

Research Article

Ayur Flex Aroma Head Massager

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Abstract: In this modern era, stress and headache has become the part and parcel of a working professional or student's life. Many suffer from these conditions due to living a high pace and demanding lifestyle thus effecting the quality of their mental and physical health. In fact, most of the people opt for over-the-counter medications to ease their headaches and stress without being concerned about its side effects over the long term. Therefore, the Ayur Flex Aroma Head Massager was designed and developed as it is a massager that integrates traditional herbs and IoT system. Users of this product can get massaged around their neck region while being able to inhale the natural essence of traditional herbs such as Country Borage, Edible Camphor, Sweet Basil, Chaste Tree and Indian Fragrant Rose. A lot of studies have been conducted to show the effectiveness of these herbs in stimulating positive hormones in a person's body. Besides that, the head massager is powered and run by Arduino Nano which in return controls the DC motors that turns the knob to give a massage. The device is set to turn at a speed where the massaging sensation enhances blood flow into the brain. The Ayur Flex Aroma Head Massager was tested by many individuals who reported a boost in their mood and reduction in headaches. The product was promoted on various social media and it garnered a lot of positive feedbacks from its users.

Keywords: headaches; stress; massager; herbs.



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1. INTRODUCTION

According to the World Health Organization (WHO), stress can be defined as a state of worry and tension propagated by difficult situations. It is a natural biological response that causes us to face challenges and adversities. However, the degree of one experience stress varies from individual to individual. In a fast-paced lifestyle, many around the world faces stress from all corners of their life. Those who are mainly affected by stress are working professionals and students. In order to meet the demands of their career or academic progression, many have a poor stress management, sleeping habits, poor diet and lack of exercise. Besides that, due to sitting for a prolonged period of in front of their computers, most developed was in known "tech-neck". This causes them to have poor posture and poor blood circulation to their brain and body which results in headaches, mood swings and ultimately high stress level.

Based on a study by Malaysian Family Physician Association, 42% out of 374 medical students report to having headaches and a whopping 69% out of the 157 that reported to have headaches chose to subdue their headaches by self-medications via painkillers. (Thiagarajan A, Aziz NA, Tan CE, et al,2022). This is a concerning matter as to the negative effects of using painkillers can only be identified after a long period of time. The negative effects ranges from internal stomach bleeding, liver damage, kidney problems, high blood pressure and more.

In an effort to find a more natural and safer method to combat stress and headaches, a product that fuses modern IoT technology and traditional herbs together were studied and created. The Ayur Flex Aroma Head Massager is a device that massages the neck and head region to increase blood circulation and reduces muscular tension. The device is powered and controlled by Arduino Nano which turns the massager knobs to give a massage. Besides that, several herbs were selected based on their natural aroma properties and were placed in the massager. The herbs that were used are Country Borage, Edible Camphor, Sweet Basil, Chaste Tree and Indian Fragrant Rose. Based on a study by (Vismaya Satheesh, Jaspreet Kaur, Singh and Vishesh Bhadariya, et al,2022), the Country Borage's perfume has an anti-anxiety effect which in turn will reduce stress.

2. METHOD & MATERIAL

The Ayur Flex Aroma Head Massager is a device that incorporates IoT system and traditional herbs. Therefore, during the development of this device there are 2 different stages. First, the IoT aspect of the device were developed using components with each components function as below:

Table 1. IoT system main components and functions

Main Components	Functions
Arduino Nano	The brain of the IoT system where it controls the entire operation of the system
L298N Motor Driver	It is a dual H-Bridge motor driver which allows speed and direction control of two DC motors
12V DC motors	It is a rotary motor which can convert the direct current into mechanical energy
Expansion Terminal Adapter	A terminal expansion board that allows wires to be screwed directly to the terminal on the thread and is reliable and convenient.
Rechargeable Battery 12v	DC power supply to the IoT system
Knobs	The knobs have an uneven shape therefore when it spins, it gives a rocking motion which gives massage.



Figure 1. Arduino Nano



Figure 2. L298N Motor Driver

The Arduino Nano is a programmable micro-controller that was programmed using the Arduino IDE software (Leo Louis,2016). It was programmed using the C++ language and the parameters as well as the working principles was included in its coding. The figure below depicts a snippet of the coding that was used.

```

1 //declare pin
2 int MApin1 = 4; //motor A
3 int MApin2 = 5;
4
5 int MBpin1 = 6; //motor B
6 int MBpin2 = 7;
7
8 int MApwm = 9; //motor A speed
9 int MBpwm = 10; //motor B speed
10
11 int Sw1 = 13; //switch
12
13 int val = 0;
14
15 void setup() {
16
17 // declare pin as output and input
18 pinMode(MApin1, OUTPUT);
19 pinMode(MApin2, OUTPUT);
20 pinMode(MBpin1, OUTPUT);
21 pinMode(MBpin2, OUTPUT);
22
23 pinMode(MApwm, OUTPUT);
24 pinMode(MBpwm, OUTPUT);
25
26 pinMode(Sw1, INPUT);
27 Serial.begin(9600);
28
29 }
30
31 void loop() {
32
33 // main code
34 analogWrite(9, 255); //motor A speed value(pin, speed value) --> to change the speed
35 analogWrite(10, 255); //motor B speed value(pin, speed value) --> to change the speed
36
37 val = digitalRead(Sw1);
38 Serial.println(val);

```

Figure 3. Arduino IDE

The diagram below depicts the working principle of the IoT system.

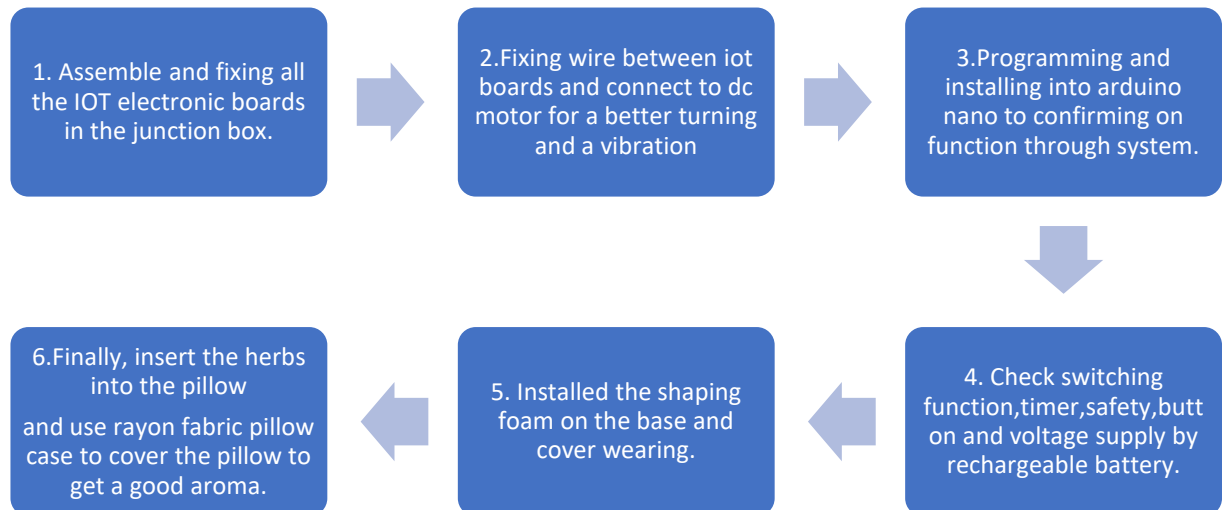


Figure 4. Process of making the Ayur Flex Aroma Head Massager

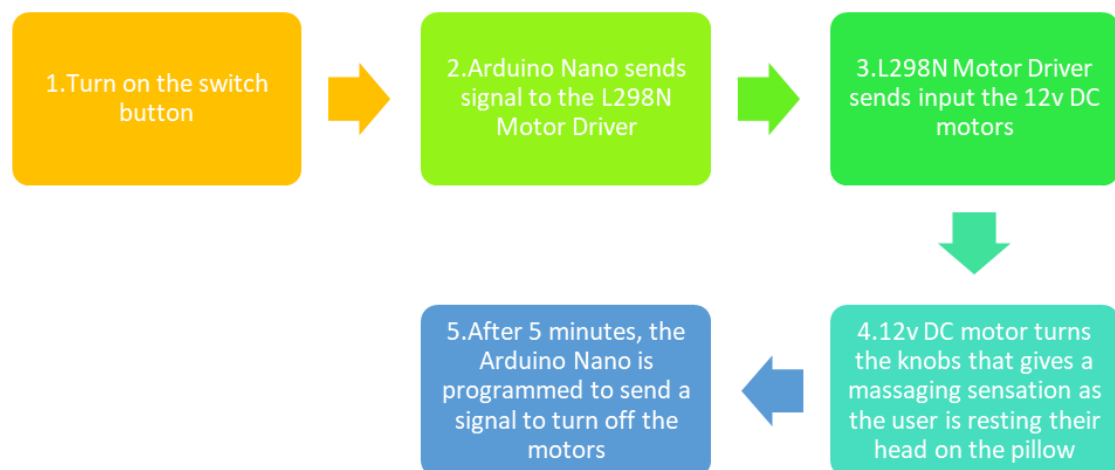


Figure 5. Working principle of IoT system



Figure 6. IoT System Development

The head massager was pre-programmed to run 5 minutes in order to provide the best massaging experience as well as to avoid overstimulation the neck region. Besides that, it also can be stopped if the user deemed that the massaging was enough within the 5 minutes.

The second stage of the device development involves in studying and selecting herbs that has aromatic properties and known for its anti-anxiety effects. The herbs that were used are Country Borage, Edible Camphor, Sweet Basil, Chaste Tree and Indian Fragrant Rose. Each of the herbs are carefully selected for its natural properties. For example, the sweet basil in study by (Bina and Rahimi, 2017) is shown to be an excellent anxiety and stress reducer. These herbs are able to reduce the anxiety levels and boost hormones such as serotonin, dopamine, endorphin and oxytocin.



Figure 7. Country Borage



Figure 8. Edible Camphor



Figure 9. Sweet Basil



Figure 10. Chaste Tree



Figure 11. Indian Fragrant Rose

Below are the scientific names and benefits of each herb.

Table 2. Herbs and its benefits

Herbs	Scientific Names	Benefits
Country Borage	Coleus Amboinicus	It is useful in the treatment of sore throat, congestion, sinusitis. It contains the compounds that act as powerful expectorant which eliminate phlegm and mucus from the respiratory tracts.
Edible Camphor	Cinnamomum Chaphara	Edible camphor has expectorant properties that expel the mucus from the lungs and allow decongested

		breathing. It opens the nasal passageway to allow proper airflow.
Sweet Basil	Ocimum Basilicm	Sweet Basil Essential is reputed to stimulate, clarify, calm, fortify, energize and uplift the mind.
Chaste Tree	Vitex Negunda	Chaste tree increases the concentration. It helps to stimulate hormones like dopamine and oxytocin.
Indian Fragrant Rose	Rosax Damascena	The fragrance of the rose is known to have a relaxing effect on people suffering from stress and anxiety. It helps improve concentration

The herbs were selected and dried. In order to for the scent to suitable for all user, dried leaves were used instead of diffusing essential oil as it can be irritating the airways thus causing allergic reactions. The dried herbs do not contain any addictive that essential oils may contain to prolong its shelf-life. The dried leaves were packed in a sachet bag and was placed within the pillow in the Ayur Flex Aroma Head Massager. The diagram below depicts the work process of selecting the herbs until its end process.



Figure 12. Herbs preparation process



Figure 13. Herbs selection, drying process and sealing the herbs in the sachet



Figure 4. The dried Herbs packed in a sachet

The final product was assembled and developed into a functioning device. The speed and time of the motor spinning were calibrated to ensure the best experience when the users use the Ayur Flex Aroma Head Massager. The sealed sachet was placed within the pillow to ensure the users are able to smell the scent of the herbs.



Figure 15. Ayur Flex Aroma Head Massager

3. FINDINGS

The Ayur Flex Aroma Head Massager was tested by working professionals and students, a total of 111 respondents. Beside each respondent was given an online survey. The main objective of the survey was to find the public's idea and knowledge about the concerning stress levels in our society and find out the effectiveness of the Ayur Flex Aroma Head Massager on their stress and mood. The figure below depicts some of the respondents that tested the Ayur Flex Aroma Head Massager.

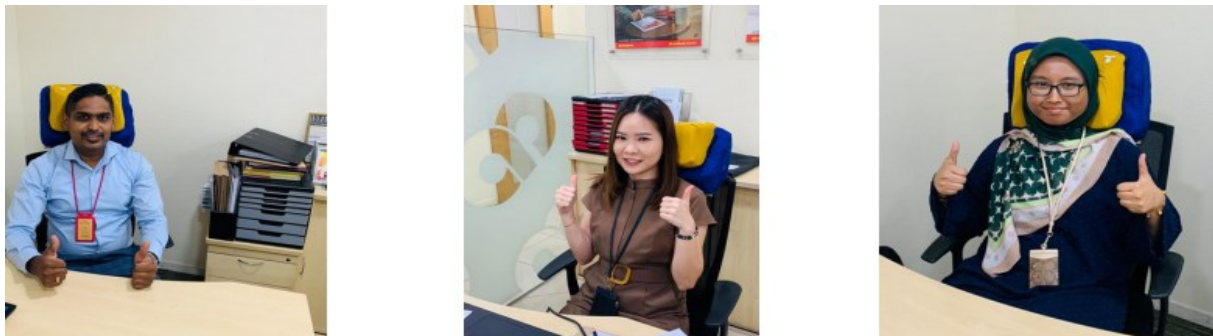


Figure 16. CIMB Bank Staffs with the product

The online survey was done via Google Form and there were 14 questions that was answered by the respondents after the Ayur Flex Aroma Head Massager. Below are the results of the questionnaire.

Question 1 was are you suffering from headache, neck pain or shoulder pain? A total 64.9% of respondents answered yes while the remaining 35.1% answered. 72 out of 111 respondents reported to experience these symptoms.

1. Are you suffering from headache, neck pain or shoulder pain?

111 responses

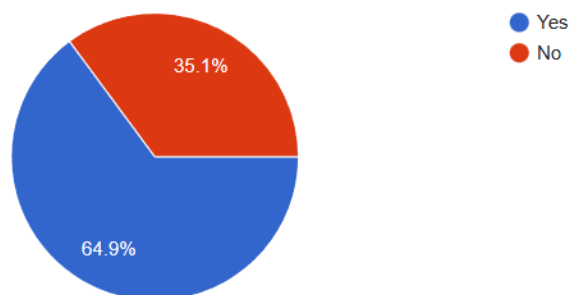


Figure 7. Percentage of respondents with symptoms

Question 2 was about the respondents being aware of the early symptoms of high stress level. 77.5% which is 86 out 111 respondents answered yes while the remaining answered no.

2. Are you aware that this is one of the early symptoms of high stress level?

111 responses

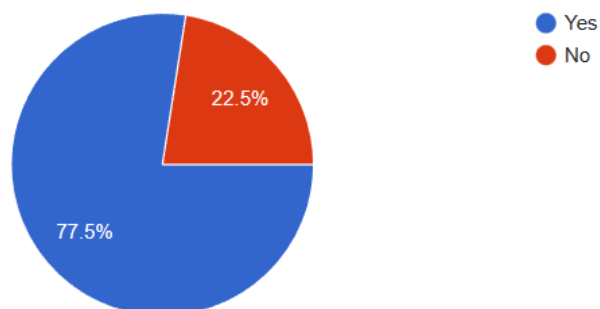


Figure 8.Percentage of respondents awareness of stress

Question 3 depicts whether respondents use painkillers for their symptoms. 67.6% of the 111 respondents claimed that they do use some form of painkillers to alleviate their headaches.

3. Do you consume painkillers to alleviating headache, neck and shoulder pain?

111 responses

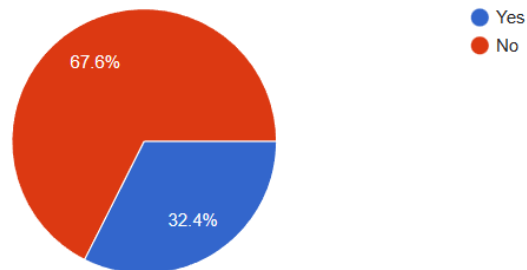


Figure 19.Percentage of respondents that consume painkillers

Question 4 was asked whether respondents know about the side effects of the painkillers. 101 out of the 111 respondents answered yes about knowing the side effects of the painkillers.

4. Are you aware that pain killers do have some side effects?

111 responses

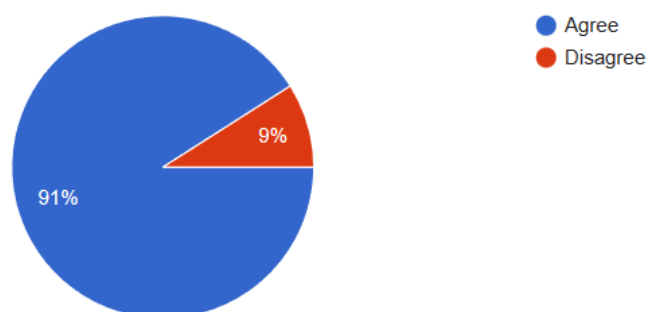


Figure 20. Percentage of respondent's awareness of painkiller side effects

Question 5 outlines whether respondents believe on the effects of massages. 82.9% agrees while 16.2% are unsure. However, a mere 0.9% does not agree.

5. Do you believe that massaging head and neck muscles will provide great relief from stress after a hard day's work?

111 responses

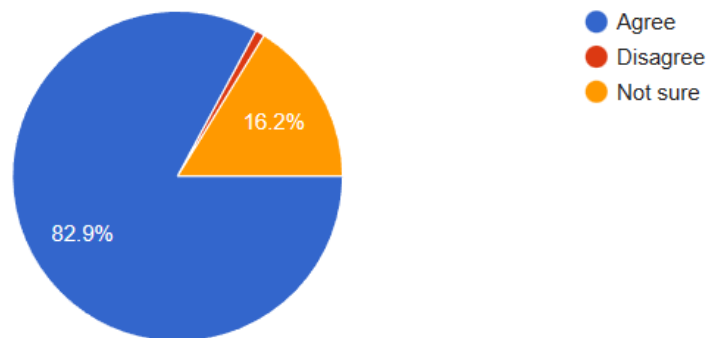


Figure21.Percentage of respondents believe on massager effectiveness

Question 6 describes whether respondents have tried a head massager. 50.5% which is 56 out of 111 respondents said no.

6. Have you ever tried head massager as a source of pain relief?

111 responses

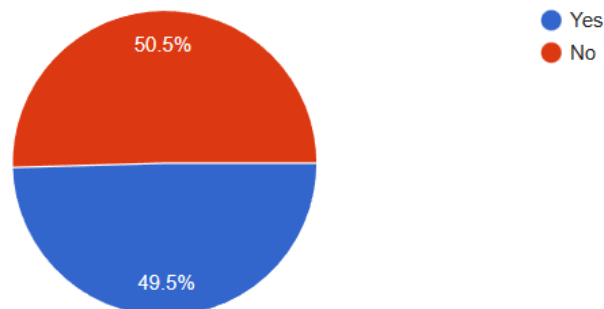


Figure 22. Percentage of respondents with experience of using massager

Question 7 was about the respondents' knowledge about the benefits of herb. 81.1% of the respondents said yes and 16.2% said they were unsure. The rest said no.

7. Are you aware that herbs have some amazing superpowers which can help to focus, help with anxiety, or simply lift your mood?

111 responses

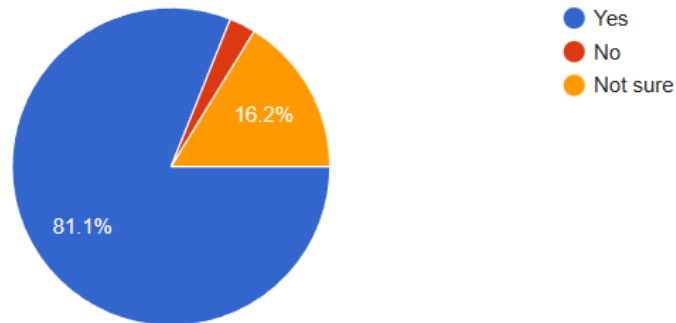


Figure 23. Percentage of respondents with awareness on herbs benefits

Question 8 depicts the source of their information regarding the benefits of herbs. A majority answered family and friends while 23.4% mentioned social media. 16.2% was from health websites and the rest was mass media along with printed media,

8. If yes, which source provided you with the information for question 7?

111 responses

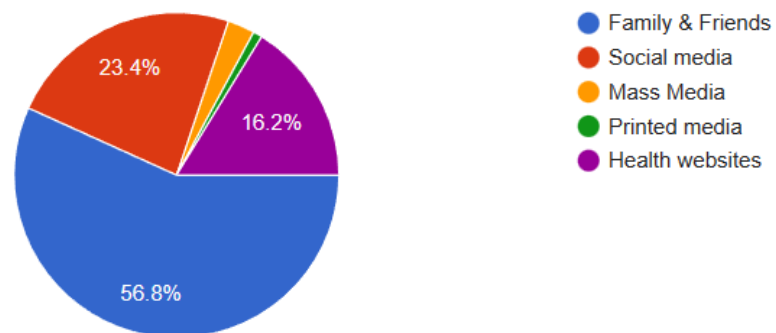


Figure 24.Percentage of respondents on their information source

Questions 9 defines whether Ayur Flex Aroma Head Massager gives out a stronger herbs' aroma. 67.6% agrees while 9.9% strongly disagree.

9. This head massager with the aroma of herbal gives me more relaxation than normal head massager.

111 responses

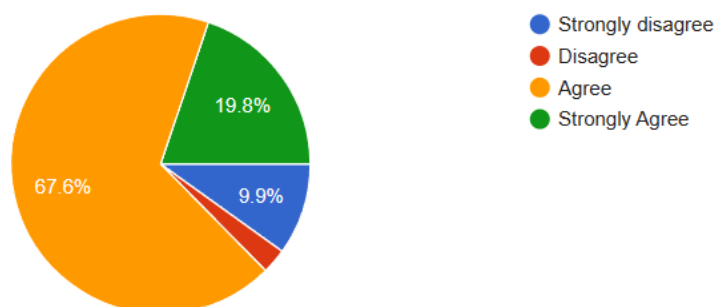


Figure 25.Percentage of respondents on the products comments

Question 10 outlines what the respondents like about the product. A majority answered that the aroma and pain relief was their favourite aspect of the product.

10. What do you like about the product? (you can choose more than 1)

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111 responses

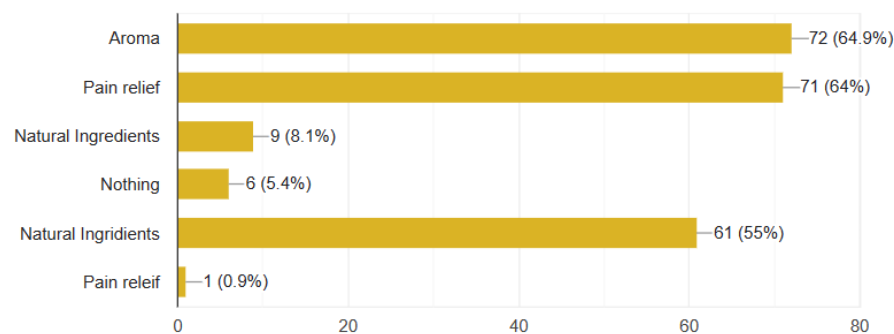


Figure 26.Percentage of respondents' preference on the product

Question 11 depicts whether the respondents will recommend the Ayur Flex Aroma Head Massager. 91.9% said yes while 7.2% were not sure.

11. Would you recommend this product to your friends/others?

111 responses

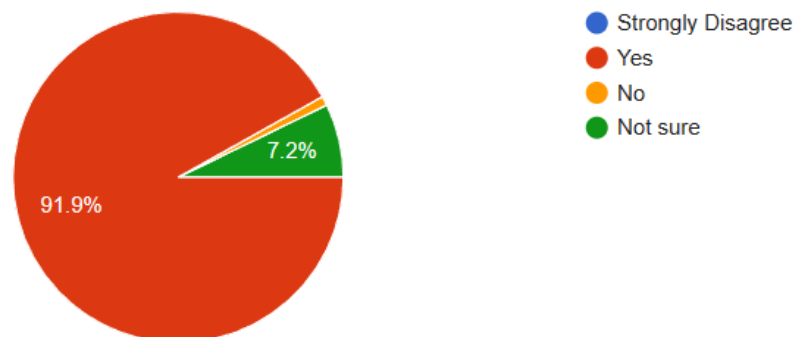


Figure 27. Percentage of respondents' recommendation

Question 12 describes whether the respondents will purchase this product. 97.3% of the 111 respondents said will definitely purchase this product if it is available in the market.

12. In the future, if this product is available in the market, will you purchase this product?

111 responses

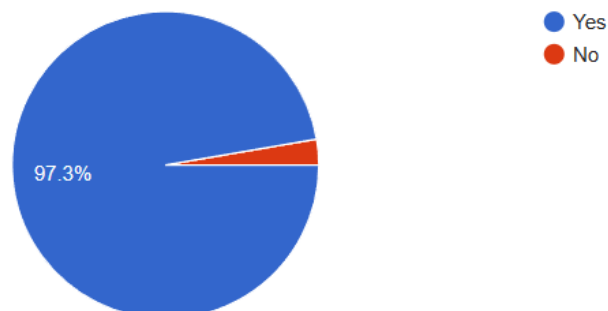


Figure 28. Percentage of respondents' reason for question 12

Question 13 outlines the reasoning as to why the respondents will purchase the product. The reason is to relief pain and followed by herbs are not harmful. Besides that, some of the respondents prefers to use a natural product.

13. Based on answer for question 12, can you explain why?

111 responses

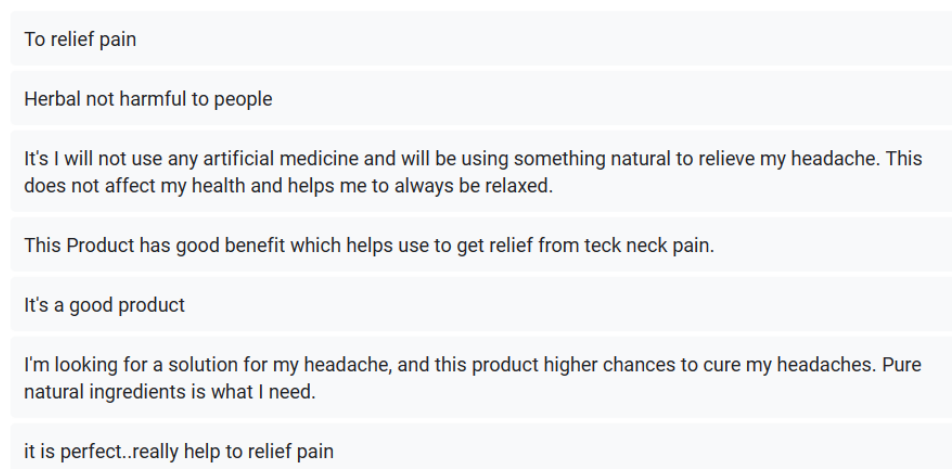


Figure 29. Percentage of respondents' opinion on product

Question 14 outlines respondents' suggestion to improve the product. Most of the respondents believe that the product is working perfectly the way it does as of now. Besides that, some wants more study to be done on this item.

14. Do you have any suggestions or comments to improve the quality of our product? Please add if any:

80 responses

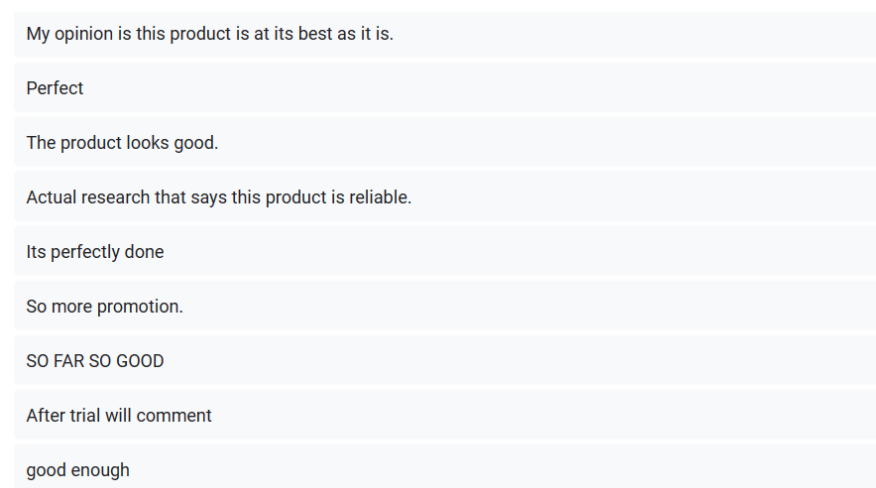


Figure 30.Percentage of respondents' suggestions

4. DISCUSSION

Based on the survey and reviews that was received after the respondents used the Ayur Flex Aroma Head Massager, it is safe to say the product is a success. It is beneficial to reduce stress,

headaches, moodiness and most importantly it was able to relieve the headaches of the respondents. 75 out of the 111 respondents agrees that the product relieved their headaches after using it. This product is lightweight and portable which makes it suitable for working professional to bring it during their travel. Also, the use of natural herbs doesn't bring any negative side effects to the users.

5. PRODUCT COMMERCIALIZATION

The Ayur Flex Aroma Head Massager was then tested and verified its functionality by Dr. Ainain binti Hanafi a senior Lecturer in faculty of Mechatronic Engineering from Universiti Teknikal Malaysia Melaka (UTeM), Dr. Kaniappan a President Seni Pertahanan Diri Varmam and Master Poobalan Tana Singham a Varma Practitioner. The Ayur Flex Aroma Head Massager was then promoted into an actual product. Where a dedicated website built so that consumers can purchase the product for their daily use The website is <https://naturalhealers.wixsite.com/ayurflex-aroma-head>. Besides that, the Ayur Flex Aroma Head Massager was promoted on various platform of social media such as Facebook, Instagram, and Tiktok. The social media handle by Sangkaranaarayana Rau. The product retails at RM80 per unit. As for the herbs are sold separately in the event, they lose aroma over time. A large sachet was sold at RM10 while a smaller sachet was sold at RM5. At this affordable price range, many of the respondent purchased the Ayur Flex Aroma Head Massager which is about 503 units were sold.



Figure 31. Product Commercialization Logo



Figure 32. Ayur Flex Aroma Head Massager Website

6. CONCLUSION

As a conclusion, many suffer from stress and headaches due to the demands of a high paced lifestyle. In order to overcome this, many opt for quick relieves by using over the counter medications as such painkillers. However, in the long term, the usage of these painkillers will only be detrimental to its user. Therefore, one should always go for the natural supplements in order to relieve stress and headaches. The Ayur Flex Aroma Head Massager was developed with the goal of providing the best solution to headaches without any negative side effects. As many of the respondents gave positive remarks about the product. It can be concluded that Ayur Flex Aroma Head Massager was a success and relieves stress as well as headaches by integrating IoT systems and traditional herbs.

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