Nearly half of the participants (45.7%) reported no systemic diseases. Among those who did, diabetes was the most prevalent (17.1%), followed by rheumatoid arthritis (11.4%). Digestive and pulmonary diseases each affected 8.6% of respondents. Additionally, 2.9% of participants reported thyroid disorders, early menopause, and prolonged immobility, respectively. These conditions are known contributors to reduced bone mineral density, highlighting the need for integrated medical care among the elderly.

Table 3. Characteristic Frequency Distribution

Systemic Disease	Frequence	Prevalence
Rheumatoid Arthritis	4	11,4
Gastrointestinal Diseases	3	8,6
Breast / Prostate Cancer	0	0
Diabetes	6	17,1
Chronic Kidney Disease	0	0
Lung Disease	3	8,6
Thyroid Disease	1	2,9
Low Testosterone levels	0	0
Early Menopause	1	2,9
Cannot Move Long Period	1	2,9
HIV	0	0
None	16	45,7
Unknown	0	0
Total	35	100%

Data Processing, 2025

Table 4 outlines the long-term use of medications that may contribute to the development of osteoporosis. A majority of respondents (80%) reported not taking any medications on a long-term basis. However, 11.4% were taking diabetes medications, 5.7% were on corticosteroids, and 2.9% were using immunosuppressants. Although the number of respondents using high-risk medications was relatively low, these findings point to the importance of medication monitoring in osteoporosis prevention strategies among the elderly.

Table 4. Frequency Distribution of Respondent Characteristics Based on Medicines Consumed in the Long Term

Drugs	Frequence	Prevalence
Corticosteroids	2	5,7
Diabetic Medicine	4	11,4
Immunosuppressants	1	2,9
Antidepressant	0	0
Anticonvulsant	0	0
None	28	80

Drugs	Frequence	Prevalence
Unknown	0	0
Total	35	100%

Data Processing, 2025

Table 5 summarizes data on oral health status, nutritional intake, and cognitive complaints among elderly respondents. A total of 28.6% reported frequent consumption of calcium and vitamin D. Regarding oral symptoms, 42.9% had never experienced tooth pain, and 48.6% had never experienced tooth sensitivity. Additionally, 40% had no difficulty chewing, while another 40% sometimes experienced dry mouth. Cognitive function was assessed through questions on forgetfulness; 42.9% never felt forgetful, while 20% reported sometimes forgetting tasks. These findings suggest that a substantial proportion of respondents maintain both functional oral health and cognitive clarity in their daily lives.

Table 5. Frequency Distribution of Respondents' Characteristics Based on Consumption of Vitamins and Calcium, Complaints in the Oral Cavity, and Cognitive Function

Characteristics	Category	Frequence	Prevalence
Consume Calcium and Vitamin D	Very often	10	28,6
	Often	5	14,3
	Sometimes	9	25,7
	Seldom	5	14,3
	Never	6	17,1
	Total	35	100%
Pain in the teeth	Very often	4	11,4
	Often	1	2,9
	Sometimes	12	34,3
	Seldom	3	8,6
	Never	15	42,9
	Total	35	100%
Sensitive Teeth	Very often	3	8,6
	Often	3	8,6
	Sometimes	8	22,9
	Seldom	4	11,4
	Never	17	48,6
	Total	35	100%
Difficulty in chewing food	Very often	5	14,3
	Often	4	11,4
	Sometimes	6	17,1
	Seldom	6	17,1
	Never	14	40
	Total	35	100%
Dry taste in mouth	Very often	5	14,3
	Often	4	11,4
	Sometimes	14	40
	Seldom	4	11,4
	Never	8	22,9
	Total	35	100%

Characteristics	Category	Frequence	Prevalence
Easily forget what you want or are doing	Very often	5	14,3
	Often	3	8,6
	Sometimes	7	20
	Seldom	5	14,3
	Never	15	42,9
	Total	35	100%

Data Processing, 2025

Table 6 presents the dental condition of the respondents. More than half (54.3%) had lost nine or more teeth. In contrast, 17.1% had more than eight broken or missing teeth, while 34.3% reported having no broken or missing teeth. Regarding tooth mobility, 71.4% had no loose teeth, and 22.9% had fewer than two loose teeth. This suggests a noticeable degree of tooth loss among older people, although a substantial portion still retains a relatively stable dentition.

Table 6. Frequency Distribution of Respondent Characteristics Based on the Number of Teeth with Complaints

Characteristics	Category	Frequence	Prevalence
The number of teeth that are no longer in the oral cavity	None	0	0
	< 2 Tooth	4	11,4
	> 2 Tooth	4	11,4
	> 4 Tooth	8	22,9
	> 8 Tooth	19	54,3
	Total	35	100%
Number of broken or lost teeth	None	12	34,3
	< 2 Tooth	3	8,6
	> 2 Tooth	5	14,3
	> 4 Tooth	9	25,7
	> 8 Tooth	6	17,1
	Total	35	100%
Number of teeth that feel loose	None	25	71,4
	< 2 Tooth	8	22,9
	> 2 Tooth	1	2,9
	> 4 Tooth	1	2,9
	> 8 Tooth	0	0
	Total	35	100%

Data Processing, 2025

The results of this study, regarding the prevalence of elderly with oral cavity complaints accompanied by symptoms of osteoporosis in Central Jakarta with a total of 35 respondents, the frequency distribution of elderly women in Table 6 was 60% and 40% for men with a minimum age of 60 years and a maximum of 85 years and the average age of the respondents is 68.7 years. Several factors associated with an increased risk of osteoporosis-related bone fractures are generally associated with aging, as well as specific risk factors such as the use of drugs such as glucocorticoids which can cause bone loss, decreased bone quality, and impaired bone microarchitecture. Bone fractures can occur due to bones receiving excessive loads, falls, or as a result of daily activities.[15]

Bad habits such as consuming alcohol and/or smoking can increase the risk of osteoporosis because alcohol can cause decreased calcium levels in the bones due to reduced bone mass. Smoking can inhibit cells that function to form bone, such as osteoblasts. Individuals who engage in less

physical activity tend to experience muscle weakness and may reduce their peak bone mass, making them at risk of bone fractures.[4]

Factors that can cause osteoporosis include age, history of bone fractures, consumption of alcohol and smoking, inadequate intake of nutrients such as calcium and vitamin D, systemic diseases (diabetes, hormonal disorders, etc.), consumption of long-term drugs (steroids, hormone drugs, and others) can increase the risk of osteoporosis.[16] Not all elderly people with diabetes take diabetes medications; some antidiabetic drugs, such as thiazolidinediones, can hurt bone health and increase the risk of fractures. An increased risk of fracture occurs after taking antidiabetic drugs for at least one year.[17]

In the elderly, there is a decrease in pain intensity or an increase in pain threshold, which can be attributed to reduced innervation to the pulp compared to younger individuals. This reduction can be attributed to secondary and sclerotic dentine, which may lead to pulp necrosis in many elderly patients without any accompanying pain.[18] The elderly who carry out polymedication are the main triggers for dry mouth, especially due to the side effects of drugs.[19] Apart from being able to reduce the risk factors for osteoporosis, physical activity also has the potential to prevent and cure dementia, so that it can improve the quality of life of the elderly.[20]

4. Conclusion

This study demonstrates that the prevalence of osteoporosis symptoms among the elderly population in Central Jakarta is relatively low, with only 15% of respondents exhibiting indicative risk factors. Additionally, 13% of the respondents reported both osteoporosis symptoms and oral health complaints, emphasizing the potential interrelationship between systemic bone health and oral function in aging individuals. These findings underscore the importance of integrated healthcare approaches that address both musculoskeletal and oral health conditions in the elderly to prevent nutritional deficiencies and promote overall well-being in later life.

5. Limitations

Several limitations should be noted in this study. First, the sample size was relatively small (n = 35), which may limit the generalizability of the findings to the broader elderly population in Central Jakarta or Indonesia. Second, the use of self-reported questionnaires introduces the potential for recall bias and subjective interpretation of health status. Third, the cross-sectional design of the study does not allow for causal inferences between osteoporosis and oral health complaints. Future studies with larger sample sizes, clinical diagnoses, and longitudinal approaches are recommended to validate and expand upon these findings.

6. Acknowledgments

We want to express our deepest gratitude to our respondents for their invaluable patience and feedback in support of this research.

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Authors Contribution

Contribution	Palupi APS	Adisa AS.
Concepts or ideas	√	
Design	√	
Definition of intellectual content	√	
Literature search	√	√
Experimental studies	√	√
Data acquisition	√	√
Data analysis	√	√
Statistical analysis	√	√
Manuscript preparation	√	√
Manuscript editing	√	√
Manuscript review	√	√

Citation Format: Palupi APS, Adisa AS. Prevalence of elderly with oral Complaints accompanied by symptoms of osteoporosis in Central Jakarta. J Syiah Kuala Dent Soc. 2025; 10(1): 1–8.

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