

Oral and Systemic Health Findings of Orofacial Susuk Users (Preliminary Study in Jakarta, Indonesia)

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Received 20 July 2025; 1st revision 6 March 2026; 2nd revision 15 April 2026; Accepted 16 April 2026;
Published online 27 April 2026

Keywords:

Susuk; DMF-T; Type 2
Diabetes; Hyperthyroid

ABSTRACT

Background: Susuk, or charm needles, are small metal talismans inserted subcutaneously, widely practiced in Southeast Asian countries, and believed to enhance beauty, charisma, and health. This study aimed to determine the demographics, quantity, and distribution of craniofacial susuk in Indonesian users, facial pain, dental caries (DMF-T), and systemic health findings.

Method: This descriptive, cross-sectional study analyzed outpatients at a West Jakarta hospital from January to June 2025. Patients referred for dental treatment who underwent routine radiological examinations (orthopantomography) were included. The length and diameter of the needles were calculated using a comparison formula. Data on age, gender, facial pain, DMF-T scores, and systemic health findings were recorded and processed using descriptive statistics.

Result: A total of 6 females and 2 males were using susuk with an average age of 65.125 ± 7.149 years consist of 3 females and 1 male had 1 susuk, 1 male and 2 females had 2 susuk, 1 female had 7 susuk. Orbicularis oris is the most common location of susuk, 1 female with Bell's Palsy was reported. Mean of DMF-T was 14.5 ± 6.1 ; Type 2 Diabetes was found in 5 users, hyperthyroid in 2 users; with other diseases such as joint inflammation and hypertension.

Conclusion: Orofacial susuk users were primarily elderly women presenting with a very high DMF-T index and multiple comorbidities suggesting a need for multidisciplinary health monitoring.

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doi: <http://dx.doi.org/10.30659/odj.13.1.34-42>

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Odonto : Dental Journal accredited as **Sinta 3 Journal** (<https://sinta.kemdikbud.go.id/journals/profile/3200>)

How to Cite: Lugito. Oral and Systemic Health Findings of Orofacial Susuk Users (Preliminary Study in Jakarta, Indonesia).

Odonto: Dental Journal, v.13, n.1, p.34-42, April 2026.

INTRODUCTION

Susuk, or also known as charm needle and pin, or talisman is a fine gold needle with pointed only on one side which inserted by the Shaman known as dukun subcutaneously in the face or other body parts.¹⁻⁴ Traditionally, the use of susuk has been practiced and sought in South East Asia countries especially in Malaysia, Indonesia, Brunei, and Singapore.^{1,3,5} Several reasons for using susuk are to be attractive, improve confidence, and protection.⁶

The diameter of susuk is 0.5-1 mm and the material of charm needles were gold alloys composed of *aurum* (85.2% - 88.6%), *cuprum* (9.3% - 10.8%) and trace elements of aluminium and *argentum*.^{1,7} Routine radiographic examination can reveal susuk accidentally and present as a radiopaque object.^{1,8,9} Differential diagnosis of susuk as a fine radiopaque object in the facial region may consist of unspecified particles due to post-trauma, root canal treatment substances for examples are broken file, obturation material gutta-percha, and silver point, dental pins or broken acupuncture needles.¹

Susuk are clinically invisible, unpalpable, and appear as distinct radiopaque objects on routine panoramic radiographs. The use of susuk can cause trauma and pain to users of complete dentures, neuralgia, potential damage to vital organs or penetration of neurovascular structures. While orofacial pain caused by susuk as localized side effects,⁶ at present, only few case reports, studies and literatures discuss about susuk.¹ Previous literatures focus on the mystical or localized pain aspects; there is no studies discuss about the oral and systemic health findings among susuk users and a total lack of data correlating these users with broader systemic comorbidities like Type 2 Diabetes or Hyperthyroidism. The objective of this study was to determine the gender, age, the quantities, and the distribution of susuk (charm needles) in the craniofacial areas according to orthopantomography features, facial pain, dental caries, and systemic health findings of orofacial susuk users in Indonesia.

RESEARCH METHOD

This study was a descriptive, cross-sectional study. All of outpatients in one of Hospital in West Jakarta, Indonesia from January to June 2025 who were referred for dental treatment and underwent routine radiological examinations were included. The concealed art of susuk was exposed by routine panoramic radiographic examination in the oral and maxillofacial region, reviewed and determined by oral and maxillofacial surgeon, oral medicine specialist and endodontist. This research has obtained ethical approval by the Research Ethics Committee Faculty of Medicine of Universitas Pelita Harapan under the number 229/K-LKJ/ETIK/VII/2025. The inclusion criteria were patients aged 20–80 years with indication of orthopantomograms examination, had not history of head trauma, beauty care, orthodontic and or orthognathic treatment. The exclusion criteria were as follows: orthopantomograms with lesions, trauma; a history of beauty care, orthodontic and or orthognathic treatment; and contra indication of radiologic exposures.

The length and diameter of susuk was calculated based on the comparison formula. The age, gender, facial pain, DMF-T, and systemic health findings were examined and recorded. Systemic health data and clinical diagnoses were obtained through a retrospective review of medical records, as established by specialists in endocrinology and neurology and confirmed during dental treatment. All the data were collected confidentially. The reasons for insertion were not asked and no susuk surgical removal was performed. Data is summarized and processed to be presented as a descriptive statistic to create a research report.

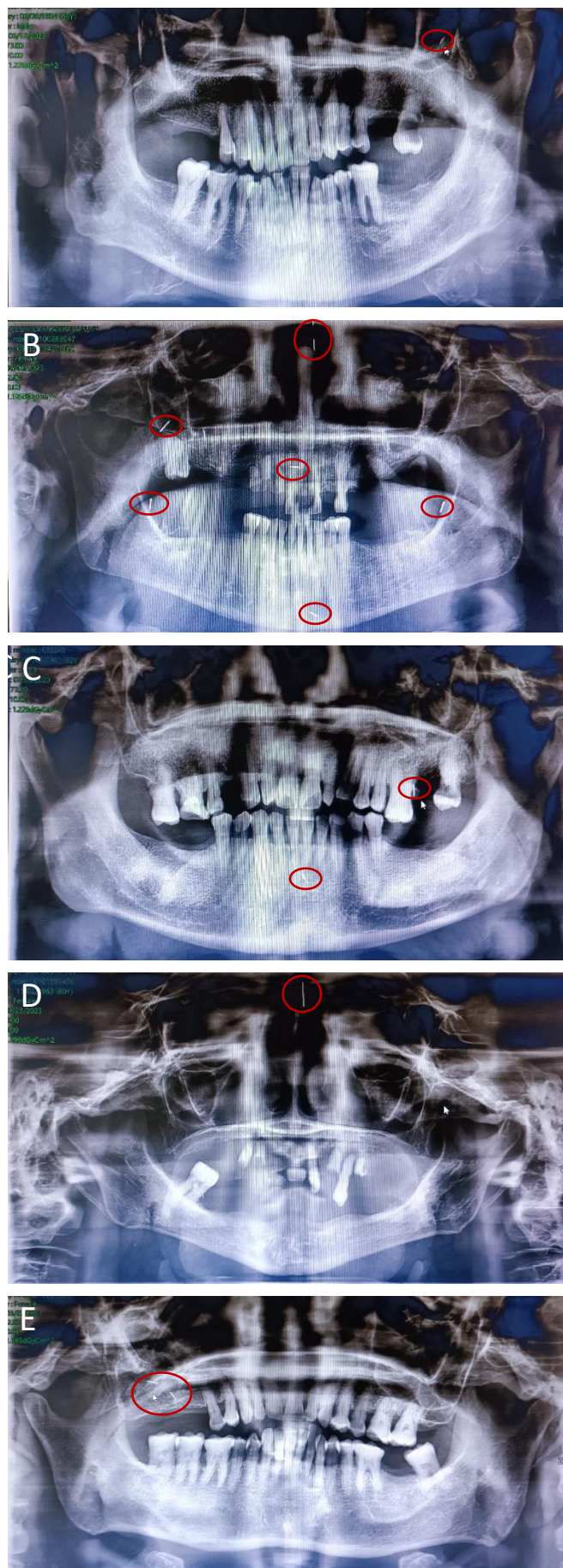
RESULTS

A total of 203 outpatients with 6 females and 2 males were using susuk with an average age of 65.125 ± 7.149 years consist of 3 females and 1 male had 1 susuk, 1 male and 2 females had 2 susuk, 1 female had 7 susuk (see table 1). Figure 1 (A–H) show panoramic radiograph results with susuk are shown as sharp and small radiopaque objects (red circles). Orbicularis oris is the most common location of susuk, one patient (no. 6) had Bell's Palsy on her left side, and no facial pain was reported (Figure 2). She was referred to a neurologist and ENT specialist for treatment of Bell's palsy. Mean of DMF-T was 14.5 ± 6.1 and classified as very high; Type 2 Diabetes was found in 5 users, hyperthyroid in 2 users; with other diseases such as joint inflammation and hypertension. All the patients never had an acupuncture treatment. The diameter of susuk in recent study range from 0.07 – 0.18 cm and length from 0.36 – 1.5 cm with average length x diameter is 0.6 x 0.11 cm.

Table 1. Oral findings and Systemic Health Findings of Charm Needles (Susuk) Users

No (Figure)	Gender	Age (years)	No. of susuk	Location (amount)/ Length x diameter (cm)	DMF-T	Systemic Health Findings	BMI
1(A)	Male	69	1	Zygomaticus Major Sinistra/1.5 x 0.11	8	Hypertension; NIDDM ¹ ; arthritis;	Obese 28.08
2(B)	Female	81	7	m. mentalis (1)/0.62 x 0.11 right zygomatic mayor (1)/ 0.55 x 0.07 m. orbicularis oris superior (1)/ 0.62 x 0.11 zygomaticus minor (2)/ 0.44 x 0.11 nasal (2) / 0.36 x 0.11	19	Hyperthyroid; NIDDM ¹ ; dyspepsia; hypertensive heart disease	Normal 23.33
3(C)	Male	62	2	m. orbicularis oris inferior (1)/ 0.47 x 0.07 m. masseter (1)/0.47 x 0.07	11	NIDDM ¹ ; fatty liver; CVD ²	Obese 31.27
4(D)	Female	60	1	Nasal/1 x 0.07	26	Spondylosis; low back pain	Normal 18.67
5(E)	Female	66	2	Right zygomaticus minor (2)/ 0.47 x 0.07	6	Chronic sinusitis	Obese 30.67
6(F)	Female	64	2	Mentalis bilateral (2)/ 0.73 x 0.15; 0.58 x 0.11	16	Hyperthyroid; Thyrotoxicosis; hypertension	Normal 20.78
7(G)	Female	55	1	Right m. orbicularis oris inferior (1)/0.73 x 0.18	12	Spondylosis; COPD ³ ; NIDDM ¹	Normal 21.92
8(H)	Female	64	1	Symphysis mandibula/ 0.44 x 0.18	18	NIDDM ¹ ; hypertension	Obese 28.44

Notes: ¹= non-insulin dependent diabetes mellitus; ²= cardiovascular disease; ³= chronic obstructive pulmonary disease



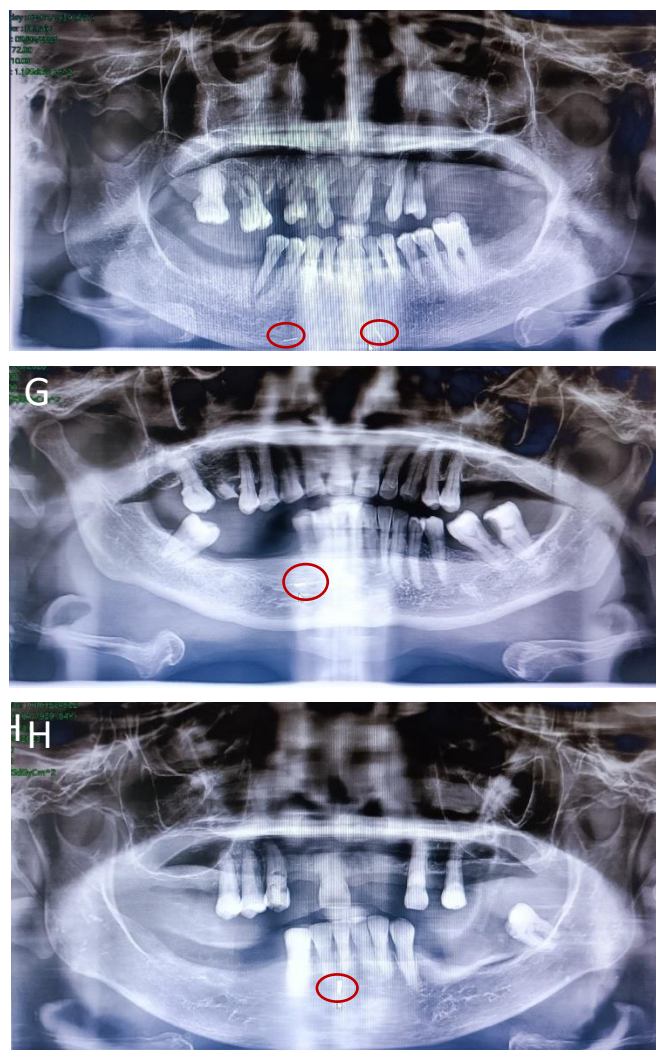


Figure 1. Based on order of susuk users in the table 1 (A-H) panoramic images depict one or several “susuk” (red circle).

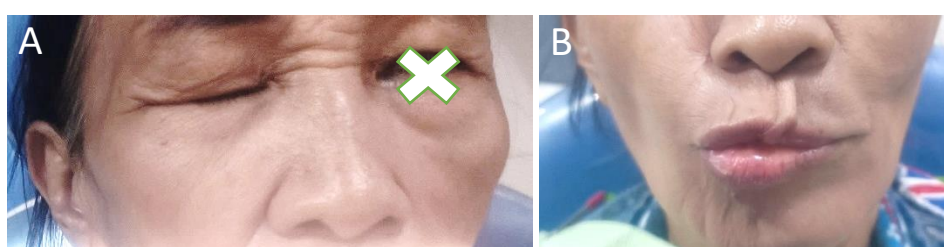


Figure 2. Clinical appearance of patient number 6 F. Grade V of facial nerve weakness based on the House-Brackmann Facial Nerve Grading System, unable to close left eye (A) and protruding left lips (B).

DISCUSSION

Susuk is an extraordinary needle which invisible and unpalpable clinically, and in its practice, women use more often than men.^{3,10} Due to personal reasons, we do not ask the reason for using susuk and because of prohibitions imposed by shamans or for fear of being ridiculed because of related to taboo matters. Therefore, most findings are incidentally revealed by radiographs performed for medical or dental examination and

treatment.^{6,10} The dentist should aware with presence of these practices and radiograph findings without the need for further examination and treatment.¹⁰

The high age (average 65.1 years) suggests these needles were likely inserted decades ago during the users' youth for beauty or charisma and have remained submerged since. To date, only a single study has documented patient demographics at the time of susuk identification via radiographic imaging. In that cohort of 33 individuals, ages ranged from 33 to 69 years, indicating a higher prevalence of this practice among older adult populations.¹¹ The predominant finding of susuk in geriatric populations is likely due to their increased medical surveillance and routine panoramic imaging compared to younger cohorts. Global literature confirms that older patients frequently exhibit poor oral health, characterized by a high prevalence of coronal and root caries, edentulousness, periodontal diseases, and oral mucosal lesions due to inadequate oral hygiene.¹²

The diameter of the susuk ranged from 0.44 to 0.51 mm (mean 0.47mm). The shortest needle was 5.38 mm, the longest 10.26 mm (mean 8.14 mm).⁷ On the contrary, the diameter of susuk in recent study range from 0.07 – 0.18 cm and length from 0.36 – 1.5 cm with average length x diameter is 0.6 x 0.11 cm. The basic material for susuk is generally made of gold, several silver and reinforced with copper).¹³ Other trace elements present in susuk are aluminium (Al), iron (Fe) and silicon (Si), each of which is less than 0.13%.^{7,8}

Gold extraction from ore using mercury is known as an amalgam by heating process, followed with distillation of mercury and produced isolated gold, along leaving 5% by mass of mercury. Gold shops will typically purchase the gold and refine it further to remove mercury, again through distillation. Gold sellers will usually purchase gold and refine it further to remove mercury.¹⁴ No literature showed the Shaman (dukun) used susuk which had been refined until no mercury remains, although the susuk which had been surgically removed, it did not contain mercury.^{7,8}

Other source of heavy metal contamination is probably from the silver amalgam teeth restorations consist of 50% mercury and detached gradually¹⁵ although no previous data in this study related to their tooth restoration contain of amalgam which had been lost previously. While susuk are primarily gold, they are often refined using mercury. Scientific literature suggests toxic heavy metals can trigger thyroid disorders and interfere with metabolic pathways.^{16,17}

Very high DMFT index in this study is thought to be caused by local, systemic, and other factors. Impairment and decline of physical and metabolism of body condition due to degenerative or pathologic processes, polypharmacy, and the high occurrence of chronic diseases in geriatric may manifest in inevitable oral disease.^{18,19} The incidence of dental caries, particularly root caries, has escalated in elderly populations.²⁰ Uncontrolled blood glucose level increased tooth loss possibility through periodontal disease and both seem to be link to each other and in a bidirectional relationship¹⁹ as seen in 5 participants. One of susuk users had metabolic syndrome consist of diabetes mellitus, hypertension, and cardiovascular diseases. The risk of metabolic syndrome escalates following the age and aging due to deterioration of organ function comprehensively and reduction of physical activities, so it stimulates decrease of metabolic rate.²⁰ The high DMF-T (14.5) to the high prevalence of Type 2 Diabetes (5 out of 8 users) need special precaution. Uncontrolled glucose levels, which explains the "very high" caries index is well known²¹ and found in this specific population although no statistical analysis was performed, therefore further research need to be performed.

Poor oral health might increase the risk of chronic systemic disease and malnutrition in the elderly¹⁹ although none of the susuk users in this study had malnutrition. No malnutrition of the susuk users allegedly

because selection of foods which can compromise the nutrition in meat, vegetables, and fruits difficult to be chewed. This result is in conjunction with study conducted by Koodaryan et al. indicated oral health and nutritional status of the elderly has no connection. The grade and characteristics of food influence the BMI, amount and frequency of food intake.¹⁹ Decrease of physical activities due to decline of metabolic rate and degenerative disease have relationship with obesity.²²

Hyperthyroidism (overactive) is a situation in which the thyroid produces and supplies excessive hormones to the body and increases metabolism.²³ Five susuk users suffered from NIDDM and one of them also experienced hyperthyroidism. Two possibilities are thought to explain this condition. Epidemiological and experimental researches concluded toxic heavy metals such as mercury, lead, cadmium, chromium, cuprum, zinc could cause a various type of thyroid disorders^{16,23,24} and environmental aspects are related with thyroid cancer has become the fifth most common cancer amongst women.²⁵

Most effects of toxic metals on the human thyroid remain assumed as a theoretical possibility. Mercury and another toxic metal (lead, iron, nickel, and silver) have been detected and suggested to be involved in thyroid disorders, but the distribution and prevalence of mercury in the human thyroid gland is unknown. Rates of mercury in autopsy-sampled thyroid, calculated by atomic absorption spectroscopy, were quintuple times higher in person with more than 11 occlusal mercury-containing amalgam restorations compared with less than four similar restorations. In parallel, mercury levels in autopsied thyroid samples, calculated by inductively coupled plasma mass spectrometry, correlated with the amount of dental amalgam surface present²⁴ and likewise with a similar hypothesis about susuk containing mercury.

The relationship between toxication of mercury (Hg) and thyroid hormones (THs) levels in the general population is debatable and has not yet established.^{3,17} Mercury can initiate pathways leading to genetic mutations, autoimmune reactions, and oxygen free radical production, mechanisms suspected to guide the pathogenesis of thyroid malignancies, autoimmune thyroiditis, and hypothyroidism.²⁴ Thyroid disease and diabetes mellitus can be interrelated and reciprocal. Thyroid disease has a high prevalence in cases of diabetes mellitus especially type 2 compared to type 1. Excessive circulating thyroid hormones in hyperthyroidism is related with uncontrolled serum glucose concentration, including hyperglycaemia and inadequate secretion of insulin resulting low level of a fasting C-peptide level which is less than or equal to 110% of the lower limit of normal laboratory measurement method. When hyperthyroidism progressed in individuals with normal plasma glucose, about 2–3% of them will develop overt diabetes, likewise with majority of Graves' disease.^{26,27}

Thyrotoxicosis can trigger and lead to diabetic ketoacidosis and endothelial dysfunction because of diabetic complications.²⁸ Endothelial dysfunction increases the risk of cardiovascular multimorbidity. Chronic, metabolic disease characterized by elevated levels of blood glucose influences thyroid diseases and thyroid function by altering the thyroid-stimulating hormone (TSH) level and interfering the conversion of thyroxine (T4) to triiodothyronine (T3) in the peripheral tissues. Insulin resistance and hyperinsulinemia in diabetes lead to thyroid cell proliferation, an increased incidence of thyroid nodules, and uninodular and multinodular goitre.²⁹ Previous case reports reported patients using susuk who experienced orofacial pain,⁶ whereas there has been no literature regarding Bell's palsy.

The accurate aetiology of Bell's palsy is still unknown and five main theories associated with the causes of BP including anatomical variations, viral infection, ischemia, inflammation, and low temperature stimulation.³⁰ Further examination and treatment including removal of susuk should be done to overcome possible causes of

Bell's Palsy. The limitation of this study was limited subjects in this study. Removal of susuk and examination of heavy metal content Mercury and other heavy metal levels in blood and other factors were also need to be considered (food, drinking water, make up etc). These factors may affect the findings.

CONCLUSION

Orofacial susuk users were primarily elderly women presenting with a very high DMF-T index and multiple comorbidities, suggesting a need for multidisciplinary health monitoring.

ACKNOWLEDGEMENT

Nil.

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