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Is *Siwak* (Chewing Stick) an Effective Oral Hygiene Practice in Modern Society?

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ABSTRACT

Islamic religion emphasised siwak (chewing stick) use as tooth and mouth cleaning tool, but the practice that modelled towards the Prophet's Muhammad, peace be upon him (PBUH) behaviour is unclear. A study was conducted via individual semi-structured interviews, aimed to explore and map various aspects of the siwak practice from the perspective of contemporary Muslim scholars. These experts concurred that current siwak users vary in their observance towards the purpose, handling and timing of the siwak routine. It is a concern that deviations from the Prophet's actual practices may limit the advantages of siwak, cause adverse effects on oral tissues and falsely portray siwak as an inferior option among modern communities. Findings from this study are derived from a triangulation of literatures and modern-day scholars' interpretation which may be used as a basis for developing future guidelines on effective and safe siwak practice that is well-fitted to contemporary modern lifestyle.

Keywords: *siwak practice; Prophet's practice; religious belief; Muslim scholars; oral hygiene*

The method and practice of tooth cleaning, regardless of the device used, is considered important in determining the effectiveness of oral hygiene care (World Health Organization (WHO) 1987). The chewing stick or *siwak* has been known as an oral hygiene tool since the pre-Islamic era and became prominent when Prophet Muhammad adopted it as a Muslim practice (Jardim et al. 2009; Husain & Khan 2015). His companions and subsequently other Muslims had continued the practice for generations as part of their religious duties as well as personal hygiene (Bos 1993). For instance, the congregation tabligh (jamaat tabligh) is a group of Muslims who travels the world to promote Islam and are known for their devotion to practicing of the Prophet (PBUH), including using *siwak* to clean their teeth (Bos 1993; Metcalf 2003).

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Nowadays, *siwak* is widely practiced globally in Middle East and Asia countries such as Pakistan, India, Nepal, Africa, Indonesia, Vietnam, and Malaysia (El-Bcheraoui et al. 2016; Shirzaiy et al. 2016; Saleh et al. 2017; Nguyen et al. 2018; Ekowmenhenhen et al. 2019; Kumar et al. 2019; Ibrahim et al. 2020; Singh et al. 2020; Hotchandani et al. 2022). The majority of these countries have a large Muslim population, thus, contributing to the preference for *siwak* due to religious belief. Therefore, the users consider the act as part of religious obedience by following in the footsteps of the Prophet (Agbor & Azobo 2013; Alayan et al. 2017; Al-Hammadi et al. 2018). Based on a survey among *siwak* users, most of them are faithful to the Prophet's *siwak* method and practice (Ibrahim et al. 2020). While Muslims generally acknowledge the benefits of *siwak* for oral health, they have limited knowledge of the Prophet's way of practicing *siwak* (Nordin et al. 2014). Therefore, it is not surprising that there are discrepancies in the routine use of *siwak* demonstrated by the varying tooth cleaning techniques (Baharin et al. 2016; Ibrahim et al. 2020). Clinically, *siwak* is an effective tool in maintaining oral health, including plaque removal and gingivitis prevention, but some users have experienced receding gums, which could be due to errors in the method and practice of *siwak* (Ramli et al. 2021; Ramli et al. 2022).

The narrations, actions and deeds of the Prophet, including his *siwak* practice, had been recorded by commentators as collections of hadith which are used by Muslims as a source of reference and guidance for worship and daily transactions. However, correct interpretation of the hadith according to its contextual meaning is crucial and requires appropriate knowledge that are normally obtained through formal Islamic education. In our efforts to transform the context of hadith into appropriate guidelines for lay people, this study aimed to explore in-depth the Prophet's way of practicing the *siwak* from the perspective of contemporary Muslim scholars.

Methodology

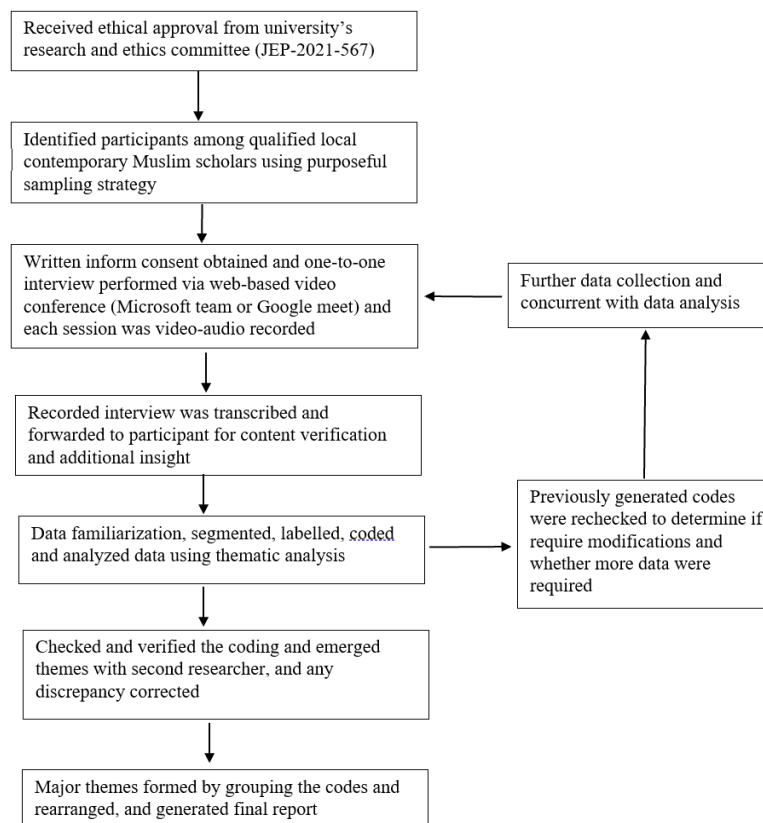


Fig. 1. Qualitative study flow diagram

This qualitative study was approved by the university's research and ethics committee (JEP-2021-567). The data were obtained during one-to-one semi-structured interviews with the participants. The discussion explored the participants' insights on their experiences and perspectives related to the use and practice of the *siwak* as a tooth cleaning tool (DeJonckheere & Vaughn 2019). First, the participants were identified among local contemporary Muslim scholars qualified and well-known in hadith (narrative records), sirah (prophetic biography), and fiqh (Islamic jurisprudence) using a purposeful sampling strategy. Since the identified participants are experienced and knowledgeable in their respective fields, only a few experts were required for the study (Malterud et al. 2016). Next, the participants were personally contacted and provided with written information about the project, and those who agreed to partake in the study were invited via email. Then, a written informed consent was obtained before each session. The individual interviews were conducted for the five selected participants (P1, P2, P3, P4 and P5) at their convenience.

The interview sessions were separately conducted via a web-based video conference (Microsoft Team or Google Meet) and recorded. Interviewers are dental professionals who verbally declare no conflict of interest. The main researcher (HR) moderated the interview sessions in the presence of experienced interviewers (TNMD and SMS). Each semi-structured interview was conducted between August and October 2021 according to an interview protocol that lasted about 60 to 100 minutes. The open-ended questions were prepared based on the literature review concerning the application and effects of *siwak* on oral health. The interview began with standard questions regarding the participants' demographics, background, and work experience. Then, the session was followed by introductory questions about the importance of *siwak* practice in oral hygiene care. Subsequently, the interview focused on the method and practice of *siwak* from the perspective of contemporary Muslim scholars.

Each recorded interview was transcribed immediately upon completion and forwarded to the participants for content verification and additional insights (Hagens et al. 2009). Once the interview data were ready, the analysis was conducted concurrently with further data collection and modification throughout the study. Emergent issues that required further exploration were identified for subsequent interviews. Meanwhile, researchers continued to develop a deeper understanding of the research questions as the study progressed.

A thematic analysis (Clarke & Braun 2017; Kiger & Varpio 2020) was carried out in this study, starting with data familiarization by going through the transcripts repeatedly and noting the early impression. Data from the text were segmented, labelled, and coded based on their relevance to the research question. At the same time, potential trends or connections between items that might contribute to emerging themes were identified. The analysis was conducted systematically; after the second transcript, previously generated codes were rechecked to determine if modifications and data were required. A single text extracted from the transcript may be labelled with multiple codes, while a code can be associated with more than one theme. The data collection process continued until no new codes, and emerging themes were identified. The analysis was conducted manually using Microsoft word and transferred into the ATLAS.ti 9 software (ATLAS.ti Scientific Software Development GmbH, Germany) for further analysis. Figure 1 illustrates the flow diagram of study process.

Results

Siwak originated from the Arabic language and is defined as an act of rubbing off any substance from the teeth surfaces using specialised tools such as a toothbrush or a *siwak* stick. The participants agreed with the definition and considered the *siwak* practice as rewarding for Muslims since they are continuing the practice of Prophet Muhammad (PBUH). The study findings based on the Muslim scholars' perspective are as illustrated in Figure 2, which presented according to the following themes:

1. The Prophets' (PBUH) recommendation on *siwak* practices.
2. Negative implications of improper handling and practice of *siwak* by current users.
3. The Muslim scholars' recommendations on method of *siwak* practice.

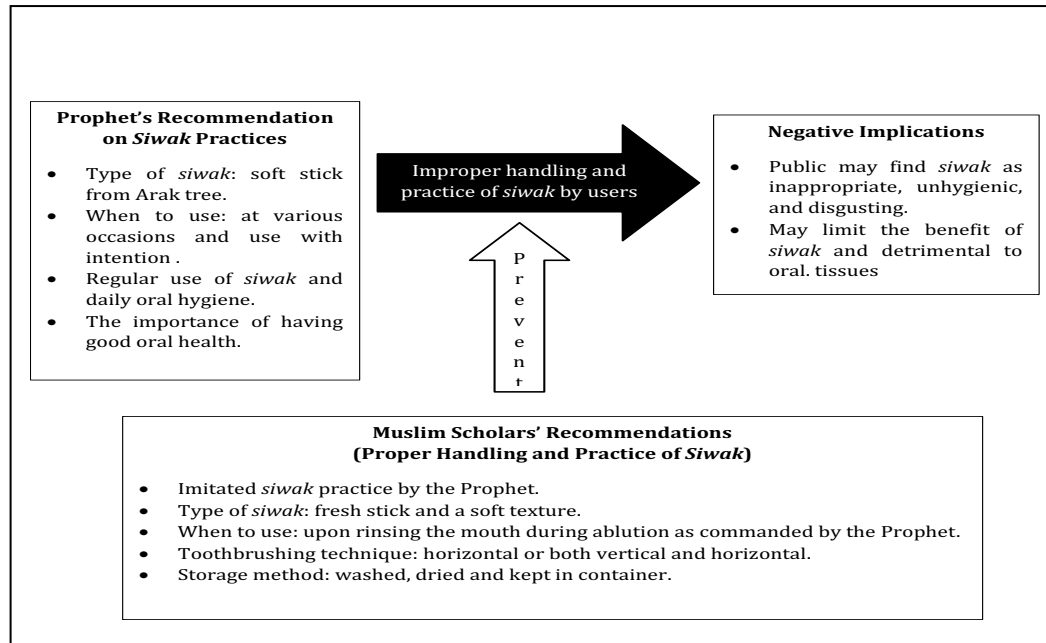


Fig. 2. Framework of Muslim scholars' perspectives on implications and hindrance of deterrence of improper handling and practice of *siwak*

Prophet's Recommendations Regarding the *Siwak* Practice

The experts in this study agreed that the best *siwak* is sourced from the Arak tree (*Salvadora persica*) as requested by the Prophet (PBUH). According to the participants, the stick harvested from the Arak tree is soft, thus, fit for *siwak*. Participant (P1) quoted a Sahih (authentic) narration to indicate the Prophet (PBUH) favoured *siwak* practice. Nasiruddin al-Bani narrated as follows:

"The Messenger of Allah (God), peace and blessings be upon him, said, 'I was ordered to use by the Angel Jibreel the use of tooth stick so often that I was afraid my teeth might fall out.' Sahih (authentic) according to Al-Albani (Source: Musnad al-Bazzar 2455) (www.abuaminaelias.com) (P1).

Participants referred to the narrations that indicated the Prophet (PBUH) practiced *siwak* prior to worship and on various occasions, such as upon awakening and before sleep, every Friday, entering the house, before meeting family members and friends when there were changes in the mouth odour and teeth yellowing. Ultimately, the Prophet (PBUH) also performed the *siwak* in the last few moments of his life before returning to God as a courtesy before meeting his Creator.

On average, the Prophet performed *siwak* five times, a routine that coincided with the five daily obligatory prayers. Furthermore, the Prophet (PBUH) recommended his companions and devotees to practice *siwak*. Participants (P1, P2 and P3) quoted the narrations of the following hadith:

1. Anas bin Malik (Prophet Muhammad's (pbuh) assistant) narrated Prophet Muhammad's (PBUH) as follows: "It is I who routinely apply the acts of *siwak*. I have indeed urged you about *siwak*." (Sahih Sunan an-Nasa'i 6) (sunnah.com) (P1, P2).
2. Anas bin Malik also narrated that Prophet Muhammad (PBUH) said: "I have always used *siwak*, but I must reiterate the importance of *siwak* to all." (Sahih Al-Bukhari 888) (sunnah.com) (P3).
3. It was narrated on the authority of Riwayat Muslim hadith that A'ishah, and Ummul Mukminin Zainab Zahsy witnessed that Prophet Muhammad (PBUH) said: "Had I not thought it difficult for my followers, I would have commanded them to brush (*siwak*) their teeth during ablution before every salat (prayer)" (Sahih Sunan an-Nasa'i 7) (sunnah.com) (P1, P3).

Participants (P1 and P3) stated that the use of *siwak* was highly emphasised by Prophet, and he detested his friends whose teeth had yellow plaque for the fear that such bad oral hygiene might disgust or scare people away (in the authority of Riwayat Ahmad Hanbal in al-Musnad). Prophet Muhammad often offered the dhikr (recitation), begging for God's forgiveness. The Prophet felt guilty and embarrassed if he had bad breath while in the act of worship of asking, particularly after consuming odour-inducing food resembling onions. As such, Prophet Muhammad commanded: "Whoever ate from these plants, garlic and red onions, they should not enter our mosque." (Sahih al-Bukhari 853) (sunnah.com) (P1). Moreover, the Prophet (PBUH) practiced and recommended the act of *siwak* prior to offering prayers at mosques. These actions highlighted the importance of frequent *siwak* and oral hygiene in the daily life of a Muslim.

Negative Implications of Improper Handling and Practice of *Siwak* among Muslims

The participants agreed that Muslims should be aware of improper handling of the *siwak* that may lead to negative impressions of behaviour associated with Muslims in general. Furthermore, the public may question the relevance of this method in the presence of modern toothbrushes. Subsequently, the public lack of knowledge and experience on this sunnah may lead to further reproach upon encountering Muslims who do not comply to the proper handling of the *siwak*, such as exhibiting its use in public at certain times and situations may be deemed inappropriate by others. The participants' views are as follows:

"It was not encouraged to dispense of *siwak* (with retching noise) when to start the prayer, because friends sitting next to them may feel disgusted . . ." (P1 and P2).

". . . if you use *siwak* for no reason and it is not in our culture. Then people will scoff or even harass our action..." (P3).

". . . it is possible that after use, he (user) placed *siwak* in his pocket" (P1).

". . . keeping a *siwak* stick on the ear and go into the office, and not having this habit in our custom, it may be quite inappropriate..." (P4).

Another perspective of concern is improper method of using the *siwak* while cleaning the teeth because this habit may undermine the benefits of oral health. These were the participant's views:

". . . errors in practice of the sunnah, is supposed to cause a deficit in terms of *siwak* effectiveness..." (P1).

". . . using very hard texture of *siwak* fibers, brush in vertical movement may be detrimental to the gums and cause bleeding or applying excessive force is harmful and cause mobile tooth, and the inappropriate storage of *siwak* stick will create unhygienic condition . . ." (P1).

"Negative responses or effects was not originated from *siwak* stick, but the problem was related to the method of *siwak* practice" (P2).

Muslim Scholar's Recommendations on Method of *Siwak* Practice

The participants (P1, P2, and P3) recommended users dispense *siwak* when rinsing the mouth during ablution as commanded by the Prophet Muhammad to preserve the sanctity of the sunnah. Participant (P3) interpreted that *siwak* practice by the Prophet (pbuh) is purposeful and should be emulated by the Muslim followers. In addition, all the participants emphasized the selection of a fresh stick with a soft texture to avoid oral tissue injuries and fully benefit from the good habit. Furthermore, a participant (P2) recommended that the dried stick be moistened before use. Meanwhile, most participants believed that the Prophet (PBUH) used *siwak* in horizontal movements. Participant (P1) quoted Imam Nawawi narration as saying that *siwak* brushing, according to the sunnah of the Prophet, should be wide (horizontal) and not vertical (top to bottom and vice versa), as this can cause bleeding or damage to the gums. Similarly, a participant (P4) recommended horizontal brushing instead of vertical. Even though P2 and P5, suggested of applied both horizontal and vertical brushing, depending on individual need.

A participant (P4) also encouraged debris removal from the *siwak* stick by excavating food residues and contaminants on the brush-end using al-Arak twig. According to the sirah expert (P1), there was an assistant (Abdullah Bin Mas'ud) who managed, administered, and assisted the use and maintenance of the *siwak* of Prophet (PBUH). He kept, cleaned, and preserved *siwak* tree twigs in pristine conditions for the Prophet (PBUH) to use. Moreover, the *siwak* stick is cleansed before storage as narrated on the authority of Abu Daud: "...once Prophet Muhammad (PBUH) used *siwak*, the Prophet would hand it to his wife, A'ishah, for cleaning" (Hassan Sunan Abi Dawud 52) (sunnah.com) (P1, P2)

According to the participants, no hadith explicitly indicated the specific maintenance of the *siwak* stick. However, they provided several suggestions to be observed as their routine tooth cleaning practice:

1. A participant (P1) suggested having a proper container to store the *siwak* stick.
2. The experience of the Arabs or the majority of the people should be followed when storing *siwak* sticks, and certain individuals utilize a container. Fill the container halfway with water and add a pinch of salt (P1).
3. According to participant (P2), the *siwak* stick should be washed, dried, and placed in an empty container with a lid for sanitary purposes.
4. A participant (P3) believed that the *siwak* stick should be placed vertically. The Prophet (PBUH) used a small storage box to store personal items for brushing, shaving, and hair oil. Therefore, it is inferred that the *siwak* stick was placed in that box.
5. Participant (P4) recommended that the *siwak* storage should be in line with the general toothbrush hygiene practices and storage.

Discussion

Many Muslim rituals emphasise the importance of mouth hygiene, such as rinsing the mouth as an integral part of wudu' and *siwak* use. The participants' opinions on the method of *siwak* practice were referenced from compelling narrations, deeds, and actions of the Prophet in hadith, consented propositions, and personal experiences. Furthermore, authentic hadith narrations indicated that the Prophet (PBUH) routinely used *siwak* and highly recommended the practice. Moreover, the Prophet used to turn away the congregation who had bad breath from the mosque. The Prophet's action further reiterated the importance of practicing proper oral hygiene as a symbol of cleanliness and purity among Muslims, which can be achieved through regular plaque control (Owen and Sami 2016).

The mouth or oral cavity comprises several components including teeth, gingival sulcus, tongue, cheek, lip, and soft and hard palate, which form a heterogenous ecosystem that facilitates the colonization of various microbial communities (Xu et al. 2015; Kilian et al. 2016). Furthermore, the mouth is a warm and moist environment consisting of saliva protein, glycoprotein and gingival crevicular fluid (GCF) that offers nutrients for the growth of many microorganisms (Van-der-Horst et al. 2013). Reportedly, a diverse bacterial population inhabit the mouth, and at least 500 species were identified from the subgingival plaque sample (Paster et al. 2001). To maintain good gingival health, it is crucial to establish the relationship between bacterial plaque and host response that will result in mutual adaptation and functional integration (Kilian et al. 2016). If the subgingival plaque build-up is not controlled, the environment within the biofilm will favour pathogenic bacterial species and initiate excessive immune-inflammatory host response in susceptible patients, resulting in destruction of tooth supporting structures (Meyle & Chapple 2015).

Mechanical plaque control can reduce plaque accumulation and gingivitis (Wiegand & Schlueter 2014; Chapple et al. 2015). Furthermore, consistent toothbrushing can diminish the risk of tooth loss (Van-der-Weijden & Slot 2015). In the present study, participants reported that the Prophet (PBUH) frequently used *siwak* for toothbrushing. His teeth were described as perfect, white and shiny due to regular *siwak*. Besides religious belief, it is an accepted belief that good oral health is a benefit for users who choose to practice *siwak* (Darout & Homeida 2016; Hotchandani et al. 2022), reporting improvements in their oral hygiene, fresh feeling and whiter teeth (Agbor & Azodo 2013; Alayan et al. 2017; Al-Hammadi et al. 2018). Equally important is that several clinical trials have shown that *siwak* is significantly effective in preventing plaque formation and gingivitis (Patel et al. 2012; Dizaye & Othman 2020; Rifaey et al. 2021).

Although *siwak* is advantageous in maintaining good oral health, adverse effect such as gingival recession was observed among users, particularly when *siwak* was used excessively (Darout et al. 2000; Shetty et al. 2010; Karia & Kelleher 2014; Shirzaei et al. 2016). Incorrect toothbrushing techniques and the hard *siwak* fibre are believed to be the root cause of gingival recession among devoted *siwak* users (Saleh et al. 2017). According to the participants, improper *siwak* practice is rampant among users, and these errors may impede the benefits of *siwak*, leading to adverse effects.

Some users utilize hard or dried-textured *siwak* besides practicing vertical toothbrushing technique, which contributes to gingival recession and progression, besides causing mobile tooth when excessive force is applied using *siwak* (Rajapakse et al. 2007; Wiegand & Schlueter 2014; Heasman et al. 2015). Despite the effectiveness of hard bristle toothbrushes for plaque removal (Zimmer et al. 2011), soft and extra-soft bristles are safer and gentler on the gums (Ranzan et al. 2019) and equally effective in removing plaque and maintaining gingival health (Ballini et al. 2021). Contrary to clinical findings, the participants of this study claimed that vertical toothbrushing might traumatise the gingival. Previously, it was reported that the prevalence of the horizontal or scrub toothbrushing technique was responsible for gingival recession (Heasman et al. 2015).

The collective views obtained from the participants have not been reported elsewhere, where issues related to the improper *siwak* practice by current users were highlighted. This habit may give rise to a negative perception among the community who lacks exposure and knowledge regarding the sunnah of the Prophet. Furthermore, some *siwak* users are passionate about practicing the sunnah but are unaware of the proper practices. Consequently, the public would consider the habit inappropriate and unsanitary. In addition, the public may feel disgusted when encountering users applying the *siwak* and accompanied by disturbing noise. Notably *siwak* is considered socially unacceptable, especially for Muslim refugees in non-Muslim countries (Laird et al. 2015; Alayan et al. 2017). Therefore, the participants in our study emphasised the importance of understanding the Prophet's *siwak* practice to prevent misconceptions arising from improper handling and use of the *siwak*, particularly from individuals and communities who are not familiar with Muslim beliefs and traditions.

The Prophet recommended the dispense of *siwak* during ablution as the most suitable time, and within the privacy of the ablution premise as the most suitable location. Additionally, the Prophet would clean his teeth and mouth with *siwak* before any special occasions and social gatherings and even had an assistant who cleaned and kept his *siwak* in pristine condition. Contrary to the Prophet's practices, current users often keep *siwak* sticks in their pockets to facilitate reuse (Alayan et al. 2017; Al-Hammadi et al. 2018; Ibrahim et al. 2020). In rural areas, users are found storing *siwak* places they found convenient such as cupboard tops, door panels, window frames or ventilation holes, and on the roof (Odongo et al. 2011). These storage methods would expose the *siwak* stick to dirt and dust and could potentially cause detrimental effects on the users.

The participants provided several recommendations for current *siwak* users appropriately handle, use and store their *siwak* in order to preserve the purity of the practice as a sunnah of Prophet Muhammad:

1. To wash, clean, and dry the *siwak* stick before placing it vertically in a closed container.
2. To soak the *siwak* stick in a mixture of salt and water before storage.
3. To store the *siwak* stick in accordance with the recommended toothbrush care.

Based on their experiences, the experts suggested selecting a fresh *siwak* stick or moisten the dried stick prior to application to prevent soft tissue injury. Such etiquette on *siwak* use was cited from classical references that advised Muslims of the suitable times and places to ensure privacy, cleanliness and safety (Rispler-Chaim 1992; Bos 1993; Marzband & Karnami 2016) as the following:

1. *Siwak* should not be conducted in public, social gatherings, while standing, reclining or sleeping, in the bathroom or toilet, in the middle of the street, and while talking.
2. *Siwak* should not be used on a weak tooth.
3. Toothbrushing should be done moderately.
4. *Siwak* sticks should be stored in hygienic conditions.
5. Recite supplications (du'a) to accompany *siwak*.

To conclude, the Prophet emphasised and promoted the importance of oral hygiene by regularly practicing *siwak* to maintain oral hygiene and subsequently oral health, including periodontal health. Despite his persistent advice, improper *siwak* handling and practices are observed among current users, leading to adverse effects and negative impressions among those lacking the knowledge and exposure to the sunnah of Prophet Muhammad. Therefore, the contemporary Muslim scholars in this study provided recommendations by triangulating evidence in the literature as the basis for developing guidelines on effective and safe *siwak* practice appropriate for a modern-day lifestyle.

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