ORIGINAL ARTICLE

Knowledge, Attitude, and Practices on Four Medicinal Plants for Oral Health of Oral Medicine Patients from a Dental College in Manila

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ABSTRACT

Background. Medicinal plants are widely used for healthcare needs, including oral health. In the Philippines, garlic, guava, tsaang-gubat, and hierba buena, although primarily recognized as plants used for the treatment of systemic diseases, are indicated as analgesics for dental pain, treatment of gingival inflammation, and oral health maintenance. Despite studies focusing on the effectiveness of these plants for oral health, there is little to no research on the populace's knowledge, attitude, and practices on these medicinal plants.

Objectives. The study aimed to determine the knowledge, attitude, and practices of Oral Medicine patients from a dental college in Manila on four medicinal plants (garlic, guava, tsaang-gubat, and hierba buena) for oral health.

Methods. A descriptive study design was used. Oral Medicine patients (694) were invited to participate in the study through daily text messages containing brief research details. The link to the three-part online questionnaire (Google Forms) was sent via text and Facebook messages, and was answerable within 15-20 minutes.

Results. Two hundred fourteen (214) Oral Medicine patients participated, with 147 (68.69%) having knowledge on using medicinal plants for oral health which they mostly knew through friends and acquaintances. Most participants had a generally positive attitude toward medicinal plants for oral health and believed they were beneficial (177, 82.71%), safe, effective, and cheaper than conventional medicine (175, 81.78%), and accessible (171, 79.91%). Only 64 (29.91%) personally used medicinal plants to address their oral health conditions. Garlic (144, 97.96%) was the most widely known and used, followed by guava (52, 35.37%), hierba buena (12, 8.16%), and tsaang-gubat (4, 2.72%).

Conclusion. Most participants were knowledgeable with a generally positive attitude toward the four medicinal plants for oral health but did not use these to address their oral health problems.

Keywords: garlic, guava, mint, tea tree, medicinal plants, oral health

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INTRODUCTION

Herbal medicine is commonly used in place of modern treatment, particularly in far-flung areas.[1] According to the World Health Organization (WHO), almost 80% worldwide rely on traditional medicine for primary healthcare needs.[2] Many people in developing countries resort to herbal medicine as an alternative to addressing their oral health concerns due to its accessibility, affordability, and cultural and religious influences.[3] Recently, there has been an emerging interest in medicinal plants for oral healthcare.[4,5]

There is a need to promote oral health in the Philippines due to the high prevalence of dental caries (72%) and periodontal diseases (43%) based on the 2018 National Monitoring and Evaluation Dental Survey.[6] Like most developing countries, the low expenditure on oral healthcare,

financial constraints, and lack of access to dental facilities limit most of the populace's general knowledge of oral health.[7]

The Department of Health - Philippine Institute of Traditional and Alternative Healthcare (DOH-PITAHC) endorse four out of ten scientifically proven herbal plants, namely garlic, guava, tsaang-gubat (Philippine tea tree), and hierba buena (wild mint), which are indicated for oral healthcare as analgesic, treatment of gingival inflammation, and maintenance of oral health, although primarily recognized as plants used for the treatment of systemic diseases.

Although there are international and local studies focusing on the effectiveness of the four medicinal plants in addressing oral health problems, there are little to no studies focusing on the populace's level of knowledge, attitude, and practices on the said medicinal plants. Some of these studies only contained tabulations of medicinal plants and the oral health conditions they address.[4,5,8,9] With the current trend of using medicinal plants for oral health, there is a need to determine the knowledge, attitude, and practices on four medicinal plants for oral health for possible promotion of the use of garlic, guava, tsaang-gubat, and hierba buena for treatment of several oral health diseases.

This research aimed to determine the knowledge, attitude, and practices on these four medicinal plants for oral health through an online questionnaire (Google Forms) among Oral Medicine patients in a dental college in Manila. The research serves as a baseline study on the dental patients' extent of knowledge, attitude, and practices on the four medicinal plants for oral health. Foreseen benefits of this research include a general idea of the patient population that can be used to tailor Information, Education and Communication (IEC) materials for possible oral health promotion of garlic, guava, tsaang-gubat, and hierba buena for dental caries, periodontal diseases, toothache relief, and other oral infections. This form of information dissemination may further popularize the four medicinal plants and shift the interest towards more studies on pharmacology and application on oral health, encouraging future herbal drug research and development. Furthermore, the diverse population gathered in the study is a good representative of the patient population in the dental college in Manila. The social demographic data gathered from the study may also be used for academic and commercial purposes by establishing a target population to promote medicinal plants for oral health.

This study merely describes the knowledge, attitude, and practices of Oral Medicine patients of a dental college in Manila on four medicinal plants (garlic, guava, hierba buena and tsaang-gubat) for oral health. It does not prove nor disprove the effectiveness of these plants in treating or preventing oral diseases. Moreover, the study's results are only generalizable to the Oral Medicine patients who are the study's target population and cannot be generalized to patients of other clinical dentistry sections of the college.

MATERIALS AND METHODS

Study Design

A descriptive study design was used as it aimed to know and describe the knowledge, attitude, and practices (KAP) of Oral Medicine patients of a dental college in Manila on four medicinal plants (garlic, guava, tsaang-gubat, and hierba buena) for oral health through quantitative means. The research used a primary data collection method, particularly an online survey wherein first-hand data was obtained from the Oral Medicine patients of the dental college in Manila. The format and contents of an online survey were similar to a face-to-face survey, except that it necessitated an internet connection and a gadget (smartphone, tablet, laptop, or desktop computer) to be completed. The study utilized quota sampling to describe a subgroup important to the research.

Variables for sample size computation were as follows:

- Estimated population size was 480;
  - Population size was computed from the total number of Oral Medicine patients of the dental college needed for the study [20 patients (from the estimated number of registered patients in the Oral Medicine section per day, considering both new and continuing cases) x 4 clinical days x 6 weeks (estimated data implementation period)]
  - Confidence level was set at 95%, and
  - Confidence interval was 5.

A sample size calculator from https://www.surveysystem.com/sscalc.htm was used. From the variables, the computed sample size was 214.

Population

The study participants were limited to Oral Medicine patients during the A.Y. 2019-2020 (August 2019 to March 2020) who underwent dental treatments such as scaling and polishing, periodontal therapy, and root canal treatment. The specific section was chosen because its patient population varied from young adults to elderly with different socio-economic statuses. This demonstrated a significant variation in patient demographics that was reflected in the results and discussions of the study. The time frame was chosen because most were active patients before the lockdown due to the COVID-19 pandemic. Moreover, patients most likely had existing communication with their clinicians since they had pending cases in the section (such as continuing root canal treatment and periodontal recall). Hence, their contact details were still active.

The inclusion criteria for the study were that the patient must:

- have a signed Broad Consent Form in the dental chart indicating the patient's permission for present and future use of personal and health information in accordance with the data protection policies of the dental college and the Data Privacy Act of 2012;

- be 18-59 years old;
- be literate and able to answer the online questionnaire by herself/himself; and
- have a gadget (smartphone, tablet, desktop computer, or laptop) with an internet connection (through SIM data or Wi-Fi) to complete the online questionnaire.

Excluded from the study were patients with:

- mental health conditions; and
- physical disabilities such as eyesight problems (astigmatism, myopia, hyperopia, and presbyopia), hearing loss, amputated/missing upper limbs, deafness, blindness, epilepsy, etc., as these conditions may hinder them from answering the questionnaire properly.

The first two inclusion criteria and exclusion criteria were evaluated through the patients' dental charts.

To recruit the participants for the study, a letter of request for data collection was addressed to the college dean, Clinical Dental Department chairperson, college data privacy officer, and Oral Medicine clinical section head. Upon approval, the Oral Medicine logbook was obtained from the staff-in-charge of the Oral Medicine section. All chart numbers and names of patients registered in the Oral Medicine logbook during the A.Y. 2019-2020 (August 2019 to March 2020) were recorded in a Microsoft Excel spreadsheet which can only be viewed by the researcher. After recording, the existing Microsoft Excel file containing patient information was requested from the staff-in-charge of the records room. The patients' signed broad consent forms were also checked with the help of the staff-in-charge to determine if the patients allowed their charts to be used for research purposes. After checking, the names, contact numbers, and social demographics (age, sex, civil status, highest educational attainment, and employment status) of patients who fit the inclusion criteria were encoded in the Microsoft Excel spreadsheet.

Data Collection

A three-part online questionnaire (Google Forms) was given to the Oral Medicine patients to determine their knowledge, attitude, and practices on four medicinal plants for oral health. The online questionnaire was self-administered and written in English and Filipino.

A pilot study was conducted from October 11, 2021, to October 26, 2021. The participants were 21 patients (10% of the sample size) in the Oral Medicinal logbook registered in August 2019 with a signed broad consent form. There were no modifications made on the online questionnaire because the questions and instructions were direct and concise according to the participants' feedback. Moreover, the questionnaire was answerable within 5-10 minutes, which was shorter than the anticipated 15-20 minutes.

The actual data collection took place on November 3, 2021. Twenty patients were invited to participate in the study every weekday through a text message containing brief details of the research. Patients were asked to answer the online questionnaire (Google Forms) with their preferred language (English or Filipino). A 30-peso load was sent to each participant to guarantee data connection for answering the online questionnaire. The online questionnaire link was sent through text messages and Facebook. Before proceeding with the actual questionnaire content, the informed consent was flashed which also stated that they can also decline or withdraw from answering the online questionnaire.

Participants were only limited to one response and their email addresses were collected to verify their actual participation. The participants were also encouraged to send a message to the researcher if there were questions or clarifications regarding the informed consent or online questionnaire. Lastly, the participants were asked to notify the researcher once they completed the online questionnaire. Upon completion, another 20-peso load was sent to each participant as a token.

The anticipated six weeks of data collection was extended due to the low response rate of participants invited to the study. To maximize recruitment and to attain the computed sample size, possible participants who did not reply during the first invitation were texted again. During the actual data collection, a total of 694 patients listed in the Oral Medicine logbook who met the inclusion criteria were invited to participate in the study. The computed sample size (214 participants) was met on May 17, 2022.

Data Processing and Analysis

The collected online questionnaire data was automatically encoded and tabulated in Google Sheets and were saved in a flash drive containing all documents included in the research. The contents of the flash drive are only accessible to the researchers. Data will be kept for five years to ensure compact storage of data.

Descriptive statistics were used to provide a better understanding on the knowledge, attitude, and practices of the Oral Medicine patients on four medicinal plants for oral health. Qualitative data were presented through graphs, charts, and tables to describe the Knowledge and Practices of study participants. For the Attitude part, a four-point Likert scale was used and quantitative data were analyzed through percentages. A biostatistician was consulted during the data analysis.

Study Limitations

Verification of data integrity is limited because data collection was done through a self-administered online questionnaire. Since there are no face-to-face interactions with the participants, the researcher can only verify their actual participation through counter checking the email addresses used to answer the online questionnaire and their message notification sent upon completion of the online questionnaire.

Ethical Considerations

This study implemented ethical considerations to protect the participants' fundamental human right to privacy. The researcher followed the guidelines and obtained ethics approval from the University of the Philippines Manila Research Ethics Board (2020-722-UND) before data collection. Moreover, the study is also investigator-funded.

To protect the respondents' privacy and confidentiality, any identifying information such as name, email address, and contact number were not included in the results and discussion of the final paper. Patient information such as chart number, name and contact details were collated in a Microsoft Excel spreadsheet for the sole purpose of inviting them to participate in the study, provided that the patient signed the college's broad consent form which allows patient information to be used for research purposes. The email addresses were also collected in Google Forms to limit one response per participant and to verify the actual participation of the patients. All gathered data from the Microsoft Excel spreadsheet and online questionnaire can only be accessed by the researcher.

The self-administered online questionnaire (Google Forms) used to determine the knowledge, attitudes, and practices of Oral Medicine patients on the four medicinal plants for oral health included a participant's informed consent in the first part of the Google Forms before the actual questionnaire content. Proceeding with the Google Forms indicates voluntary participation of the study, and the participants have the option to decline or withdraw from answering the online questionnaire.

RESULTS

Demographic Profile of Study Participants

The participants' social demographics were obtained from the Microsoft Excel file containing patient information from the staff in charge of the records room. The frequency and percentages are presented in Table 1.

The study participants were predominantly female (125, 58.41%), aged 18-29 years (110, 51.40%), and single (129, 60.28%). Most respondents were college graduates (73, 34.11%) and high school graduates (66, 30.84%), respectively. Regarding employment status, the highest percentage of participants were employed (102, 47.66%), but it was noted that unemployed participants were also high (93, 43.36%).

Knowledge on Four Medicinal Plants for Oral Health

The first part of the questionnaire consisted of five questions about the participant's knowledge of four medicinal plants for oral health. Of the 214 respondents, 147 (68.69%) had knowledge on using medicinal plants to address oral health problems (Figure 1). The 67 respondents (31.31%) who were not knowledgeable about medicinal plants for oral health were asked to skip the remaining questions in the first part of the questionnaire and to proceed to the second part.

Among 147 participants who are knowledgeable on medicinal plants for oral health, the majority of them knew of their existence due to friends and acquaintances (128, 87.07%), followed by family traditions (121, 82.31%), and discovery through various media such as newspaper, magazine, and social media sites (45, 30.61%).

The most known medicinal plant for oral health among the respondents was garlic (144, 97.96%), followed by guava (52, 35.37%), hierba buena (12, 8.16), and tsaang-gubat (4, 2.72). Three respondents (2.04%) mentioned ginger as another medicinal plant for oral health.

For toothache, garlic was recognized among all respondents who selected garlic from the preceding question (144, 100%), followed by guava (42, 82.69%), and ginger (3, 100%). Most of the respondents who selected guava (42, 82.69%) and all respondents who answered hierba buena (12, 100%) and tsaang-gubat (4, 100%) from the preceding question identified the said medicinal plants as a treatment for swollen or bleeding gums. Tsaang-gubat (2, 50%) and guava (2, 3.85%) were known to address fungal infections among their respective respondents. Some respondents who selected garlic (2, 1.37%), guava (10, 19.23%), hierba buena (4, 33.33%), and tsaang-gubat (1, 25%) identified the four medicinal plants as a treatment for canker sores/aphthous ulcers.

Table 1. Demographic Profile of Study Participants

Demographic Profile (N=214)		N (%)
Sex	Male	89 (41.59)
	Female	125 (58.41)
Age (in years)	18-29	110 (51.40)
	30-39	56 (26.17)
	40-49	26 (12.15)
	50-59	22 (10.28)
Civil status	Single	129 (60.28)
	Married	79 (36.92)
	Widowed/Annulled/Separated	6 (2.80)
Highest educational attainment	Elementary undergraduate	0 (0)
	Elementary graduate	4 (1.87)
	High school undergraduate	14 (6.54)
	High school graduate	66 (30.84)
	College undergraduate	57 (26.64)
	College graduate	73 (34.11)
Employment status	Unemployed	93 (43.46)
	Self-employed	19 (8.88)
	Employed	102 (47.66)

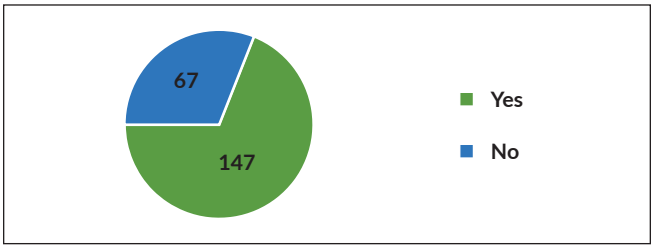

Figure 1. Participants' knowledge on using medicinal plants to address oral health problems (N=214).

Table 2. Summary of Participants' Attitude on Four Medicinal Plants for Oral Health (N=214).

Statements	Responses N (%)	
	Generally Positive (SA +A)	Generally Negative (SD+D)
I believe that medicinal plants are beneficial for oral health just as much as it benefits my overall health	177 (82.71)	37 (17.29)
I believe that medicinal plants for oral health are safe	175 (81.78)	39 (18.22)
I believe that medicinal plants for oral health are effective	175 (81.78)	39 (18.22)
I believe that medicinal herbs are more economic and cheaper than conventional medicines	175 (81.78)	39 (18.22)
I believe that medicinal herbs are easily accessible and ready to be used	171 (79.91)	43 (20.09)
I have never considered using medicinal plants as treatment of oral diseases	38 (17.76)	176 (82.24)
Medicinal plants will do more harm than good to my oral health	39 (18.22)	175 (81.78)
I will recommend using medicinal plants for oral health to my family members and peers	175 (81.78)	39 (18.24)

** SA = Strongly agree, A = Agree, SD = Strongly Disagree, D = Disagree*

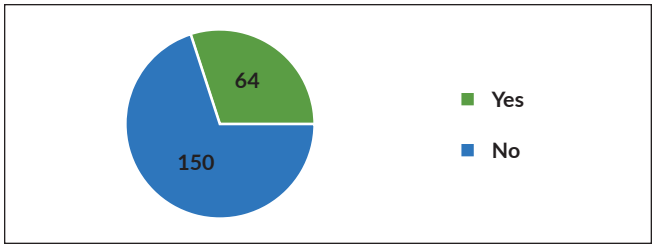

Figure 2. Participants' usage of medicinal plants to address oral health problems (N=214).

Attitude on Four Medicinal Plants for Oral Health

The second part of the questionnaire consisted of eight statements on the participants' attitudes towards the four medicinal plants for oral health. A 4-point Likert scale was used to describe the participants' attitudes (Table 2). One hundred seventy-seven respondents (82.71%) believed that medicinal plants were beneficial for oral health just as much as it benefits their overall health, safe (175, 81.78%), effective (175, 81.78%), cheaper than conventional medicine (175, 81.78%), and easily accessible (171, 79.91%). Only a few participants never considered using medicinal plants as a treatment for oral health (38, 17.76%) and believed that medicinal plants are harmful to oral health (39, 18.22%). Most participants also had a generally positive attitude toward recommending medicinal plants for oral health to their family members and peers (175, 81.78%).

Practices on Four Medicinal Plants for Oral Health

The third part of the questionnaire consisted of six questions about the participant's practices on four medicinal plants for oral health. Of the 214 respondents, only 64 (29.91%) personally used medicinal plants to address their oral health problems (Figure 2). The 150 respondents (70.09%) who did not use medicinal plants for oral health were asked to skip the remaining questions in the third part of the questionnaire and to proceed to the last part of the questionnaire, an online brochure on the four medicinal plants which the participants were able to screenshot and save for future reference.

Among 64 participants who used medicinal plants for oral health, the majority of them used garlic (62, 96.87%), followed by guava (26, 40.62%), hierba buena (5, 7.81%), and tsaang-gubat (2, 3.12%). Aside from the four medicinal plants, two respondents (3.12%) used ginger as a medicinal plant for oral health.

All respondents who used garlic (62, 100%) and ginger (2, 100%) prepared the said medicinal plants through direct application. Respondents who used guava utilized the plant's leaves (26, 100%) and branches (11, 42.31%) either through decoction (25, 96.15%) or direct application (7,26.92%). Participants who used tsaang-gubat utilized the plant's leaves (2, 100%), while those who used hierba buena utilized the plant's leaves (5, 100%) and branches (3, 60%). Both tsaang-gubat and hierba buena were prepared through decoction (5, 100% and 2, 100%, respectively).

Garlic and ginger were used for toothache among all respondents who selected the said medicinal plants (62, 100% and 2,100%, respectively). Guava was used for all oral health conditions in the choices, namely toothache (18, 69.23%), bleeding gums (24, 92.31%), aphthous ulcers (3, 11.54%), and fungal infections (3.85%). Hierba buena was used for bleeding gums (5, 100%) and aphthous ulcers (2, 40%), while tsaang-gubat was used for bleeding gums only (2, 100%).

DISCUSSION

Approximately 1,500 of more than 13,000 plant species in the Philippines have been identified with medicinal value, and there is a great probability that people in rural and urban communities use some of these plants.[10] With the approval and endorsement of the Department of Health - Philippine Institute of Traditional and Alternative Healthcare (DOH-PITAHC) on ten scientifically medicinal plants as alternative medicine, the plants' contributions to the medical field and

their effect on the population are recognized.[11] Among the endorsed ten medicinal plants, four (garlic, guava, tsaang-gubat, and hierba Buena) are indicated for treating oral diseases and maintaining oral health.[12]

Although there are studies on knowledge, attitudes, and practices (KAP) on medicinal plants in the Philippines, there are few to no studies on medicinal plants for oral health.[10,11] This study aimed to determine the knowledge, attitude, and practices of Oral Medicine patients on the four medicinal plants for oral health by employing a self-administered online questionnaire (Google Forms).

The duration of data collection was extended to six (6) months. The continuance of data collection from the anticipated six (6) weeks was due to a low response rate which could be attributed to the following: (1) a change in the patient's contact details; (2) lack of interest in participating in the study; (3) patients thought it was a spam message from an unknown number; and (4) online participation is only limited to patients with stable internet connection through sim data or Wi-Fi and gadgets such as smartphone, tablet, desktop computer, and laptop. Most of the patients did not immediately respond to the first invitation. Hence, the text messages were sent to these patients twice until the sample size was met. Additionally, the participants were able to answer the questionnaire within approximately 5-10 minutes, which was shorter than the anticipated 15-20 minutes.

Knowledge on Four Medicinal Plants for Oral Health

Medicinal plants were initially used to treat medical conditions. However, due to their antiseptic, analgesic, antimicrobial, and antifungal properties, there was an emerging trend of using medicinal plants in treating dental conditions such as toothache, periodontal inflammation, and oral diseases.[13] In this study, most respondents (147, 68.69%) had knowledge on using medicinal plants to address oral health problems.

Most of the participants knew the existence of medicinal plants for oral health due to interaction among family and friends. Close friendships and family ties among Filipinos significantly influence a person's way of living, particularly in knowledge of medicinal plants that were kept alive and passed down across generations.[11] However, in some cases, knowledge of medicinal plants increases due to the emergence of social media posts and advertisements.[14]

Of the four medicinal plants, garlic and guava were known among the participants. This is comparable to Tolentino et al.'s study, where garlic and guava were also acknowledged as treatments for oral health problems. Garlic is one of the most widely used medicinal plants in the Philippines and is commonly found in Filipino households as a preservative and flavoring for food preparations.[11] Guava is also commonly seen and grown for its edible fruit and antiseptic activity in treating wounds, ulcerations, and infections.[11] Hierba buena and tsaang-gubat are seldom heard of or encountered particularly as a treatment for oral health because they are more known as analgesic and antispasmodic, respectively.[12] Aside from the four medicinal plants, some participants also mentioned ginger. Although it is primarily used for pain relief, it can also address toothache.[12]

The participants selected garlic, guava, and ginger as treatments for toothache. The active compounds, namely allicin in garlic, guaijaverin in guava, and gingerol in ginger, have inhibitory activity against oral streptococci, notably *Streptococcus mutans* (*S. mutans*), which play a significant role in dental caries and bacteremia.[15-17] The antibacterial effect causes pain relief in the affected tooth.

Guava, hierba buena, and tsaang-gubat were identified as a treatment for swollen or bleeding gums. Guava was found to have antiplaque activity by reducing the adhering capacity of pellicles on the tooth surface during early plaque formation.[17] The aqueous extracts from guava, hierba buena, and tsaang-gubat exhibit antibacterial properties and inhibition of periodontal pathogens such as *Aggregatibacter actinomycetemcomitans*.[17-19]

Tsaang-gubat and guava were chosen for fungal infections. The flavonoid and tannic fractions from guava and alcohol extracts from tsaang-gubat exhibited antifungal capacity by inhibiting colony formation.[18,20]

All four medicinal plants were known as treatments for canker sores/aphthous ulcers. Using mouth rinses from guava and garlic extracts showed a faster and more significant reduction in ulcer size, pain, and erythema.[21,22] Although there are no studies on hierba buena and tsaang-gubat for aphthous ulcers, bioactive compounds in both plants exhibited antibacterial and wound healing properties, which are beneficial in addressing oral lesions.[18,23]

Attitude on Four Medicinal Plants for Oral Health

Most participants had a generally positive attitude toward medicinal plants for oral health and were deemed beneficial. The majority of the world's populace depended on traditional medicine for their primary healthcare needs because the plant extracts were readily accessible, affordable, and culturally appropriate.[13]

Many participants also believed medicinal plants were safe, effective, easily accessible, and cheaper than conventional medicine. Medicinal plants are safe if prepared hygienically. Far-flung areas having difficult access to health centers make medicinal plants more effective as alternative medicine.[11] Medicinal plants are abundant and can be easily grown in the backyard without maintenance. Moreover, medicinal plants are not harmful and can be used as an alternative medicine when there are reasons or hindrances in seeking immediate modern medicine.[24] In a study in Saudi Arabia, participants who used medicinal plants for oral conditions stated that the remedies were generally moderately effective to effective and had fewer side effects than conventional medications.[25]

Some participants believed medicinal plants are harmful and had never considered using medicinal plants as a treatment for oral health. In a study among dental patients in Turkey,

participants regarded medicinal plant-based products such as toothpaste and mouthwash as safe and useful in preventive dentistry.[14] However, precautions must be taken, particularly in patients taking medications, since some plant compounds are toxic and might negatively interact with the drugs.[14]

Most participants who also had a generally positive attitude on recommending medicinal plants for oral health to their family members and peers were correlated studies who noted that dental patients were willing to use natural and holistic treatments such as medicinal plants to treat oral diseases because the benefits outweigh the risks.[14,25]

Practices on Four Medicinal Plants for Oral Health

Despite the high level of knowledge among participants, only 64 (29.91%) personally used medicinal plants for oral health. Medicinal plants are used because of their accessibility, affordability, and effectiveness.[24] However, the higher level of usage is attributed to the availability of medicinal plants in their locality and is more evident in rural than urban areas.[10]

Garlic and guava were the most used medicinal plants for toothache and gingival conditions, respectively. Garlic bulbs and ginger were either eaten raw or chewed and applied directly on the painful tooth or affected area of the oral cavity.[11] The decoctions of guava, tsaang-gubat, and hierba buena were used as gargles and were acquired by boiling the plant parts in water until the water volume was reduced to a minimum or the required amount.[26]

CONCLUSION

The study's results suggest that most participants were knowledgeable and had a generally positive attitude toward the four medicinal plants for oral health but did not use and prepare them to address their oral health problems. It should also be emphasized that the study's results are only generalizable to the study's target population (Oral Medicine patients) and cannot be applied to the general population.

Since the study is purely descriptive, it is recommended to delve into further similar research that determines the statistical correlation between the knowledge, attitude, and practices on the four medicinal plants for oral health. In addition, it is recommended to increase the number of participants by including the other clinical sections in the Clinical Dental Department. A face-to-face administration of questionnaires is also more ideal since it yields a higher and faster response rate as compared to online questionnaires. Physical information, education, and communication (IEC) materials should be given to the participants since IEC materials on medicinal plants for oral health are currently unavailable in the college.

With the study demographics yielding high level of knowledge and positive attitude but low usage on four medicinal plants for oral health, it is also recommended to conduct further studies on the effectiveness, drug interactions, and toxicity of four medicinal plants for oral health which may pave way for possible production of herbal-based medicine for oral health.

Statement of Authorship

Both authors certified fulfillment of ICMJE authorship criteria.

Author Disclosure

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