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Enhancing Holistic Health Literacy among the Indonesian Diaspora in Malaysia using Traditional Indonesian Spices

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ABSTRACT

This community service program aimed to improve knowledge, perceptions, and behaviors of the Indonesian diaspora at the Sungai Mulia Learning Studio (SBSM) in Kuala Lumpur, Malaysia, regarding the use of traditional spices for health. The program involved counseling, demonstrations, and completion of an evaluation questionnaire using a Likert scale and open-ended questions. Twenty-three participants took part in the activities and evaluations. The results showed high levels of knowledge and positive perceptions, especially in participants' belief in the health benefits of traditional spices and their understanding of the functions of basic spices such as ginger and turmeric, commonly used as traditional medicines. Although some participants still chose modern medicine as their main option, they demonstrated a positive attitude toward herbal remedies. Behavioral analysis indicated a strong tendency to prepare, consume, and seek information about spices after attending the program. Qualitative findings supported these results; most participants stated that the activities were beneficial, broadened their insight, and encouraged habit changes toward greater use of herbal medicine. All participants also expressed willingness to join follow-up programs. Overall, this program effectively improved spice-based health literacy and has the potential to be scaled up through more intensive practical sessions and provision of guidance materials.

INTRODUCTION

Indonesia is known as one of the world's spice diversity centers. Plants such as turmeric (*Curcuma longa*), ginger, temulawak, and lemongrass are not only used as cooking spices, but have also been used for a long time in traditional medicine. The active content of turmeric in the form of curcumin has been shown to have strong anti-inflammatory and antioxidant activity [1]. Curcumin is also reported to have a protective effect on gastric epithelial tissue through cellular anti-inflammatory mechanisms [2]. Other studies have shown that the bioactive compounds in turmeric rhizomes have the potential to be antibacterial and immunomodulatory agents, thus supporting their use in public health promotive-preventive efforts [3,4].

Other spices such as ginger and temulawak also have similar properties. Community service in North Sumatra, for example, shows that training in making spice-based herbal drinks can increase public understanding of the benefits of natural antioxidants as an immune booster [4]. This reinforces that spice literacy is not only part of cultural heritage, but also relevant to support physical health scientifically.

On the other hand, international students, including the Indonesian diaspora in Malaysia, face complex challenges. Research in Malaysia shows that more than half of international students experience moderate to severe stress due to academic pressure, cultural adaptation, and limited social support [6]. This form of stress is known as acculturative stress, which is stress that arises due to the process of cultural adjustment when living in a foreign environment [7]. Academic stress has also been shown to be significantly related to students' psychological well-being; academic self-perception is even a strong predictor of their psychological condition [8]. Another study in Sabah,

Malaysia, confirms that academic stress affects students' life satisfaction and can lower their mental well-being if not managed properly [9].

Looking at these two sides of the problem, the great potential of spices for health and the high psychological pressure of diaspora students, a holistic health approach is needed that not only targets physical aspects, but also cultural interactions and mental well-being. This PKM program is designed to answer this need through education, seminars, and workshops about the use of traditional Indonesian spices. This culture-based approach not only improves health literacy, but also strengthens the identity of diaspora students and provides a more natural means of coping skills.

Therefore, the main goal of this program is to improve the literacy and skills of Indonesian students abroad in utilizing traditional spices, as well as support holistic health that includes physical, emotional, and cultural connections. This approach is expected to be a relevant model of intervention for other international student communities.

METHOD

The implementation of the Community Service Program (PKM) is designed using a dialogical education and experiential learning framework, which emphasizes knowledge transformation through active interaction between facilitators and participants. The framework draws on the Freirean approach [10], in which the educational process is conceived as a two-way communication space that enables participants to contribute to the collective construction of knowledge. In addition, practical activities are designed according to the principles of *experiential learning* [11], which views hands-on experience as a key component in the development of conceptual understanding and practical skills.

The activity was carried out at the Sungai Mulia Learning Studio (SBSM), Kuala Lumpur, involving the Indonesian diaspora (parents of SBSM students). The entire series of activities is organized into three methodological stages: the preparation stage, the implementation stage, and the evaluation stage. Each stage is designed to ensure a clear relationship among the activity's objectives, the delivery of the material, and the measurement of impact.

Preparation Stage

This stage begins with preparing educational materials on the health benefits of Indonesian spices and their potential bioactive compounds. The material is designed to have a scientific basis while still being easy to understand for participants with diverse educational backgrounds. In addition to the seminar material, the team also prepared an evaluation instrument in the form of a questionnaire consisting of three parts.

The first part contains Likert-scale questions (1–4) to assess participants' perceptions and basic knowledge, such as beliefs about the benefits of spices, understanding of processing techniques, knowledge of distinguishing between spice types, and awareness of potential side effects. A four-point scale is used to encourage participants to give more assertive assessments, as suggested by the research on the development of the attitude scale by Joshi and colleagues [12].

The second part contains Likert-scale questions 1–5 to assess participants' behavioral tendencies, such as consistency in consuming processed spices, making their own herbs, seeking additional information, and using spices outside the home.

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The third part contains open-ended questions designed to capture participants' reflections on the activity, changes in their views after participating, interest in certain spices, and suggestions for developing further activities. This open-ended question serves to enrich understanding of the impact of activities through personal experience.

Implementation Stage

The implementation of activities consists of two main forms of intervention:

1. Interactive Seminar

The seminar was held in a dialogical manner, combining the delivery of material and discussion, as shown in Fig. 1. Participants were invited to share their experiences with spices in their daily lives, which made the activity more contextually relevant and facilitated knowledge exchange among participants. The seminar material covers bioactive compounds in spices, their health benefits, and examples of their use in making herbal drinks. This interactive approach aligns with the concept of participatory learning, which emphasizes collaboration between facilitators and participants to build a shared understanding [13].

Figure 1. Presentation of the interactive seminar

2. Spice Compounding Workshop

After the seminar, participants took part in a workshop on the practice of mixing simple herbal drinks. This session is designed to allow participants to experience firsthand the process of recognizing aromas, textures, and spice-processing techniques.

Figure 2. Media of the training and presentation

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Activities are carried out in groups to encourage collaboration and discussion. Participants learn to select, clean, cut, and brew spices such as ginger, turmeric, and lemongrass. This experiential learning follows the experiential learning model [10], in which knowledge is built through a cycle of direct experience, reflection, and meaning.

3. Evaluation Stage

Program evaluation is carried out using a questionnaire prepared at the planning stage.

a. Quantitative Analysis

Data from the Likert-scale items were analyzed using descriptive statistics, which calculated frequencies, percentages, and averages to describe participants' perception tendencies. This method is suitable for evaluative research that aims to provide an overview without conducting an inferential test [14].

b. Qualitative Analysis

Open-ended answers are analyzed using thematic analysis, a process that identifies patterns, categories, and themes in qualitative data. The analysis was carried out following the steps outlined by Braun and Clarke [15], starting with repeated reading of the data, conducting initial coding, grouping codes into themes, and compiling a narrative interpretation.

The thematic analysis was chosen because it could capture participants' sentiments more deeply, especially regarding the benefits of the activity and their personal reflections on their experience with spices.

All participants voluntarily participated in the activity and received an explanation of the purpose of data collection. The identities of respondents who completed the questionnaire were not included in the report, and the data were used only for evaluation and article writing.

RESULTS AND DISCUSSION

A total of 23 participants filled out an evaluation questionnaire after the activity. This number is sufficient to describe the participants' responses because all participants in the activity (100%) completed the instruments. With this number of respondents, data interpretation can be carried out more convincingly, especially by examining trends in average scores and the patterns of perceptions that emerge.

Participant's Perception And Knowledge

This section discusses participants' response patterns to nine indicators of perception and knowledge regarding the use of Indonesian spices. The analysis was carried out based on the mean score and score index, which were then interpreted in light of the literature on health perception, herbal knowledge, and the use of natural ingredients in Indonesian society.

In general, participants showed a strong appreciation and interest in spices. However, some aspects of knowledge still need strengthening, especially those related to the safety of using spices and their functions at a more specific biological level.

An overview of participants' perceptions and knowledge-value trends is shown in the following mean and score index charts in Fig. 3.

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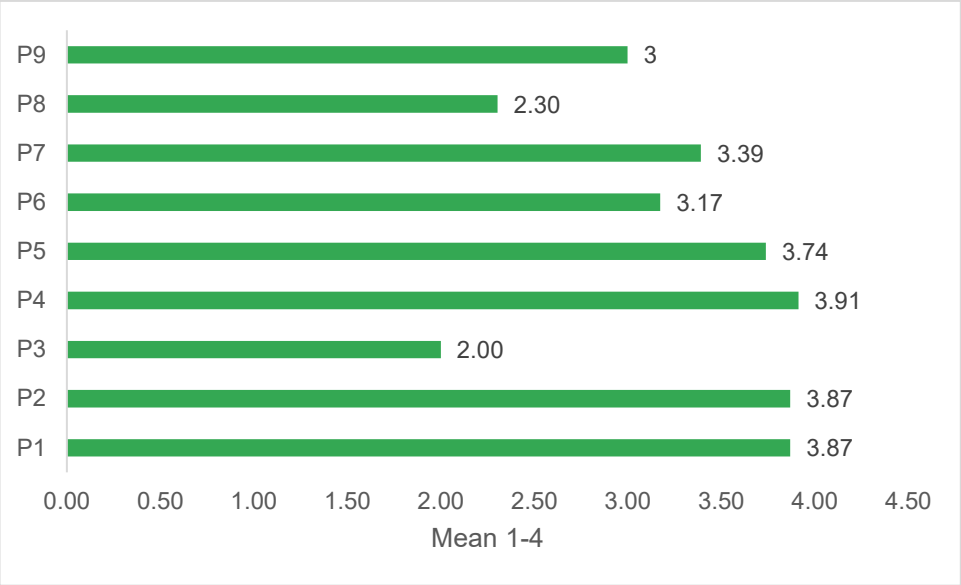

Figure 3. Average Likert Score of 1–4 on the Perception and Knowledge Indikator

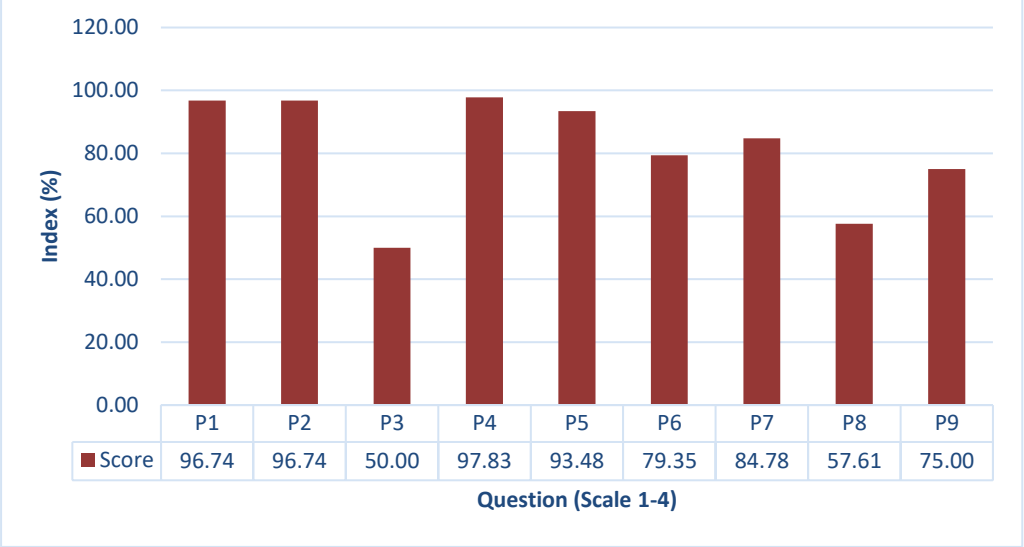

Figure 4. Perception and Knowledge Indicator Score Index (0–100%)

In general, both charts show a pattern of responses that tend to be high across most indicators, with variations in certain aspects that require strengthening.

1. *Perception of the Benefits of Spices (P1-P4)*

Indicators P1 and P2 obtained very high scores (index: 96.74%; mean: 3.87), indicating that almost all participants (21–22 people) believe in the health benefits of spices and the importance of maintaining health through a natural approach. This aligns with the literature, which states that traditional medicine, including spices, is an integral part of Indonesian public health practices [16].

The P4 indicator had the highest score (*index: 97.83%; mean: 3.91*), indicating that participants had a strong desire to study spices in greater depth. An activity approach that incorporates hands-on demonstrations seems to play a big role in the moment. Unlike the three indicators, P3 has the opposite construction as its statement reads: "*I believe in modern medicine more than traditional spice-based medicine*." With an index of 50% (mean 2.00), a low score indicates that participants did not view modern medicine as the

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only option and were quite open to spice-based treatments. About 11–12 participants showed a more balanced preference. Findings like these are common in urban and semiurban societies, where the use of spices is more often positioned as a complementary, rather than a substitute for medical treatment [17], in line with the concept of *experiential learning* [10].

Knowledge of the Functions and Uses of Spices (P5-P7)

The P5 indicator showed strong basic knowledge (*index of 93.48%*), indicating that most participants (20–21 people) already knew the benefits of common spices such as turmeric, ginger, curcuma, and lemongrass. This is natural because the spice is often encountered in daily life.

The P6 indicator has a more moderate index (*79.35%; mean 3.17*), indicating that technical capabilities in processing spices are not evenly distributed. About 6–7 participants still did not seem to understand the correct processing procedures. This kind of technical knowledge does require direct exposure [18].

The P7 indicator (*index of 84.78%*) showed a strong ability to identify spices in general, although specific differentiation between types may still require additional training.

2. *Risk Identification and Security Aspects*

The index chart shows that P8 had the lowest value (*57.61%; mean 2.30*), indicating that only about 8–10 participants understood that excessive spice use can cause side effects. To clarify this pattern, the distribution of the answers can be placed as follows:

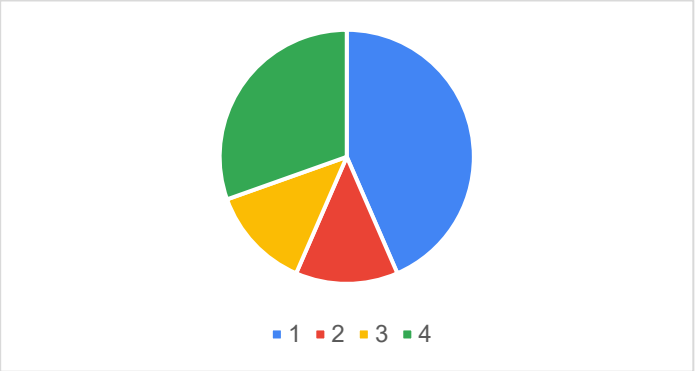

Figure 5. Distribution of Answers on Indicator Question 8 (Spice Side Effects)

The literature shows that many people have a misconception that "natural ingredients are definitely safe", even though some spices have clear consumption limits and can affect drug interactions [19].

The P9 indicator (*75%; mean 3.00*) showed that two-thirds of participants understood the role of spices in maintaining immunity and metabolism, but did not yet fully understand their biological mechanisms.

3. *Synthetic Findings Perception and knowledge*

The findings of all indicators are as follows: Participants' perceptions are very positive, supported by strong confidence and high interest in learning; Basic knowledge is quite good, especially on commonly used spices; Technical knowledge and understanding of

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risk are areas of weakness, so more emphasis needs to be placed on the next activity; A low P3 score is positive, as it indicates openness to traditional medicine.

Participant's Behavior And Practice Intensity

This subsection discusses how participants use or plan to use spices in their daily lives. Five behavioral indicators (B1–B5) were analyzed based on the mean Likert scale score and the score index to assess the level of behavioral adoption after participating in the activity. An overview of the participants' behavior patterns is shown in the following graph:

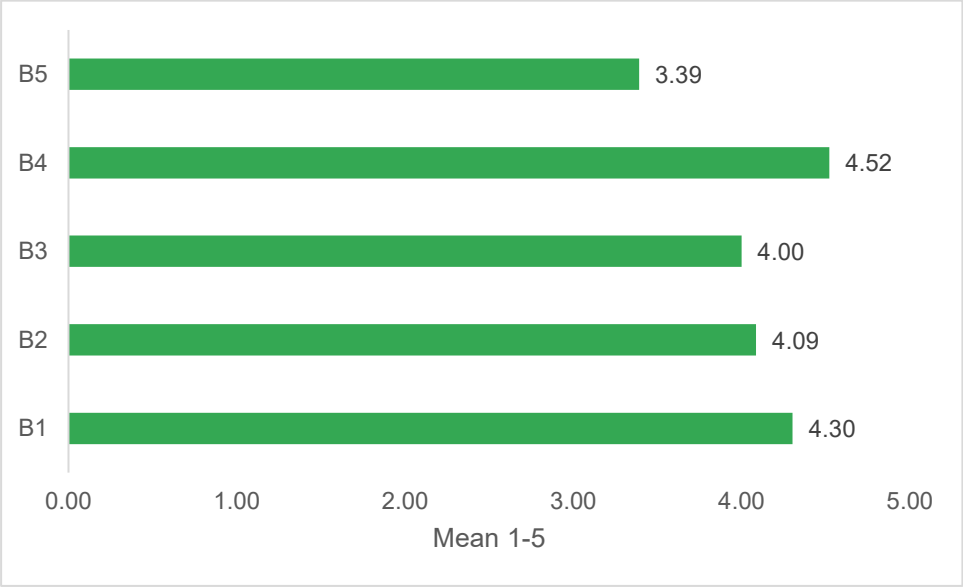

Figure 6. Average Likert Score (1–5) on Behavioral Indicators and Practice Intensity

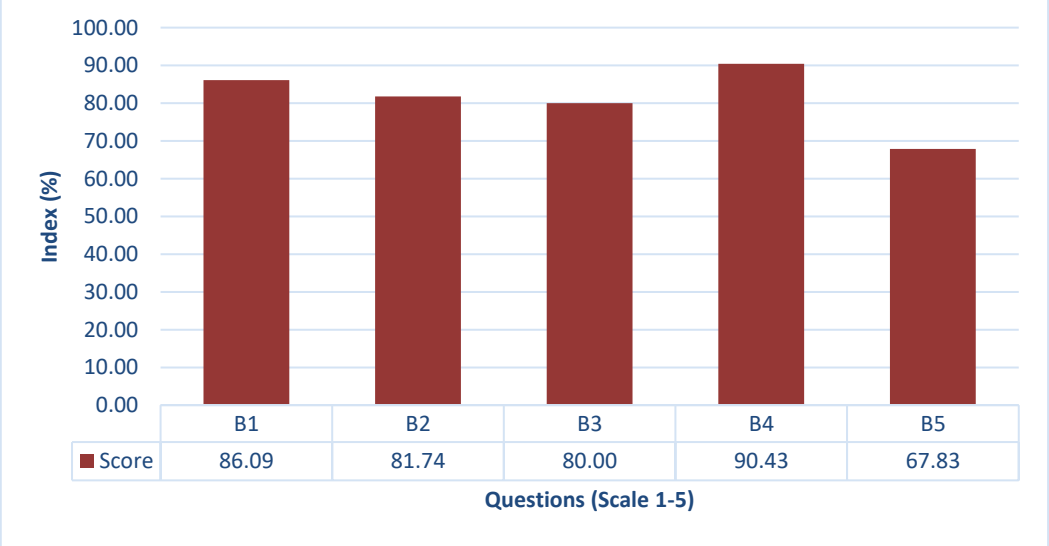

Figure 7. Participant Behavior Score and Practice Intensity Index (0–100%)

Overall, the mean value of all indicators is 3.39 to 4.52, with the score index ranging from 67.83% to 90.43%. This shows that the participants' behavior falls in the quite high to very high range, indicating an intention to act that is beginning to turn into actual practice [20].

1. *Highest Scoring Indicator: Information Search (B4)*

Indicator B4 obtained the highest score (mean 4.52; index 90.43%). This showed that almost all participants (about 21–22 of 23 respondents) had a strong urge to seek additional information about spices. The high interest in seeking information can be attributed to two things:

a. Direct educational exposure through activities that allow participants to see, touch, and process spices in real life, an experiential learning factor that has been proven to increase interest in further exploration [10].
b. Cultural and health contexts, where Indonesian people are increasingly aware that spices have functional value that can boost the immune system [15].

A high score on information retrieval is an important indicator in the process of changing health behavior, as it serves as a foundation before individuals take more specific actions [16].

2. *Spice Consumption Behavior (B1)*

Indicator B1 had a mean of 4.30 and an index of 86.09%, indicating that most participants have regularly consumed processed spices. This aligns with the growing trend of using herbal ingredients as a preventive health strategy, especially post-pandemic, when people pay more attention to immunity [17].

3. *Social Behavior (B3)*

Indicator B3 shows a mean of 4.00 and an index of 80%, indicating that many participants have begun to act as information agents in their environments. This shows a positive social diffusion *effect*, in which health behaviors begin to spread through natural social interactions.

4. *Independent Behavior (B2)*

Indicator B2 has a mean of 4.09 with an index of 81.74%. This value indicates that most participants have the initial willingness and ability to make processed spices at home. However, scores that are not as high as B4 or B1 suggest that technical skills still vary, perhaps because not all participants are used to concocting herbal ingredients. This aligns with the findings on the P6 technical knowledge indicator, which indicate a moderate understanding of spice processing.

5. *Lowest Indicator: Outdoor Use of Spice Products (B5)*

B5 has the lowest score (mean 3.39; index 67.83%). This shows that participants often consume spices in a household context, but have not fully made it a choice when they are outside the home, for example choosing herbal drinks at restaurants, shops, or buying ready-to-consume products. This score is reasonable because decisions to consume outside the home are often influenced by factors other than health, such as taste, product availability, or price.

6. *Synthetic Behavior*

In summary, high scores on B1, B2, B3, and especially B4 indicate that participants are at the stage of strong behavioral adoption, both personally and socially. The lowest score on B5 indicates the need for additional interventions to better recognize and choose spice products outside the home. These behavioral findings are consistent with perceptions

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and knowledge findings, showing that the activity has succeeded in triggering the intention to change and has begun to be realized in practice.

Reflections And Impacts

Analysis of the open-ended answers of 23 participants was conducted inducively by reading all responses repeatedly to identify patterns of meaning that appeared consistently. This approach is carried out through the following steps: data familiarization, coding, thematic grouping, and interpretation of findings [14]. Through this process, five main themes emerged that describe the participants' experience: (1) perception of the activity, (2) the most interesting spice and the reason, (3) the plan for changing habits, (4) suggestions for the development of the activity, and (5) willingness to participate in the next activity.

An analysis of open-ended answers showed that this activity was not only very well received, but also triggered real changes in participants. They gain new understanding, reinforce old knowledge, foster an interest in various spices, and demonstrate a readiness to change their health habits. In addition, participants provided constructive suggestions for developing activities and fully supported the program's sustainability. Overall, open-ended answers showed a strong impact of activities on cognitive, affective, and behavioral intent aspects.

1. *Pesert's Evaluation of Activities: New Knowledge, Strengthening Understanding, and Enthusiasm*

Most participants rated this activity as a rewarding experience and provided additional knowledge. Phrases like "Very good," "Very useful," "Lots of knowledge," "Adds knowledge," "Very helpful," appear repeatedly. Some participants even specifically stated that this activity helped them "get to know more about the ingredients that can be made in herbal medicine" or "gain knowledge in making herbal medicine."

This shows that the material provided is relevant to the needs of the participants, especially since some of them have used spices but have not yet understood the variations and techniques of their use.

There was one response that was neutral ("Normal"), but proportionately this did not change the general impression that the activity was received very positively. Two participants did not give an answer, which could be due to absence or limited filling time.

The consistency of positive responses indicates that this activity provides a meaningful learning experience, not just delivers information.

2. *The Most Interesting Spices: A Tendency to Familiar Spices with Direct Physiological Benefits*

When asked to name the most interesting spices, the patterns that appeared were very clear, participants tended to choose spices that they understood the benefits of directly or that were familiar in their kitchens. From the data, the most frequently mentioned spices are:

a. Ginger

Ginger is associated with manffat such as refreshing the body, removing the wind, making the body comfortable. These benefits are felt immediately, so it is natural for ginger to elicit a fairly dominant response.

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b. Turmeric and sour turmeric

The reasons for the participants were varied, ranging from "*many benefits*", "*healing wounds*", "*after drinking feeling refreshed*" and "*easy to find*". Turmeric is so embedded in traditional medicine cultures that it's no surprise that it's one of the favorite spices.

c. Kitchen spices in general

Some participants gave answers such as, "*All types of kitchen spices*", "*All spices that can be made into herbal medicine*" and "*All spices are interesting, we want to know more*". This pattern shows strong curiosity about the entire spice group, especially those used in traditional herbal medicine.

d. Other spices (more specific)

Some participants mentioned moringa, cayenne pepper, kencur, and cinnamon, citing health benefits that were also felt directly.

When viewed as a whole, the choice of participants is influenced by several reasons such as the proximity of daily use, the benefits they have felt, and the explanations given during the activity. In other words, spice preferences are not solely based on taste or aroma, but also body experience (*embodied knowledge*).

3. Habit Change Plan: The Emergence of a Desire to Be More Consistent and More Skilled

In the third question, the majority of participants stated that there was a plan to make changes after participating in the activity. Intentions vary, but three main tendencies can be identified.

a. Desire to increase the consumption of herbs/herbs

Some examples of responses related to this are "*I will drink more traditional herbal medicine.*", "*I want to drink herbal medicine every day.*", "*Inshaa Allah I want to be more regular in the habit of drinking herbal medicine.*". This shows that the activity has succeeded in shifting the perception from just knowing spices, to awareness to integrate them into daily life.

b. Desire to make your own herbal medicine or improve the way it is processed

Examples of responses, "*I will try to make herbal medicine for health.*", "*I will improve the way I prepare my homemade herbal medicine.*", "*It will be more diligent to try to make herbal medicine at home.*". This shows that the technical knowledge provided is quite impactful on motivation for hands-on practice.

c. Changes related to personal health reasons

There were two participants who wrote that they had been undergoing medical treatment for a long time but had not seen results, so they wanted to try herbal medicine. This suggests that this activity opens up space for participants to evaluate their own health experiences.

There are several responses that state that there is no change, but the reasons given are logical and experience-based, including because they have routinely used spices or because family medicine patterns are traditional. Thus, the answer "*no change*" indicates that the activity is not failing, but rather that the change is not necessary.

In general, the intentions of participants for change are quite strong and align with the increase in perceptions and knowledge in the previous section.

4. Suggestions for Activity Improvement: Practice Strengthening Requests

Most participants offered suggestions that demonstrated their enthusiasm for the the sustainability of program. Many wish similar activities could be held more frequently, signaling that the program is considered relevant and useful. In addition, participants want more practice, such as cooking or concocting herbal medicine together, to deepen their skills. Some participants proposed the addition of other elements of activities such as yoga and meditation, which demonstrated their openness to holistic health approaches. In addition, the demand for guidebooks appears strong, reflecting the need for study materials that can be taken home and used as references when applying knowledge at home.

5. Willingness to Re-Participate: A Very High Collective Commitment

All participants (23 people) answered YES to the fifth question. No one is rejecting or hesitating. This consistency shows that activities are considered valuable and beneficial, and that the community has strong enthusiasm to continue engaging in health education. In the context of PKM, this level of participation is a very strong indicator of success.

CONCLUSIONS

Service activities involving traditional spices at SKIL have had a positive impact on participants. The quantitative evaluation showed increases in perception, knowledge, and interest in spices, especially turmeric and ginger. Participants also showed a strong tendency to apply this knowledge in daily life, such as making and consuming herbal medicine more regularly. The qualitative findings confirmed that this activity was considered useful, easy to understand, and relevant to their needs, and that all participants provided full support for the follow-up activities. To strengthen its impact, similar activities are suggested to provide more practical sessions, such as demonstrations or workshops on making herbal medicine. Providing simple guidebooks is also necessary so participants have a reference when practicing the material at home. In addition, activities can be developed with a holistic health approach or advanced training for participants who are interested in developing an herbal-based business. With these measures, the program is expected to run more sustainably and provide long-term benefits to the community.

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