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# Miswak (Salvadora persica) Users Behaviors and Perceptions in Oral Health Maintenance: A Scopus-Based Literature Review

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**ABSTRACT**

Miswak (Salvadora persica) is a traditional oral-cleaning tool widely used in many countries, particularly among Muslim communities. Beyond its religious importance, miswak has potential oral-health benefits. This review examines published evidence on users' behaviors and perceptions of miswak for oral-health maintenance. A structured Scopus literature search was conducted using terms related to miswak, behavior, perception, and oral health. The final Scopus query retrieved 42 records, all of which were retained without additional post-search filtering. Selected findings were discussed using a narrative synthesis. The reviewed literature suggests that religious, cultural, social, familial, and perceived health-related factors shape miswak use. Users often regard miswak favorably, although knowledge and application techniques vary across settings. These observations indicate that culturally sensitive oral-health promotion can consider miswak use while emphasizing evidence-based, safe hygiene practices.

***Keywords:*** *Oral Health, Health Behavior, User Perception, Salvadora Persica, Miswak*

## 1. INTRODUCTION

Oral health is an integral part of general health and contributes to quality of life. Good oral health supports mastication, communication, and appearance and helps prevent systemic complications associated with oral infections [1]. Nevertheless, oral conditions remain major public-health concerns in many countries. Dental caries, periodontal diseases, and oral mucosal disorders remain prevalent, particularly where oral-hygiene practices and access to dental care are inadequate [2].

Efforts to improve oral-health practices include modern toothbrushing and traditional methods passed down through generations. Miswak (Salvadora persica), a stem or root used to clean the teeth and mouth, remains widely used. Its use has been documented for centuries across Asia, Africa, and the Middle East [3]. In Islamic traditions, miswak has religious significance because its use is encouraged in the Prophet Muhammad's teachings; it therefore represents not only a hygiene practice but also religious observance and identity [4].

Research has increasingly examined the possible oral-health effects of miswak. Salvadora persica contains compounds such as fluoride, silica, tannins, alkaloids, sulfur, vitamin C, and essential oils, which may contribute to antimicrobial or anti-inflammatory activity and plaque control [5]. Some studies have reported that appropriate miswak use may yield oral-hygiene outcomes comparable with conventional toothbrushing in specific settings [6]. Thus, miswak combines longstanding cultural significance with a developing body of clinical and laboratory evidence.

Although clinical and pharmacological aspects of miswak have been widely studied, the behavioral factors underlying its continued use are less consistently described. Adoption is shaped not only by perceived effectiveness but also by psychological, social, cultural, economic, and

religious influences [7]. Perceived convenience, comfort, availability, effectiveness, and religious values may affect attitudes and use. Because study populations and designs differ, associations between user characteristics and miswak practices require context-sensitive interpretation.

In recent decades, miswak research has expanded beyond clinical outcomes to address users' perceptions, knowledge, motivation, acceptance, and perceived barriers [8], [9], [10]. However, this evidence is dispersed across dentistry, public health, pharmacy, medical anthropology, and religious studies. Such fragmentation makes it difficult to understand the ways in which miswak-related perceptions and behaviors are formed and maintained.

A structured literature review can bring these dispersed findings together [11] and help characterize users, their motivations, perceived benefits and risks, and implications for oral-health maintenance. Literature synthesis can also identify gaps in current evidence and inform subsequent research [12].

Accordingly, this review explores the literature on miswak (Salvadora persica) users' behaviors and perceptions in maintaining oral health. It considers the determinants of miswak use, perceptions of benefit, and its role in oral-hygiene practices. The findings may inform culturally responsive health promotion, dental practice, and further investigations of traditional oral-care practices.

## 2. METHODS

This study used a structured literature-search approach and narrative synthesis to examine published findings concerning miswak users' behaviors and perceptions in oral-health maintenance. The objective was to describe research trends, user characteristics, influencing factors, and public-health implications. The methodological discussion drew on guidance by Nightingale [13].

Scopus was initially searched on 6 June 2026. The final query retrieved 42 records using the following TITLE-ABS-KEY search string: TITLE-ABS-KEY (("Salvadora persica" OR siwak OR miswak) AND (behavior OR usage OR perception) AND oral AND (health OR hygiene*)). The search targeted terms in article titles, abstracts, and keywords. No additional post-search filtering was applied to the retrieved set.

The review examined miswak-related knowledge, attitudes, perceptions, motivations, and oral-hygiene practices. All 42 records returned by the final Scopus query were retained without an additional eligibility filter, as part of the literature dataset. Empirical research informed the behavior-focused synthesis; laboratory and pharmacological studies were cited only to provide scientific context. Therefore, the 42 records should not be interpreted as 42 independently appraised empirical studies.

Relevant information discussed in the narrative included authorship, publication year, setting, study aims, design, participant characteristics, and findings relevant to miswak use. Ten illustrative empirical studies were summarized in Table 1. The table provides a focused illustration of the behavioral findings discussed in the narrative, rather than a complete itemization of the Scopus dataset.

The narrative synthesis grouped observations by perceived benefits, religious values, knowledge and attitudes, motivations, family and social influences, and everyday oral-hygiene practices. Study findings were compared descriptively to identify recurring themes, while avoiding causal conclusions from cross-sectional evidence.

Interpretations considered the clarity of study objectives, methodological fit, reported participants, and relevance to the review question. No formal study-level risk-of-bias ratings were calculated because a reproducible assessment dataset was not available.

## 3. RESULTS AND DISCUSSION

### 3.1 Result

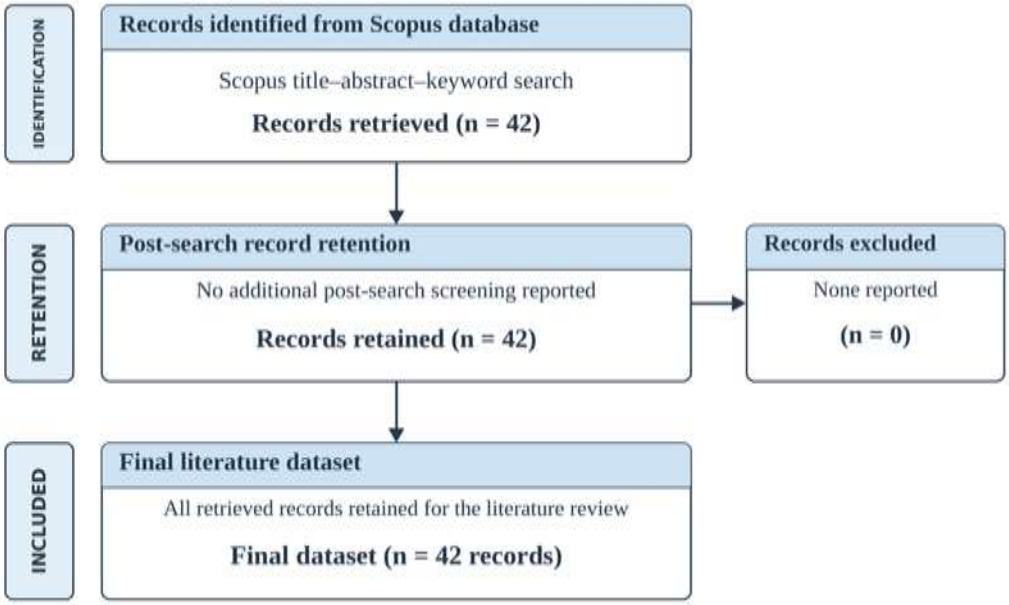



Figure 1. Scopus literature search and record-retention flow (n = 42).

The final Scopus query retrieved 42 records related to miswak use and oral health, all of which were retained in the literature dataset. Exact annual publication counts are not reported because a verified year-by-year frequency table for the final 42 records was unavailable. The records and studies discussed nevertheless indicate sustained interest in the behavioral and cultural dimensions of miswak use.

Studies discussed in this review were conducted in Saudi Arabia, Malaysia, Pakistan, the United States, Jordan, Indonesia, and other countries, illustrating the geographical diversity of miswak research. Country-level frequencies are not reported because a verified tabulation for the 42-record dataset was unavailable. The cited studies nevertheless illustrate how miswak use can be investigated across different cultural, religious, and healthcare settings.

Table 1. Summary of ten relevant empirical studies on miswak use

| No. | Author (Year) | Methods and Participants | Key Findings on Miswak |
|---|---|---|---|
| 1 | Al-Otaibi et al. (2003) | Structured survey/interviews; 1,155 patients in Mecca, Saudi Arabia. | About 65% used miswak daily; use was more frequent among men and older participants. |
| 2 | Almas et al. (2003) | Survey of dental students in Saudi Arabia; 481 invited; 77% response. | Combined miswak–toothbrush use was reported by 53% of male and 83% of female students. |
| 3 | Farsi et al. (2004) | Survey of students aged 12–18 years in Jeddah, Saudi Arabia (n = 2,586). | Miswak use was more frequently reported by boys and public-school students. |
| 4 | Darout et al. (2005) | Secondary-school survey, Khartoum, Sudan (n = 396). | Miswak use at least twice daily was reported by 64.3% of boys and 52% of girls. |
| 5 | Tubaishat et al. (2005) | Survey of adults in Irbid, Jordan (n = 138). | 20.5% used both miswak and toothbrush; 3% used only miswak. |

| No. | Author (Year) | Methods and Participants | Key Findings on Miswak |
|---|---|---|---|
| **6** | Memon et al. (2014) | Cross-sectional study of male religious-school students aged 6–12 in Pakistan. | Miswak use was reported by 36% of rural and 28% of urban respondents. |
| **7** | Laird et al. (2015) | Qualitative interviews with 82 Somali refugees in Massachusetts, USA. | Miswak related to religious-cultural identity, family habits, and product access. |
| **8** | Bramantoro et al. (2018) | Survey of Indonesian Islamic boarding-school miswak users (n = 109); TPB. | Perceived behavioral control showed the strongest association with intention to use miswak. |
| **9** | Saadaldina et al. (2020) | Cross-sectional study, Medina, Saudi Arabia (n = 460). | 34.3% reported miswak use and 84.3% toothbrush use; observational design. |
| **10** | Khan et al. (2026) | Qualitative study in Lahore, Pakistan; teacher focus groups and 17 parent interviews. | Miswak discussed as a religious-cultural practice; cost and fear as barriers to dental care. |

*Source: Authors' Narrative Synthesis of The Studies Listed in Table 1.*

Table 1 summarizes ten illustrative empirical studies using both quantitative surveys and qualitative interviews. Their findings concern patterns of miswak use, oral-hygiene perceptions, and religious and social contexts. Not all studies evaluated clinical effectiveness, so each finding is interpreted within its design and measurement limitations.

This synthesis focuses on empirical evidence concerning users' knowledge, attitudes, motivations, and practices. Laboratory and phytochemical research provides background on possible oral-health mechanisms but is not used as primary evidence of users' behaviors or perceptions. The narrative is organized around recurring themes describing how individuals understand and use miswak.

Religious values emerge repeatedly in research on miswak use. In many Muslim communities, miswak is understood both as an oral-hygiene tool and as a practice associated with the Prophet's Sunnah. Religious identity and spiritual motivation may therefore reinforce continued use. Research on halal oral-care preferences associates religious perceptions with attitudes toward miswak [14]. In a Theory of Planned Behavior model, however, Bramantoro et al. [15] identified perceived behavioral control, rather than subjective norms, as the strongest factor related to intention to use miswak.

The cultural and religious significance of miswak has also been described among dental educators and scholars, although their understanding of its benefits and appropriate use varies [16]. Related qualitative research found that some users connect miswak with everyday worship, religious identity, and contemporary oral-care decisions [10].

Perceived health benefits also shape miswak use. Users frequently associate it with tooth cleaning, fresher breath, stronger gums, and protection against caries. A review of the natural toothbrush tradition discusses perceived antimicrobial, antiplaque, anticaries, and antigingivitis effects in specific settings [17]. Laboratory and clinical studies report chemical constituents and biological effects that may contribute to oral health, but these results should not be equated with direct evidence about behavioral motivations [3], [18].

A scoping review of research spanning several decades described possible effects of miswak on plaque, gingival inflammation, and oral microbial activity [19]. Experimental studies have also investigated *Salvadora persica* extracts against oral pathogens and as components of periodontal biomaterials [20], [21]. Such findings provide biological context but do not themselves establish users' beliefs or behaviors.

Positive perceptions do not necessarily correspond to detailed oral-health knowledge. In Sudanese secondary-school students, miswak use was common while understanding of dental and periodontal disease varied across participants [22]. A study in Jordan likewise reported strong oral-

health beliefs among some miswak users alongside gaps in knowledge about plaque, periodontal disease, and effective hygiene techniques [23].

In Medina, Saudi Arabia, an observational study reported that 84.3% of respondents used toothbrushes and 34.3% used miswak [8]. These figures describe oral-hygiene practices but cannot establish a causal relationship between oral-health awareness and miswak use. Research among parents and teachers at Islamic boarding schools in Pakistan also described how caregivers and educators shape children's oral-health practices [24].

Family context may contribute to oral-hygiene habits, including miswak use in some settings. An international survey of children found associations between hygiene practices and parental or household characteristics [25]. Research among parents and teachers at Islamic boarding schools similarly highlighted the influence of home and school environments on children's oral-health practices [24].

Religious-school students in Pakistan may learn about miswak through family and faith-based education. Support from parents and teachers was associated with oral-health knowledge and habits [26]. In Saudi Arabia, miswak also persists as an intergenerational cultural practice and a marker of religious and community identity [27].

Miswak is not always used instead of a toothbrush. Users may combine traditional and conventional tools in their routines. In a Jordanian survey, 20.5% reported using both miswak and a toothbrush, whereas 3% reported miswak alone [23]. These survey findings describe patterns of use and beliefs; they do not demonstrate superior clinical outcomes for the combined practice.

Miswak use may also occur where access to professional dental services is limited. In a rural Pakistani study, many respondents reported self-management of oral problems, and 22.12% used miswak as an oral-cleaning tool [28]. The findings suggest that access, tradition, and personal preferences may intersect, but the study design does not isolate their relative contributions.

Among women in Saudi Arabia, natural remedies, including miswak, have been used to manage oral-health concerns before professional consultation [29]. Educational contexts likewise appear relevant: students with stronger oral-health knowledge may report healthier practices [30], and dental visits have been linked to oral-health awareness [31]. These associations should be interpreted in light of the methods of the individual studies.

Self-perceived oral malodor is another behavioral concern. A survey of dental students documented oral-hygiene habits, combined miswak-toothbrush use, and self-reported bad breath [32]. This study did not establish that miswak directly prevents halitosis. A Kuwaiti study likewise examined factors associated with self-reported halitosis [33]. Studies involving schoolchildren have also reported associations between oral-hygiene behavior and caries-related outcomes [34], [35], although they do not consistently isolate the specific effect of miswak.

Safety and technique deserve attention. A systematic review of gingival recession among miswak users discussed possible periodontal concerns associated with long-term or improper use [36]. These findings reinforce the importance of education about proper technique and the need to distinguish user perceptions from demonstrated clinical effects.

Overall, the literature portrays miswak use as a practice shaped by religion, culture, family, education, social experience, and perceived health benefits. Religious factors recur in many studies, particularly among Muslim populations; however, the narrative synthesis does not quantify or rank their comparative effects. Positive perceptions may support continued use, while knowledge and technique vary. Oral-health promotion that includes miswak should therefore respect cultural and religious contexts while emphasizing safe, evidence-informed hygiene.

### 3.2 Discussion

The findings suggest that miswak use extends beyond tooth cleaning and reflects the intersection of health, culture, and religion. Unlike tools adopted primarily for perceived clinical effectiveness, miswak may carry both health-related and religious meaning [37]. It therefore illustrates how traditional health practices can remain socially relevant alongside modern dentistry.

From a health-behavior perspective, decisions to use miswak are not explained solely by a rational assessment of benefits and risks. Some users maintain the practice despite ready access to modern products, reflecting its symbolic role in religious and cultural identity [4]. Miswak use may thus communicate belonging as well as a personal approach to oral care.

These observations also suggest limitations in oral-health initiatives based only on knowledge transfer. Miswak use can remain common even where detailed oral-health knowledge is incomplete [7], [8]. Social norms, habits, inherited practices, and religious beliefs may also shape behavior. Interventions should therefore take account of the social settings in which choices are made.

Miswak provides an example of a traditional practice that persists during healthcare modernization. The spread of modern toothbrushes has not necessarily displaced miswak; in some contexts, both tools coexist [4], [38]. This pattern suggests that communities may integrate rather than replace traditional and biomedical approaches to health.

Combined use of miswak and toothbrushes can also be viewed through the lens of medical pluralism, in which different health-knowledge systems are used alongside one another [39]. This does not necessarily indicate rejection of modern dentistry; it may instead reflect adaptation of traditional habits to present-day oral-care routines.

For health communication, miswak may provide an accessible entry point for culturally sensitive oral-health promotion. Messages consistent with familiar values can be more readily accepted, especially where miswak has strong religious meaning. However, its inclusion in educational programs should be accompanied by clear guidance about appropriate oral-hygiene methods, rather than assumptions of superior effectiveness [40].

The reviewed literature is concentrated in Middle Eastern and Asian settings with substantial Muslim populations. Evidence from minority Muslim communities and non-Muslim populations is less extensive. Cross-cultural studies could clarify whether motivations for miswak use differ across social settings, healthcare systems, and consumer preferences for natural products.

Conceptually, miswak illustrates the interaction of individual, interpersonal, community, cultural, and religious influences on health behavior. A multidisciplinary perspective is needed to understand how beliefs and identities shape everyday practice. Future investigations should connect such perspectives with rigorously measured oral-health outcomes.

## CONCLUSION

The literature discussed in this review indicates that miswak (Salvadora persica) use is shaped by religious and cultural meanings, family and community practices, and perceived oral-health benefits. In several Muslim communities, miswak serves both as an oral-cleaning tool and as a symbol of religious identity. Users commonly associate it with natural, affordable oral care, although perceived benefits cannot in themselves establish clinical effectiveness or safety. Miswak may be used alongside conventional toothbrushes rather than replacing them. Across the studies considered, knowledge of appropriate oral-hygiene practices and use techniques varied. The narrative synthesis identifies recurring influences but does not quantify their relative importance or establish that religiosity is the dominant determinant in every population. Miswak may therefore be relevant to culturally sensitive oral-health promotion when combined with evidence-based guidance on hygiene and safe use.

Further research should apply explicit behavioral frameworks, longitudinal and qualitative designs, and cross-cultural comparisons to clarify how knowledge, motivation, social context, and religious identity relate to the adoption and continued use of miswak. Studies should also investigate appropriate techniques, frequency and duration of use, and possible periodontal effects, while connecting self-reported practices with objective indicators such as plaque indices, gingival and periodontal status, dental caries, and oral-health-related quality of life. Because the available narrative does not document a reproducible study-selection or risk-of-bias assessment process,

future reviews should report their search records, screening decisions, and quality appraisal transparently.

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