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1.0 Background of study

Functional food is defined as a food or a food product that in addition to its normal nutritional value has a special effect on the body that maintains or promotes the health or decrease the risk of disease. It is also known as 'health food', 'superfoods', 'nutraceuticals', 'pharma foods', 'nutritional foods', 'medical foods', and 'designer foods'.

In order to have a clear overview of 'Motivations of consumer in consumption of functional foods', a survey was conducted among the generation X and Y. Moreover, the questionnaires were distributed to 20 respondents which consist of both males and females for each group. The target respondents are mainly from generation X who born in the year 1961 to year 1981 and generation Y who born in the year 1982 to year 2004.

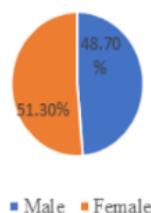
A total of 444 respondents have consented to the participation in this survey. However, upon transmission into data form, it was found that there are some errors in the data entry. Assuming the data starts from row 1, an additional column of the information has appeared at the end of the data from row 101 to 120. Since the second question in section C of the questionnaire has only asked 4 questions, the additional column does not represent any information, therefore it should not be taken into account when conducting the analysis. Nonetheless, upon deleting 20 rows of data, there is another error in the data entry. In row 196, it is found that education level of this row is marked with a '5' when there are only 4 levels of education available, therefore the row should be excluded as well. With that being said, 423 is the appropriate number of data to be used.

The objective of this assignment is to touch on the descriptive statistics which can assist us in describing the population data with implications of different types of graphs and charts. The statistics consist of demographic variables, such as gender, age group, education level, income proportion, and many more. For the part, kindly refer to section A of the assignment to further investigate. Furthermore, with the study of inferential statistics based on one and two samples test, it helps us to make the predictions or assumptions regarding the surveys taken from the entire population, by computing statistical variables that involved the usage of one or two samples. The 2 objectives have been picked out for the tests, namely finding out the low trustable level of benefits provided by functional food as perceived by generation Y, and whether the maintenance of the body shape and needs fulfilment for nutrients, vitamins and minerals are equally important to everyone. Kindly refer to section B of this assignment for further analysis.

2.0 Descriptive Statistics

2.1 Gender

Gender



Gender	Frequency	Percentage (%)
Male	206	48.70
Female	217	51.30

Figure 1

Figure 1 shows the detailed breakdown of the gender of total respondents. 423 respondents have been included in the research. From the result, the data was formed by the total of 206 male respondents (48.70%) and 217 female respondents (51.30%).

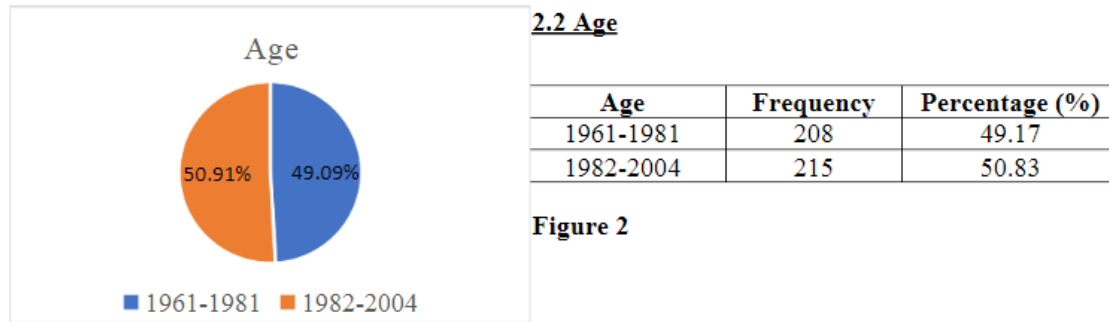
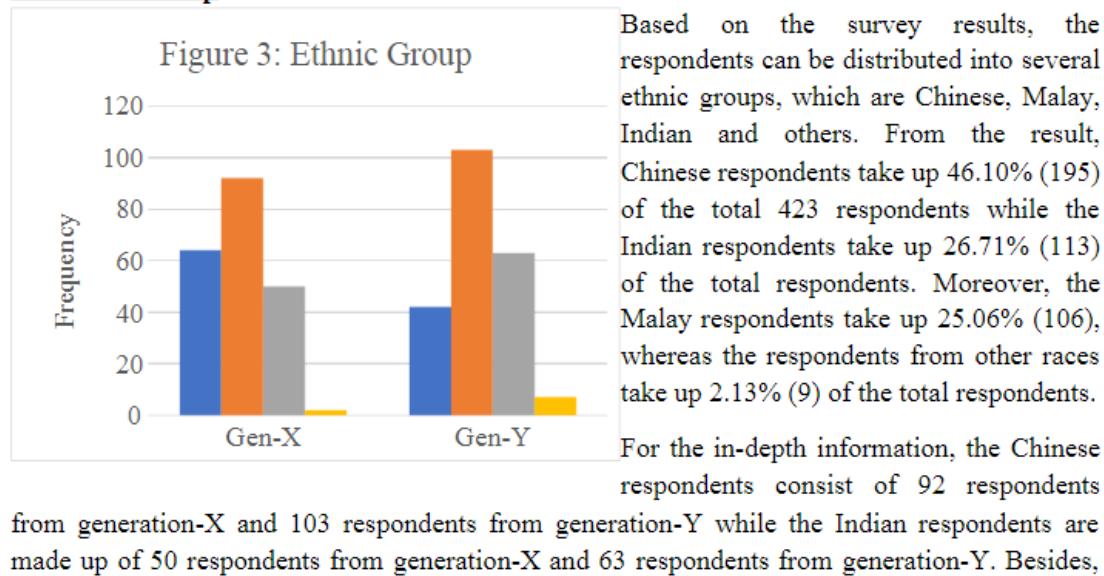


Figure 2

Additionally, there are two groups of respondents, who are from generation-X and generation-Y, have been targeted in the research. The respondents, who are from generation-X, were born between 1961 and 1981, whereas the respondents from generation-Y were born between 1982 and 2004. From the result, 208 respondents from generation-X (49.17%) and 215 respondents from generation-Y (50.83%) have formed the total of 423 respondents.

2.3 Ethnic Group



there are 64 respondents from generation-X and 42 respondents from generation-Y, which have formed the group of Malay. In addition, the group of other races consists of 2 respondents from generation-X and 7 respondents from generation-Y.

2.4 Educational Level

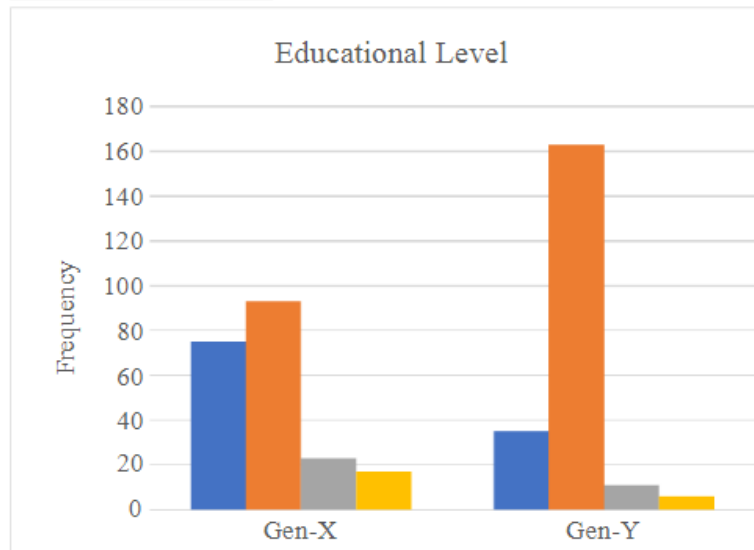
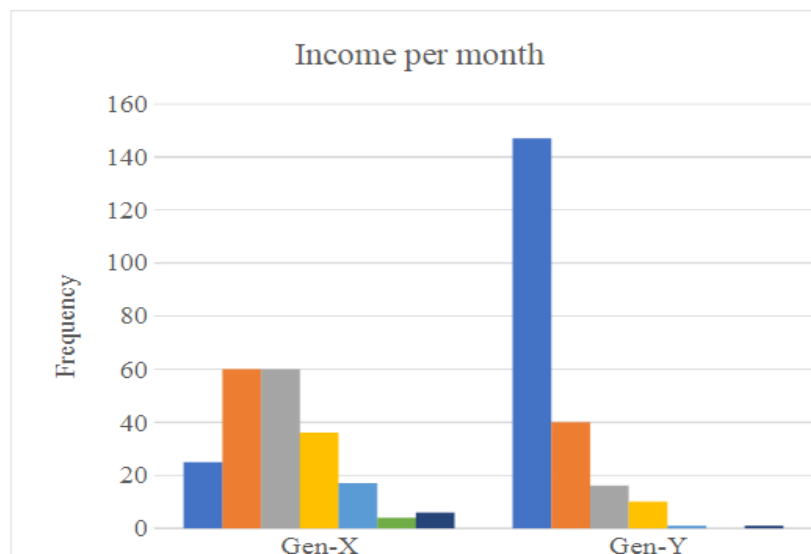


Figure 4

Based on the results, 60.52% (256) of the respondents falls under Diploma and undergraduate level. Besides that, the group consists of 93 respondents from generation-X and 163 respondents from generation-Y. Furthermore, 26% (110) of the respondents falls under secondary school or lower level. There are 75 respondents from generation-X and 35 respondents from generation-Y have formed the

educational group. Besides, there is only 8.04% (34) of respondents falling under Master or higher level. In addition, the group is formed by 23 respondents from generation-X and 11 respondents from generation-Y. Lastly, the remaining 5.43% (23) of the respondents are from other educational levels. It involves 17 respondents from generation-X and 6 respondents from generation-Y.



2.5 Income per month

Figure 5

From the results, the monthly income of 40.66% (172) respondents are below RM1500. Besides that, 25 respondents from generation-X and 147 respondents from

generation-Y. Moreover, the monthly income of 23.64% (100) respondents falls between RM1500 and RM3000. There are 60 and 40 respondents come from generation-X and generation-Y respectively. Next, 17.97% (76) respondents' monthly income is ranging from RM3001 to RM5000. 60 of the respondents come from generation-X, whereas 16 respondents come from generation-Y. Additionally, there are 10.87% (46) respondents earning between RM5001 and RM8000 per month. The group consists of 36 respondents from generation-X and 10 respondents from generation-Y. Furthermore, 4.26% (18) respondents' monthly income falls between RM8001 and RM10000. Besides that, 17 of them come from generation-X and only 1 respondent comes from generation-Y. Additionally, 0.95% (4) respondents are earning between RM10001 and RM15000 monthly, and they are from generation-X. Last but not least, there are 1.65% (7) respondents earning RM15001 and above monthly. From the result, 6 of them come from generation-X and 1 of them comes from generation-Y.

3.0 Inferential Statistics

3.1 One Sample Test

The hypothesis test is being used to determine whether the Generation Y has a low trustable level of the benefits provided by functional foods. (Section C Q1) The assumptions samples are randomly and independently drawn in different races which included Chinese, Malay, Indian, and others. Besides, it is assumed that the populations are normally distributed and population variances are unknown and equal. The sample size of 423 respondents have been recorded through the survey and selected for the testing. Assuming the confidence level for the hypothesis

test is 95%. The sample mean is $\frac{\sum x}{n} = \frac{1556}{423} = 3.69$ while the sample standard deviation is 0.91.

Solution:

Null Hypothesis (H_0): $Y \geq 4$ (Generation Y does not trust the benefits provided.)

Alternative Hypothesis (H_1): $Y < 4$ (Generation Y trusts the benefits provided.)

Critical value:

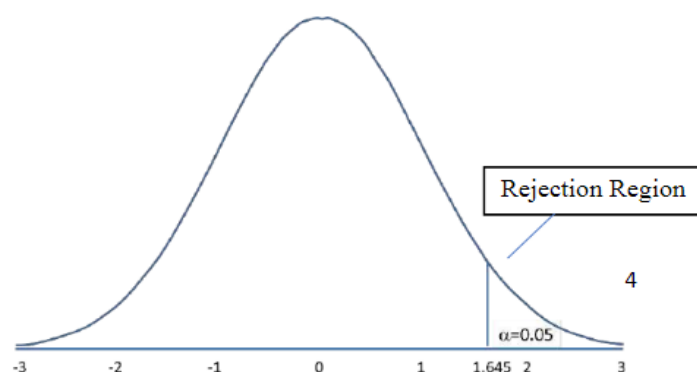
As the sample size is larger than 30, the Z-test is being implemented.

$$Z_{\alpha} = Z_{0.05} = -1.64$$

Decision rule:

If $Z < -1.64$, reject H_0 .

Test statistic:



$$Z = \frac{(\bar{x} - \mu)}{\frac{\sigma}{\sqrt{n}}}$$

$$Z = \frac{(3.69 - 4)}{\frac{0.91}{\sqrt{423}}}$$

$$Z = -7.01$$

Result:

-7.01 < -1.64. Reject H_0 .

Conclusion:

There is enough evidence to show Generation Y has high trust level of the benefits provided by functional foods.

3.2 Two Samples Test

The hypothesis test is being used to determine whether the maintenance the body shape and needs fulfilment for nutrients, vitamins, and minerals are equally important. (From Section B C3 C4) One of the assumptions to proceed the test is the samples are randomly and independently drawn. Besides, the populations are normally distributed. Moreover, the population variances of the samples are unknown and assumed they are equal. The sample size of 423 respondents have been recorded through the survey and selected for the testing. Assuming the confidence level for the hypothesis test is 95%. The table below shows the data collected that used to conduct the test:

	Balanced Diet Maintenance (1)	Needs Fulfilment (2)
Sum of Data $\sum x$	1459	1543
Sample Mean \bar{x}	$\frac{\sum x}{n} = \frac{1459}{423} = 3.45$	$\frac{\sum x}{n} = \frac{1543}{423} = 3.65$
Sample Standard Deviation (s)	$\sqrt{\frac{\sum (x - \bar{x})^2}{n - 1}} = \sqrt{\frac{(2510.22)^2}{423 - 1}} = 1.07$	$\sqrt{\frac{\sum (x - \bar{x})^2}{n - 1}} = \sqrt{1.104}$
Sample Size (n)	423	423

Solution:

Null Hypothesis (H_0): $\mu_1 = \mu_2$ (Maintaining the body shape and fulfilling needs for nutrients, vitamins, and minerals are equally important)

Alternative Hypothesis (H_1): $\mu_1 \neq \mu_2$ (Maintaining the body shape and fulfilling needs for nutrients, vitamins, and minerals are not equally important)

Rejection Region

Critical value:

$$\alpha = 0.05, \alpha/2 = 0.025$$

$$Z_{\alpha} = Z_{0.025} = \pm 1.96$$

Decision rule:

If $Z < -1.96$ or $Z > 1.96$, reject H_0 .

Test statistic:

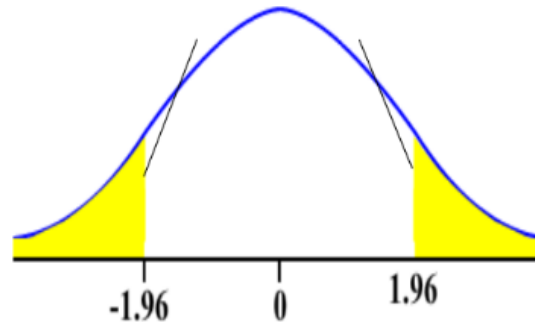
$$Z = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

$$Z = \frac{(3.45 - 3.65) - (0 - 0)}{\sqrt{\frac{1.07^2}{423} + \frac{1.04^2}{423}}}$$

$$Z = -2.76$$

Result:

As $-2.76 < -1.96$. Reject H_0 .

**Conclusion:**

There is enough evidence to show the maintenance the body shape and needs fulfilment for nutrients, vitamins, and minerals are equally important.

4.0 Conclusion

In conclusion, based on the demographic variables, it is submitted that there are slightly more female respondents when compared to male respondents that participated in this survey. We have tried our best to balance out between the gender ratio so that it does not seem bias. With that being said, we have used the generational breakdown method to differentiate between the age gap of our respondents. As such, generation x and y were used. For the purpose of further categorization, ethnic groups were used to distinguish between individuals who had taken part in our survey. Malay, Chinese, Indian and Others are mainly the 4 options made available due to them being the racial majority in the country of Malaysia. Educational level and income proportions were used as a form of measurement to increase the accuracy of the data measured.

Consequently, through the use of Z test for the one sample test, a high trust level between Generation Y towards the benefits provided by functional foods was determined. This may be due to the fact that generation Y is well-informed with the knowledge regarding the ins and outs of functional foods thanks to the advancement of technology. Various sources of information regarding functional foods are readily available, namely internet websites, blogs, social media, printed media such as newspaper, magazines, books and many more. When it comes to the two sample tests, we have proven that there is sufficient evidence to conclude that the maintaining of body shape and nutrients, vitamins, and minerals for needs fulfilment are equally important. The reason may be that people are highly preferred to be seen as physically presentable in terms of outlook, but at the same time opted to stay healthy, and staying away within the reach of doctors and medications.

In this survey, convenience sampling method has been applied in choosing our respondents. Convenience sampling is a non-probability sampling technique where subjects are selected because of their convenient accessibility and proximity to the researcher. After accounted the errors in data entry, 423 respondents were chosen to answer our questionnaires regarding the "Motivations of consumer in consumption of functional foods". To obtain a more accurate result, our respondents are involved in various demographic variables such as gender, age group, race, educational level, monthly expenses on food and many more. Most of the respondents friendly accepted the request to answer the questionnaire carefully. Data collection and analysis with descriptive and inferential statistics method have been learned through the assignment. Besides, the communication and teamwork are parts of the important elements when carrying out this assignment.