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Oral Health and Mobility Needs After Stroke: A Multidisciplinary Assessment Across Family Medicine, General Practice, Dentistry, and Physiotherapy

Rakan Osama M Kurdi[1*], Muhannad Alawi Alqahtani[2], Lujen Mohammed Alahmri[2], Maram Abdulqader Alsubhi[2], Alqasem Sultan Althagafi[2], Ashwaq Mesfer Alshahrani[3], Ibrahim Abdulrahman Almarawani[4], Abdulrahman Ali M Shukr[5], Abdullah Mohammad A Alrajeh[5], Ahmed I. Anbari[6]

[1]Dental Resident, Maternity & Children Hospital, King Abdullah Medical Complex, Saudi Arabia
[2]Physiotherapy, Khulais General Hospital, Saudi Arabia
[3]Family Medicine, Riyadh First Health Cluster, Saudi Arabia
[4]General Practice, Ministry of Health, Saudi Arabia
[5]General Practice, Health Surveillance Centre, Saudi Arabia
[6]Dentistry, Otoud PHC, Jazan Health Cluster, Saudi Arabia
[*]Corresponding author: Rakan Osama M Kurdi, ROKURDI@moh.gov.sa

ABSTRACT:

Background: Stroke frequently impairs motor, sensory and cognitive function, which may compromise oral self-care and access to dental services. This systematic review synthesized evidence on oral health status, functional and mobility limitations, and oral care interventions after stroke across family medicine, general practice, dentistry and physiotherapy settings.

Methods: Following PRISMA 2020, PubMed/MEDLINE, Embase, Scopus, Web of Science, CINAHL, Cochrane CENTRAL and ClinicalTrials.gov were searched from January 2009 to January 2026 for English-language randomized trials, cohort, case-control, cross-sectional and case-series studies in adults with stroke. Risk of bias was appraised with RoB 2 and Joanna Briggs Institute checklists, and certainty was graded with GRADE. Findings were synthesized narratively because clinical and methodological heterogeneity precluded meta-analysis.

Results: Fifteen studies from twelve countries or regions were included: five randomized trials, one cohort, one case-control study, six cross-sectional studies and two case series. Poor oral health was common, with tooth loss, plaque accumulation and untreated decay. Functional dependence, upper-limb impairment and care dependency were associated with oral-health difficulties. Orofacial deficits persisted in one small longitudinal cohort. Oral-care trials reported mixed results: advanced care improved plaque and gingival outcomes in one trial, whereas a pilot protocol trial found no significant between-group differences. Intensive oral care was feasible in acute dysphagic stroke. Evidence was limited by risk of bias, attrition and imprecision, with low to very low certainty.

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Conclusions: Poor oral health after stroke is associated with functional dependence and impaired self-care. These findings support coordinated oral-health assessment and rehabilitation across primary care, dentistry and physiotherapy. However, low-certainty evidence limits conclusions about intervention effectiveness, highlighting the need for adequately powered trials with standardized outcomes.

1. INTRODUCTION

Stroke remains a leading cause of death and long-term disability worldwide, and the growing number of survivors places sustained demands on rehabilitation and primary care services (GBD 2019 Stroke Collaborators, 2021). Beyond the neurological deficits that dominate acute management, survivors commonly face secondary problems, including swallowing difficulty, malnutrition, infection and reduced quality of life, that are shaped by everyday functions such as eating, speaking and personal hygiene.

The mouth is central to these functions. Systematic evidence indicates that people with stroke have poorer oral hygiene and periodontal condition than people without stroke (Dai et al., 2015), and scoping work has mapped the breadth of oral care problems encountered along the post-stroke pathway (Kwok et al., 2015). Poor oral health in this population is clinically relevant because oral bacteria can be aspirated by people with impaired swallowing, and oral care has been linked to lower pneumonia occurrence in older adults living in institutional care (Yoneyama et al., 2002).

Stroke can also impair the motor, sensory and cognitive capacities required for oral self-care. Hemiparesis, reduced upper-limb dexterity, fatigue, forgetfulness and disrupted routines make toothbrushing and denture care harder, as described by survivors and professionals in community settings (O'Malley et al., 2020). Orofacial impairment, including weakened chewing, facial asymmetry and reduced lip force, is quantifiable after stroke and may affect eating and nutrition (Schimmel et al., 2017a). Mobility limitations may further hamper attendance at dental services, an issue that has been explored in studies of tooth care and dental attendance among stroke survivors (Hunter et al., 2006).

Responsibility for these needs is distributed across several disciplines. Family physicians and general practitioners coordinate long-term follow-up and are often the first to recognize dental pain, weight loss or infection; dentists diagnose and treat oral disease and rehabilitate dentitions; and physiotherapists, who address mobility, balance and upper-limb recovery, influence the physical capacity needed for self-care. These disciplines frequently work in parallel, and gaps in staff training and confidence in supporting oral care have been highlighted (O'Malley et al., 2020).

The evidence base for oral care interventions after stroke also remains limited. A Cochrane review concluded that the available trials were of low to very low certainty and that the optimal way of delivering oral care to people after stroke is uncertain (Campbell et al., 2020). Existing syntheses have largely examined oral outcomes or interventions in isolation, rather than considering oral health together with functional and mobility status.

Consequently, it remains unclear how oral health, physical function and mobility interact after stroke, and what this implies for coordinated care across primary care, dentistry and rehabilitation. A synthesis that connects these domains could inform shared screening, referral and training pathways, particularly where dental services are not integrated with stroke rehabilitation.

Therefore, this systematic review aimed to evaluate studies published between 2009 and January 2026 that assessed oral health needs, functional and mobility limitations, and oral care interventions in adults after stroke, in order to inform multidisciplinary practice. The review addressed the following question: in adults after stroke, how are oral health status and oral care outcomes associated with functional and mobility impairment, and which interventions improve oral health in these settings?

2. METHODS

2.1. Protocol and reporting

This review was conducted and reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 statement (Page et al., 2021).

2.2. Search strategy and information sources

PubMed/MEDLINE, Embase, Scopus, Web of Science, CINAHL and the Cochrane Central Register of Controlled Trials were searched, together with ClinicalTrials.gov, for records published from 1 January 2009 to January 2026. Reference lists of included studies and relevant reviews were screened manually. Searches combined three concept blocks (stroke, oral health, and function or rehabilitation) using controlled vocabulary and free-text terms, and were adapted to each database. The PubMed strategy was:

("stroke"[MeSH] OR "cerebrovascular accident" OR "stroke survivor*" OR hemipar* OR hemipleg*) AND ("oral health"[MeSH] OR "oral hygiene"[MeSH] OR "dental plaque" OR periodont* OR "tooth loss" OR "dental caries" OR toothbrush* OR "oral care" OR "oral health-related quality of life" OR mastication OR "bite force") AND (rehabilitation OR "activities of daily living" OR "physical function*" OR mobility OR "upper limb" OR "motor function" OR Barthel OR "functional independence" OR balance OR physiotherap* OR "physical therapy") Filters: English; 2009/01/01 to January 2026.

The PubMed strategy is provided above; strategies were adapted to the syntax of the other sources.

2.3. Review question (PICO)

1. Population: adults (≥18 years) with ischemic or hemorrhagic stroke in acute, rehabilitation or community settings.
2. Intervention/Exposure: stroke-related functional, mobility or care-dependency status (e.g., Barthel Index, Functional Independence Measure, Berg Balance Scale, upper-limb function) and/or oral care interventions (toothbrushing, chlorhexidine, staff or caregiver training).
3. Comparator: people without stroke, patients with different functional levels, usual care, or alternative oral care regimens, where applicable.
4. Outcomes: oral health (DMFT, plaque and gingival indices, Oral Health Assessment Tool, tooth loss, denture status), orofacial function (chewing performance, lip and bite force), oral health-related quality of life, and complications such as pneumonia.

2.4. Eligibility criteria

Inclusion criteria: randomized controlled trials, cohort, case-control, cross-sectional studies and case series; adults with stroke; at least one oral health or orofacial outcome; full text in English; publication between 2009 and January 2026. Exclusion criteria: narrative or systematic reviews, qualitative-only studies, protocols, conference abstracts, editorials and single case reports; animal or in vitro studies; non-stroke or mixed populations without extractable stroke data; studies without an oral health outcome. Companion reports of the same cohort were linked, counted as one study, and complementary eligible outcomes were extracted from every relevant report.

2.5. Study selection and data extraction

Records were de-duplicated and screened by title and abstract, followed by full-text assessment against the eligibility criteria. Two reviewers independently screened titles and abstracts, then full texts, resolving disagreements by consensus. Extracted data comprised first author, year, country and setting, design, stroke phase, sample size, participant age, oral and functional measures, key quantitative results and the authors' conclusions.

2.6. Risk of bias and certainty of evidence

Randomized trials were appraised with the Cochrane RoB 2 tool (Sterne et al., 2019). Cohort, case-control, cross-sectional and case-series studies were appraised with the corresponding Joanna Briggs Institute critical appraisal checklists (Moola et al., 2020; Munn et al., 2020). Studies were categorized as low, moderate or high risk of bias, with RoB 2 judgments reported as low risk, some concerns or high risk. The certainty of evidence for each outcome domain was rated using the GRADE approach (Guyatt et al., 2008).

2.7. Data synthesis

Results were synthesized narratively, structured by outcome domain (oral disease burden, function and oral health, orofacial function, and interventions) in line with synthesis without meta-analysis principles. Meta-analysis was prespecified as feasible if

two or more studies reported the same outcome with compatible effect measures. This was not possible because of differences in designs, populations, outcome scales and reporting of dispersion.

3. RESULTS AND DISCUSSION

3.1. Study selection

The database and register searches yielded 1,779 records (1,741 from databases and 38 from registers). After removal of 612 duplicates, 1,167 records were screened, 83 reports were sought for retrieval and 80 were assessed in full text, yielding 13 eligible studies. Citation searching contributed two further studies. One additional Dai et al. clinical report was identified during report linkage and included as a companion report, without adding another study or participants. Fifteen studies reported in 16 publications were therefore included (Figure 1).

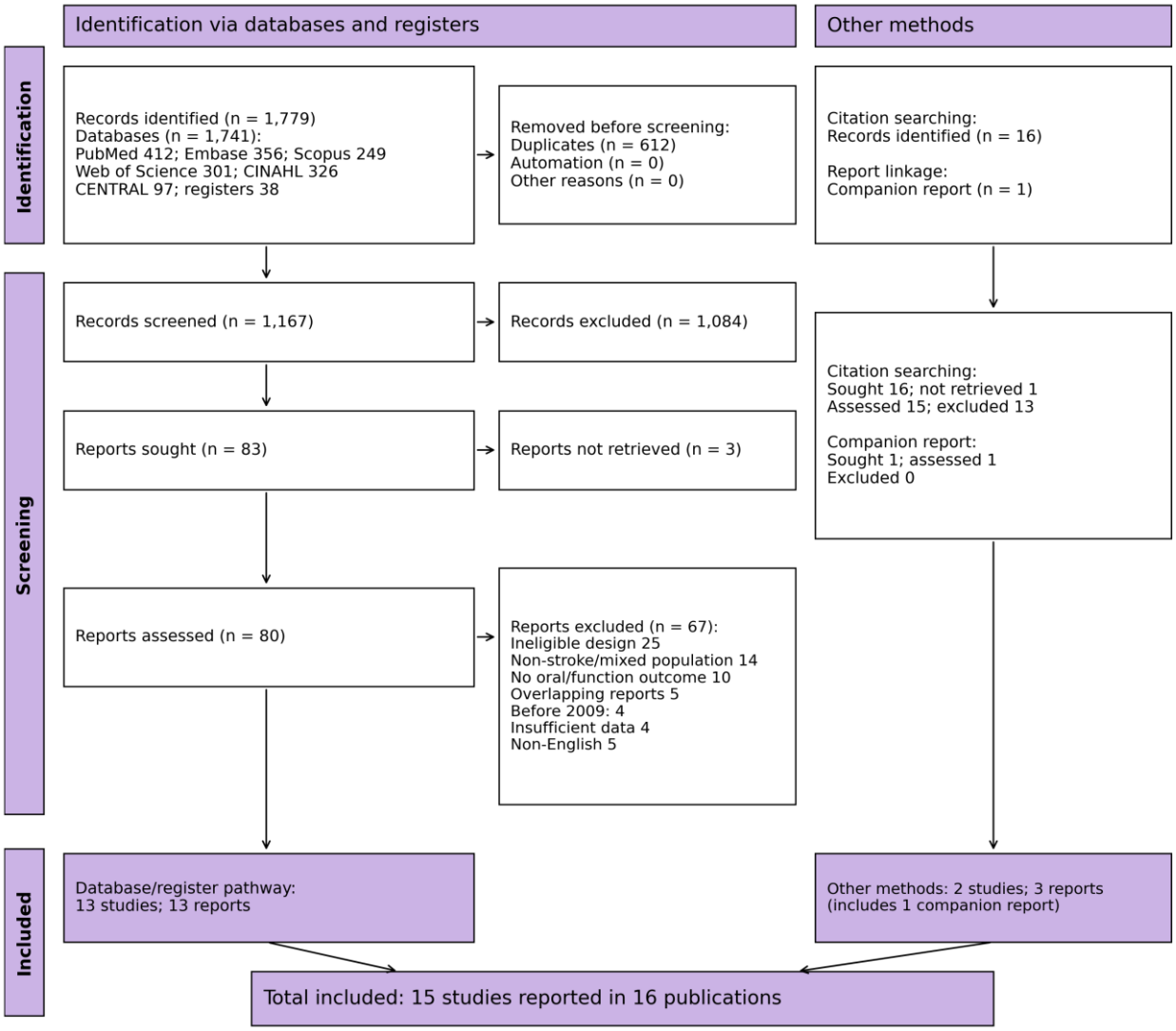


Figure 1. PRISMA 2020 flow diagram of study identification, screening and inclusion. Database/register screening yielded 13 studies; citation searching added two studies, and report linkage added one companion publication. Adapted from PRISMA 2020 (Page et al., 2021).

3.2. Characteristics of included studies

The 15 included studies, published between 2010 and 2025, covered acute stroke units, rehabilitation, outpatient and community settings across twelve countries or regions (Table 1). Designs comprised five randomized trials, one prospective cohort, one

case-control study, six cross-sectional studies and two case series. Stroke/control denominators were not separately established for the Yoshida report, so a complete combined participant total is not reported. Functional status was most often measured with the Barthel Index or Functional Independence Measure, while upper-limb, balance and orofacial measures were assessed in smaller subsets.

Table 1. Characteristics of the included studies.

#	Study	Country / setting	Design	Stroke population / phase	Participants (stroke / controls)	Oral and functional measures
1	Corsalini et al. (2010) (3)	Italy; neurological clinic	Case series	Chronic stroke (12–60 months); removable-denture wearers	33 / –	Oro-dental and removable-denture status
2	Asahi et al. (2015) (1)	Japan; rehabilitation hospital	Case series	Inpatient rehabilitation	165 / –	Orodental status, systemic disease, antithrombotic use, dental treatment needs
3	Lam et al. (2013) (12)	Hong Kong; rehabilitation ward	RCT (three-arm, single-blind)	Inpatient rehabilitation (3 weeks)	102 / –	Dental plaque, gingival bleeding, oral function, infectious complications
4	Schimmel et al. (2013) (20)	Switzerland; neurorehabilitation	Prospective cohort (2 years)	Hospitalized, hemisyndrome with facial palsy	31 / 24 (mean age 69.0 y)	Chewing efficiency, lip and bite force, masseter thickness, hand-grip strength
5	da Silva et al. (2015) (4)	Brazil	Cross-sectional	Survivors with hemiparesis	27 / –	Upper-extremity function (SSQOL-B); OHIP-14
6	Dai et al. (2017a,b) (6, 30)	Hong Kong; outpatient rehabilitation	RCT (two-arm; 3-month intervention, 3-month follow-up)	Outpatients, moderate to severe stroke	94 at baseline / –	Clinical plaque and gingival bleeding outcomes; OHRQoL and subjective health (linked clinical and quality-of-life reports)
7	Schimmel et al. (2017) (22)	Switzerland; hospital	Case-control	Hospitalized post-stroke patients	27 / 27 (mean age 64.3 y)	Masticatory performance, lip and bite force, tactile thresholds, dry mouth
8	Gerreth et al. (2021) (8)	Poland; rehabilitation	Cross-sectional (pilot; 12-week program)	Subacute ischemic stroke	60 / –	DMFT, gingival and plaque indices; Barthel, FIM, Berg Balance, ACE III

#	Study	Country / setting	Design	Stroke population / phase	Participants (stroke / controls)	Oral and functional measures
9	Lawal et al. (2021) (13)	Nigeria; rehabilitation	Cross-sectional	Stroke survivors in rehabilitation	60 / –	Simplified Oral Hygiene Index; Modified Ashworth Scale; Action Research Arm Test; OHIP-14
10	Moldvai et al. (2022) (15)	Hungary; national rehabilitation institute	Cross-sectional	Rehabilitation inpatients	410 / – (mean age 59.2 y)	DMFT (WHO criteria), oral health behaviors, FIM, Barthel Index
11	Wu et al. (2023) (25)	China; two tertiary hospitals	Cross-sectional	Older inpatients with ischemic stroke	346 / –	Oral Health Assessment Tool, Barthel Index, EAT-10
12	Smith et al. (2025) (23)	United Kingdom; four stroke units	RCT (2×2 factorial feasibility)	Acute dysphagic stroke within 24 h of admission	101 / – (median age 73 y)	Feasibility, safety and tolerability of oral care; clinical outcomes including pneumonia
13	Yoshida et al. (2012) (27)	Japan; rehabilitation hospital	Cross-sectional comparison	Recovery rehabilitation; stroke and other diagnoses	358 examined overall; stroke/control split not established	Remaining teeth by age group
14	Kim et al. (2014) (28)	Korea; university hospital ICU	RCT	Stroke inpatients in ICU	56 / –	Plaque index, gingival index, attachment loss and Candida colonization
15	Chipps et al. (2014) (29)	USA; rehabilitation unit	RCT	Poststroke dysphagia	51 / –	Oral health assessment, swallowing, oral intake and bacterial colonization

Abbreviations: DMFT, decayed, missing and filled teeth; FIM, Functional Independence Measure; GOHAI, General Oral Health Assessment Index; OHIP-14, Oral Health Impact Profile-14; RCT, randomized controlled trial; SSQOL-B, Stroke-Specific Quality of Life Scale, Brazilian version.

3.3. Key findings

Oral disease burden was substantial across settings, and functional dependence and care dependency were associated with oral-health difficulties (Tables 2 and 3). Intervention effects varied. The Dai trial favored advanced oral hygiene care for plaque and gingival bleeding; Kim reported improvements in plaque, gingival indices and salivary Candida, while Chipps found no significant between-group difference. These studies do not establish that oral care prevents post-stroke pneumonia, nor do multicomponent comparisons isolate an independent powered-brushing or chlorhexidine effect.

Table 2. Key quantitative findings of the included studies.

Study	Main quantitative findings
Corsalini et al. (2010) (3)	189 post-stroke patients were examined 12–60 months after stroke; 60 wore a removable denture and 33 participated. The authors recommended dental review 1 month after stroke and then every 3–4 months.
Asahi et al. (2015) (1)	165 inpatients in rehabilitation were reviewed; 54.5% were prescribed antithrombotic drugs. A high need for dental treatment was documented, and treatment during inpatient rehabilitation was judged effective.
Lam et al. (2013) (12)	Plaque reductions were significantly greater in both chlorhexidine arms than with oral hygiene instruction alone ($P < .001$); gingival bleeding reductions were 3- to 4-fold greater; no pneumonia cases occurred during the 3-week trial.
Schimmel et al. (2013) (20)	Chewing efficiency and lip force were impaired versus controls with no significant improvement over 2 years; contralesional hand-grip strength was also impaired and did not recover; bite force did not differ between sides. 21 of 31 patients were lost to follow-up.
da Silva et al. (2015) (4)	Upper-extremity function correlated strongly and negatively with OHIP-14 ($r = -0.722$); mean OHIP-14 was 4.63 (SD 6.6), indicating mostly a weak impact of oral health on quality of life.
Dai et al. (2017a,b) (6, 30)	Advanced care (powered brush, 0.2% chlorhexidine, instruction) improved OHRQoL on the Oral Health Transition Scale at 3 months ($P < .01$) and GOHAI at 6 months ($P < .05$), and physical component SF-12 scores at 3 and 6 months (both $P < .05$). 74/94 were assessed at 3 months and 57/94 at 6 months. In the linked clinical report, advanced care produced less plaque and gingival bleeding than conventional care at 3 months (both $P < .001$); differences persisted at 6 months (plaque $P < .05$; gingival bleeding $P < .01$).
Schimmel et al. (2017) (22)	Contralesional intra-oral tactile sensitivity was significantly lower than in controls (P between .0001 and .0002); lip force and masticatory performance were lower; bite force was similar; dry mouth and food hoarding were more frequent.
Gerreth et al. (2021) (8)	Barthel, FIM and Berg Balance scores were inversely related to gingival and plaque indices ($P < .05$); ACE III and Barthel Index predicted DMFT, and FIM predicted the decayed-surface score.
Lawal et al. (2021) (13)	Oral hygiene index was significantly related to upper-extremity spasticity and motor function (shoulder muscles); 8% ($n = 5$) reported a strong impact of oral health on quality of life.
Moldvai et al. (2022) (15)	Mean DMFT 20.13 (SD 8.08), comprising 3.28 decayed, 15.02 missing and 1.83 filled teeth. FIM correlated significantly with oral health behaviors, and patients brushing once a month had the lowest FIM scores.
Wu et al. (2023) (25)	Median OHAT score 5 (range 0–16); dental decay 91.7% (278/303); poor oral hygiene 92.2% (319/346). Sex, hyperlipidemia, stroke severity, stroke events, oral health behaviors and care dependency were independently associated with oral health ($P < .05$).
Smith et al. (2025) (23)	626 patients screened; 101 randomized (77% of eligible approached; median NIHSS 10; 44% women). Oral care with chlorhexidine and powered brushing, supported by staff training, was feasible, safe and well tolerated, and progression criteria for a definitive trial were met.

Study	Main quantitative findings
Yoshida et al. (2012) (27)	Of 443 rehabilitation patients offered an examination, 358 accepted. Stroke patients in their 50s and 60s had fewer remaining teeth than patients with other disorders in the corresponding age groups: 18.4 ± 9.4 vs 24.5 ± 5.4, and 18.3 ± 9.2 vs 22.2 ± 7.2 (both $P < .05$).
Kim et al. (2014) (28)	Fifty-six patients were randomized (29 intervention; 27 control). The oral-care program reduced plaque index, gingival index and salivary Candida colonization relative to control ($P < .05$); no significant differences were found for attachment loss or tongue Candida. Pneumonia reduction was not established by this study.
Chipps et al. (2014) (29)	Fifty-one patients were enrolled. Oral-health assessments, swallowing and oral intake improved in both groups, without significant between-group differences. Staphylococcal colonization changed from 4.8% to 9.5% in controls and 20.8% to 16.7% with intervention; the difference was not significant.

SD, standard deviation; NIHSS, National Institutes of Health Stroke Scale; OHAT, Oral Health Assessment Tool; OHRQoL, oral health-related quality of life.

Table 3. Authors' conclusions and principal disciplinary relevance.

Study	Authors' main conclusion	Principal disciplinary relevance
Corsalini et al. (2010) (3)	Oral health providers should monitor stroke survivors with regular follow-up.	Dentistry: scheduled recall; denture review. General practice: referral trigger.
Asahi et al. (2015) (1)	Dental treatment needs are high and can be met during inpatient rehabilitation.	Dentistry: treatment planning with antithrombotic therapy. Family medicine: medication information.
Lam et al. (2013) (12)	Chlorhexidine with a standard mechanical plaque-removal tool safeguards oral health after acute stroke.	Dentistry and nursing: protocolized oral care. Family medicine: post-discharge continuity.
Schimmel et al. (2013) (20)	Impaired chewing and lip force seem not to improve without orofacial rehabilitation.	Physiotherapy and speech therapy: orofacial exercise. Dentistry: masticatory rehabilitation.
da Silva et al. (2015) (4)	Compromised upper-limb function and poor self-perceived oral health impair quality of life.	Physiotherapy: link upper-limb training to self-care tasks. Family medicine: ask about oral self-care.
Dai et al. (2017a,b) (6, 30)	Advanced oral hygiene care improved subjective health more than conventional care.	Dentistry and general practice: supply and teach powered brushing.
Schimmel et al. (2017) (22)	Oral sensitivity may influence chewing function after stroke.	Dentistry and physiotherapy: sensory and masticatory assessment.
Gerreth et al. (2021) (8)	Poor oral health may be associated with rehabilitation outcomes.	Physiotherapy: functional status informs oral risk. Dentistry: joint rehabilitation planning.
Lawal et al. (2021) (13)	Upper-extremity function matters for oral hygiene status; stroke has little impact on OHRQoL.	Physiotherapy: spasticity and motor control. Family medicine: do not rely on OHRQoL alone.

Study	Authors' main conclusion	Principal disciplinary relevance
Moldvai et al. (2022) (15)	Interdisciplinary prevention and care models are needed for post-stroke patients.	All four disciplines: shared screening, education and referral.
Wu et al. (2023) (25)	Oral health assessment and individualized education should be strengthened in older patients.	Family medicine and nursing: screen high-risk groups. Dentistry: targeted prevention.
Smith et al. (2025) (23)	Intensive oral care is feasible and safe in acute dysphagic stroke; a definitive trial is warranted.	General practice and family medicine: long-term follow-up. Dentistry: training of ward staff.
Yoshida et al. (2012) (27)	Tooth loss was associated with stroke in this rehabilitation sample; causality was not established.	Dentistry: assess dentition. Family medicine: identify oral-health needs.
Kim et al. (2014) (28)	Structured oral care improved measured oral hygiene and gingival outcomes during ICU admission.	Nursing and dentistry: provide and evaluate stroke-specific oral-care protocols.
Chipps et al. (2014) (29)	This pilot did not establish superiority over usual care; larger studies are needed.	Nursing: standardized care and monitoring. Family medicine: continuity after discharge.

3.4. Risk of bias and certainty of evidence

Risk of bias varied across studies, with randomized trials showing some concerns or high risk, particularly in relation to missing outcome data and potential deviations from assigned care. Observational studies were limited by small single-center samples, convenience sampling and confounding (Table 4). Certainty was judged low for advanced oral hygiene care effects on plaque and gingival outcomes, and very low for associations between functional status and oral health, owing to risk of bias, imprecision and heterogeneous measurement.

Table 4. Risk-of-bias assessment of the included studies.

Study	Tool	Selection / randomization	Measurement of exposure and outcome	Confounding / missing data	Overall
Corsalini et al. (2010) (3)	JBI case series	Moderate: consecutive examination, but only 33 of 60 denture wearers participated	Moderate	High: descriptive, no comparator	High
Asahi et al. (2015) (1)	JBI case series	Moderate: single hospital, one year	Low	High: descriptive, no comparator	Moderate
Lam et al. (2013) (12)	RoB 2	Low	Low: outcome assessors blinded	Some concerns: single-blind delivery	Some concerns

Study	Tool	Selection / randomization	Measurement of exposure and outcome	Confounding / missing data	Overall
Schimmel et al. (2013) (20)	JBI cohort	Moderate: small, matched controls	Low: objective measures	High: 21 of 31 patients lost to follow-up	High
da Silva et al. (2015) (4)	JBI cross-sectional	Moderate: small sample	Low: validated scales	Moderate: correlation only	Moderate
Dai et al. (2017a,b) (6, 30)	RoB 2	Low	Low	High: 57/94 assessed at 6 months; linked clinical and quality-of-life reports concern the same trial; assess missingness separately by outcome and time point	High
Schimmel et al. (2017) (22)	JBI case-control	Moderate: matched controls	Low: objective tests	Moderate	Moderate
Gerreth et al. (2021) (8)	JBI cross-sectional	Moderate: single center	Low: validated scales and WHO criteria	Moderate: regression used	Moderate
Lawal et al. (2021) (13)	JBI cross-sectional	Moderate	Low	Moderate: bivariate analyses	Moderate
Moldvai et al. (2022) (15)	JBI cross-sectional	Low: sample-size calculation, STROBE	Low: WHO criteria, FIM, Barthel	Low to moderate	Low
Wu et al. (2023) (25)	JBI cross-sectional	Moderate: convenience sampling	Low	Low: multivariable logistic regression	Moderate
Smith et al. (2025) (23)	RoB 2	Low	Low	Some concerns: open delivery of oral care	Some concerns

Study	Tool	Selection / randomization	Measurement of exposure and outcome	Confounding / missing data	Overall
Yoshida et al. (2012) (27)	JBI cross-sectional	Moderate: single rehabilitation center; 358/443 examined	Low: clinical tooth counts	Moderate: age-group comparisons; limited confounding control	Moderate
Kim et al. (2014) (28)	RoB 2	Low: randomized allocation reported	Low: objective clinical indices	Some concerns: assess allocation concealment, deviations and outcome completeness; sample size affects precision	Some concerns
Chipps et al. (2014) (29)	RoB 2	Low: randomized trial	Low: blinded oral-health assessments	Some concerns: unblinded delivery and missing outcome data require outcome-specific assessment	Some concerns

JBI, Joanna Briggs Institute checklist; RoB 2, Cochrane risk-of-bias tool for randomized trials. Domain-level judgments were independently confirmed against the full texts by two reviewers.

3.5. Discussion

Oral health after stroke sits at the intersection of neurological recovery, daily-living capacity and access to care, which makes it a natural target for multidisciplinary management. The evidence synthesized here shows that oral disease is common and often advanced in survivors across acute, rehabilitation and community settings, and that the capacity to maintain oral hygiene is tightly linked to the degree of physical and cognitive recovery.

The consistently high burden of tooth loss, plaque and untreated decay agrees with earlier systematic evidence that people with stroke have poorer oral health and periodontal status than people without stroke (Dai et al., 2015), and with observations that survivors have fewer remaining teeth than age-matched reference populations (Yoshida et al., 2012). Part of this burden predates the stroke. Chronic periodontitis has been associated with ischemic stroke in pooled analyses (Leira et al., 2017), and shared risk factors such as smoking, diabetes and socioeconomic disadvantage plausibly contribute to both conditions. The stroke itself then compounds the problem, so that oral disease should be viewed as both a marker of vascular risk and a consequence of disability, a bidirectional relationship that cross-sectional designs cannot disentangle.

Patients with lower independence in daily activities, weaker or spastic upper limbs and greater care dependency showed worse oral hygiene than their more independent counterparts. The likely mechanism is mechanical and cognitive rather than motivational: effective toothbrushing demands fine motor control, bilateral coordination, sustained attention and the ability to attend to both sides of the mouth, all of which are vulnerable after stroke. Reduced dexterity of the dominant hand, hemispatial neglect and apraxia limit plaque removal, while fatigue and disrupted routines reduce the frequency of cleaning, as survivors and professionals have described (O'Malley et al., 2020). Where care is delegated, its quality then depends on caregiver training and confidence, a gap that has repeatedly been identified in stroke services (Kwok et al., 2015; O'Malley et al., 2020).

Orofacial function showed a distinct pattern: chewing efficiency, lip strength and intra-oral sensation were impaired in comparison with healthy controls, whereas bite force was largely preserved, and the deficits did not recover during prolonged follow-up. This dissociation fits the neurophysiology of the condition, because reduced sensory feedback and weak perioral musculature impair bolus manipulation and containment, promote food pooling on the affected side and increase plaque retention and caries risk, even when jaw-closing muscle strength is adequate. The absence of spontaneous recovery argues for targeted orofacial rehabilitation, yet none of the included studies tested physiotherapy-led or speech-therapy-led orofacial training, which represents a clear evidence gap in the physiotherapy dimension of this review.

Intervention studies offered encouraging, though qualified, results. Structured programs combining powered brushing, an antimicrobial rinse and instruction improved plaque control and subjective health, and intensive oral care was feasible and safe in acutely dysphagic patients. The proposed mechanisms are complementary: chlorhexidine reduces the oral microbial load and gingival inflammation, while powered brushes deliver standardized motion that lowers the manual dexterity required of patients or carers. The absence of significant between-group benefits in the Chipps pilot trial tempers the favorable findings from some other trials. Collectively, the findings remain compatible with the cautious conclusions of the Cochrane review, which judged the certainty of evidence to be low to very low and found little evidence that multicomponent programs differed from usual care for plaque (Campbell et al., 2020). Differences in comparators, follow-up and sample size counsel caution before regarding any single regimen as established. Likewise, the biological plausibility of preventing aspiration pneumonia through oral care, supported by evidence from institutional care (Yoneyama et al., 2002), remains unproven in stroke because the available trials were not powered for that outcome.

A further finding concerns the divergence between clinical and patient-reported measures. Several studies documented poor hygiene and extensive disease alongside only a weak perceived impact on quality of life, and the authors themselves suggested that functional disability or cultural resignation might explain this pattern. This conflicts with the improvements in subjective oral health seen after intervention in trials, and it implies that generic impact questionnaires may underestimate need in a population with adapted expectations, reduced social participation and limited insight. Clinicians should therefore rely on structured clinical screening rather than on patient complaint alone.

These results carry practical implications for each discipline. Family physicians and general practitioners, who provide continuity after discharge, are well placed to ask about oral self-care, review medications that cause dry mouth, identify weight loss or swallowing problems and trigger dental referral. Dentists should be involved early in rehabilitation, adapt treatment to antithrombotic therapy and cognitive status, and support regular recall, in line with the recommendation for scheduled follow-up in survivors. Physiotherapists can contribute by integrating upper-limb and balance training with task-specific practice of toothbrushing and denture handling, thereby translating motor recovery into oral self-care. Shared screening tools, training of ward and community staff, and clear referral routes would convert these roles into a coordinated pathway.

Several limitations should be acknowledged. The included studies were heterogeneous in design, setting, stroke phase and outcome measures, and most were observational with small samples and limited adjustment for confounding, which precluded meta-analysis and limits causal inference. Attrition affected both a randomized trial and the only cohort study, mobility was measured through diverse scales, and only English-language publications were considered, which may have introduced language and publication bias. Nevertheless, the convergence of findings across countries and care settings strengthens confidence in the central message that oral health and physical function are interdependent after stroke. Future work should test integrated, discipline-spanning interventions in adequately powered trials with standardized oral and functional outcomes, longer follow-up and patient-centered endpoints.

4. CONCLUSION

Poor oral health after stroke is associated with functional dependence, upper-limb impairment and persistent orofacial deficits. Some structured oral-care interventions improve selected oral outcomes, although the evidence remains of low to very low certainty and does not establish an independent benefit of powered brushing or chlorhexidine, or prevention of post-stroke pneumonia. Coordinated screening, self-care support and referral across family medicine, general practice, dentistry and physiotherapy may help address these interconnected needs. Adequately powered multidisciplinary trials with standardized outcomes are needed to establish clinical effectiveness.

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AUTHOR CONTRIBUTIONS

All authors equally contributed to this work (Conceptualization, Methodology, Data Curation, Formal Analysis, Writing – Original Draft, Writing – Review & Editing, and Supervision)

CONFLICT OF INTEREST

The authors declare no conflict of interest.

ETHICS STATEMENT

This study is a systematic review of previously published, de-identified data and did not involve new human or animal subjects; formal ethics approval was therefore not required.

DATA AVAILABILITY STATEMENT

The data extraction tables supporting this review are available from the corresponding author upon reasonable request. All included studies are publicly available in the cited peer-reviewed sources.

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