

**ASSESSMENT OF KNOWLEDGE, ATTITUDE, AND PRACTICES ON
FOOD POISONING AMONG SECONDARY SCHOOL STUDENTS IN
JOHOR**

**HANG YONG YI
(D18A0036)**

**A RESEARCH PAPER SUBMITTED TO THE FACULTY OF VETERINARY
MEDICINE, UNIVERSITI MALAYSIA KELANTAN
IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR
THE DEGREE OF
DOCTOR OF VETERINARY MEDICINE**

**DECEMBER 2022
UNIVERSITI MALAYSIA KELANTAN**

UNIVERSITI
MALAYSIA
KELANTAN

CERTIFICATION

This is to certify that we have read this research paper entitled '**Assessment of Knowledge, Attitude, and Practices on Food Poisoning Among Secondary School Students in Johor**' by Hang Yong Yi, and in our opinion it is satisfactory in terms of scope, quality and presentation as partial fulfillment of the requirement for the DVT 44603 - Research Project.

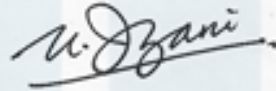


DR. ABD RAHMAN BIN AZIZ
Felo Kanan
Fakulti Perubatan Veterinar
Universiti Malaysia Kelantan

Dr. Abdul Rahman Bin Aziz
DVM (UAF), MVSc (UNIMELB)
Senior Fellow
Faculty of Veterinary Medicine
Universiti Malaysia Kelantan
(Supervisor)



Dr. Mohammed Dauda Goni
DVM (UNIIMAID), MSc (UPM), Ph.D (USM)
Fellow
Faculty of Veterinary Medicine
Universiti Malaysia Kelantan
(Co-supervisor)



Dr. Noor Izani Bin Noor Jamil

Bsc. (Biology), Msc. (Biology), Ph.D (Biology)

Lecturer/Senior Lecturer

School of Health Sciences

Universiti Sains Malaysia

(Co-supervisor)

UNIVERSITI
MALAYSIA
KELANTAN

ACKNOWLEDGEMENT

Special thanks for those who have given their support, guidance, advice, and aid for the completion of this project paper:

Dr Abdul Rahman Bin Aziz

Dr Mohammed Dauda Goni

Dr Noor Izani Bin Noor Jamil

Grandparents

Family

Spot

Tofu

Apocalypse Survivors

DVM 5 Class of 2017/2023

Thank You

UNIVERSITI

MALAYSIA

KELANTAN

DEDICATIONS

I'd like to dedicate this course of work to my family and friends of mine. Unconditional gratitude to my loving parents, who has been supporting me both financially and psychologically throughout the ups and downs in my undergraduate studies. Thank you to my sisters for always being by my side and providing the maximal support.

I also dedicate this dissertation to many of my lecturers, seniors, juniors and classmates who have been supporting me throughout the years of being here, offline and online. I would like to especially thank Dr Abdul Rahman Bin Aziz for always giving me advises and guidance to being a better student.

I dedicate this work and would like to specially thank my 'Apocalypse Survivors' friends, Izad, Judith, Sin Jia and Rui Ying for being there throughout the entire program of Doctor Veterinary Medicine. I know I wouldn't have made it this far without them.

Thank you, everyone.



TABLE OF CONTENTS

1.0 INTRODUCTION.....	13
1.1 Research problem	14
1.2 Research questions	15
1.2.1 What is the level of knowledge of secondary school students in Johor towards food poisoning?.....	15
1.2.2 What is the common attitude of secondary school students in Johor towards food poisoning?.....	15
1.2.3 What are the practices conducted among secondary school students in Johor towards preventing food poisoning?.....	15
1.3 Research hypothesis	15
1.3.1 Secondary school students in Johor have an appreciable level of knowledge towards food poisoning.	15
1.3.2 Secondary school students in Johor have an acceptable attitude towards food poisoning.	15
1.3.3 Secondary school students in Johor have good practices towards food poisoning.....	15
1.4 Objectives	16
1.4.1 To determine the level of knowledge towards food poisoning among secondary school students in Johor.....	16
1.4.2 To determine the attitude of secondary school students in Johor towards food poisoning.....	16
1.4.3 To determine the common practices among secondary school students in Johor towards food poisoning.....	16
2.0 LITERATURE REVIEW.....	17
2.1 Definition of Food Poisoning	17
2.2 Prevalence of Food Poisoning	17
2.3 Eating Behaviour and Technology	17

2.4 Food Poisoning in Schools	18
3.0 MATERIALS AND METHODS	19
3.1 Sample collection	19
3.2 Sample preparation	19
3.2.1 Study Area.....	19
3.2.2 Study Design	19
3.2.3 Source Population	19
3.2.4 Study Population	19
3.2.5 Selection Criteria.....	19
3.2.6 Data Collection Tools	20
3.2.7 Ethical Considerations	20
3.2.8 Data Collection.....	20
3.2.9 Data Analysis	20
4.0 RESULTS	21
4.1 Part I - Demographic Details	21
4.1.1 Gender	21
4.1.2 Race.....	21
4.1.3 Age	22
4.1.4 Districts	22
4.1.5 Area of Residence	23
4.1.6 Father's Highest Qualification	23
4.1.7 Mother's Highest Qualification.....	24
4.1.8 Number of Family Members	24
4.1.9 Who usually prepares the food?.....	25
4.2 Part II – Knowledge	25
4.2.1 Food poisoning is an illness caused by eating foods contaminated with microorganisms, their toxins or chemicals.	25

4.2.2	Can food poisoning lead to death?.....	25
4.2.3	Food poisoning is caused by?	26
4.2.4	What kind of food is food poisoning commonly implicated with?.....	27
4.2.5	Symptoms of food poisoning may include.....	28
4.2.6	Consuming leftover foods at room temperature can cause food poisoning.....	29
4.2.7	Consuming heated leftover foods at 74°C can avoid food poisoning.	29
4.2.8	Consuming spoiled foods cannot cause food poisoning.	30
4.2.9	Spoiled food can be seen with changes in.....	30
4.3	Part III – Attitude	31
4.4	Part IV – Practice	33
5.0	DISCUSSION	37
6.0	CONCLUSION AND RECOMMENDATION	40
	REFERENCES	41
	Appendix A	44

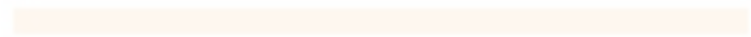
LIST OF TABLES

Table 1: Gender.....	21
Table 2: Race.....	21
Table 3: Age.....	22
Table 4: Districts.....	22
Table 5 Area of residence.....	23
Table 6: Father's highest education.....	23
Table 7: Mother's Highest Qualification.....	24
Table 8: Number of family members.....	24
Table 9: Food preparation.....	25
Table 10: Responses towards statement of 'Food poisoning is an illness caused by eating foods contaminated by microorganisms, their toxins or chemicals.'.....	25
Table 11: Responses towards question of 'Can food poisoning lead to death?'.....	26
Table 12: Respondents towards the question of 'Food poisoning is caused by?'.....	26
Table 13: Responses towards statement of 'Food poisoning is commonly implicated with consuming...'	27
Table 14: Responses towards statement of 'Symptoms of food poisoning may include...'	28
Table 15: Responses towards statement of 'Consuming leftover foods at room temperature can cause food poisoning.'.....	29
Table 16: Responses towards statement of 'Consuming heated leftover foods at 74°C can avoid food poisoning.....	29
Table 17: Responses towards statement of 'Consuming spoiled foods cannot cause food poisoning.'.....	30
Table 18: Responses towards statement of 'Spoiled food can be seen with changes in...'	30
Table 19: Responses towards questions regarding attitude of the secondary school students in Johor towards food poisoning.....	31
Table 20: Responses towards questions regarding practices of the secondary school students in Johor towards food poisoning.....	33

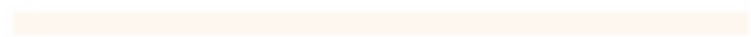
LIST OF FIGURES



UNIVERSITI



MALAYSIA



KELANTAN

FYP FPV

List of Appendices



UNIVERSITI

MALAYSIA

KELANTAN

FYP FPV

ABSTRACT

An abstract of the research paper presented to the Faculty of Veterinary Medicine, Universiti Malaysia Kelantan, in partial requirement on the course DVT 44603 – Research Project.

Food poisoning is an illness that is caused by consuming food that has been contaminated by microorganisms, their toxins or chemicals. Knowledge, awareness, and practice (KAP) regarding food poisoning are important to the secondary school students. There is still lack of study done regarding the KAP on food poisoning among the secondary school students in Johor. This study was carried out to assess the level of knowledge, attitude and practice of food poisoning among the secondary school students in Johor. A cross sectional survey among 175 secondary school students in Johor was conducted to assess the level of KAP toward food poisoning using a standardized modified and validated questionnaire. Data was analysed by means of percentage. Level of KAP regarding food poisoning among the students could be increased by delivering the information on social media. In conclusion, majority of the students had satisfactory level of KAP toward food poisoning.

Keywords: knowledge, attitude, practices, secondary school students, food, poisoning

UNIVERSITI
MALAYSIA
KELANTAN

ABSTRAK

Abstrak daripada kertas penyelidikan dikemukakan kepada Fakulti Perubatan Veterinar, Universiti Malaysia Kelantan untuk memenuhi sebahagian daripada keperluan kursus DVT 44603 – Research Project.

Keracunan makanan ialah satu penyakit yang akan berlaku jika makanan yang diambil dikontaminasi dengan mikroorganisma, toxinnya atau bahan kimia. Pengetahuan, sikap dan amalan praktikal terhadap keracunan makanan penting kepada pelajar sekolah menengah. Kajian yang dibuat untuk evaluasi pelajar sekolah menengah Johor tentang pengetahuan, sikap dan amalan praktikal terhadap keracunan makanan masih tidak mencukupi. Kajian tersebut telah dibuat untuk mengakses tahap pengetahuan, sikap dan amalan praktikal pelajar sekolah menengah Johor terhadap keracunan makanan. Kajian cross-sectional secara survey telah dibuat antara 175 pelajar sekolah menengah di Johor untuk mengakses tahap pengetahuan, sikap dan amalan praktikal terhadap keracunan makanan dengan menggunakan soal selidik yang standard dan sudah divalidasi. Data dari soal selidik telah dianalisis dalam peratusan. Secara konklusinya, tahap pengetahuan, sikap dan amalan praktikal terhadap keracunan makanan dalam kalangan pelajar sekolah menengah Johor boleh ditingkatkan melalui informasi yang disampaikan dalam media sosial.

Kata kunci: pengetahuan, sikap, amalan praktikal, pelajar sekolah menengah, keracunan, makanan

1.0 INTRODUCTION

Food is a chemical source of energy required by every living organism. However, it is possible for food to be contaminated with major sources from water, air, dust, equipment, sewage, insects, rodents, and employees (Siow, 2009). Meanwhile, these contaminants could be transmitted from different stages of food preparation (European Food Safety Authority, 2014). When food is exposed to foodborne microorganisms, humans who consume the food could result in illness, where food poisoning takes place (Al-Mazrou YY, 2004).

According to Hornby (2007), food poisoning is more commonly defined as “illnesses caused by bacteria or other toxins in food, typically with vomiting and diarrhoea.”

According to Selner (2021), typical symptoms included in common cases of food poisoning reported are abdominal cramps, diarrhoea, nausea, vomiting, inappetence, mild fever, weakness, and headache. whereas potentially life-threatening food poisoning included are diarrhoea that lasts for more than 3 days, a fever higher than 38.9°C, and difficulty seeing or speaking. According to the Ministry of Health of Malaysia (2019), the incidence rate of food poisoning was 45.71% per 100,000 population and mortality rate of food poisoning was 0.02% in 2018. In 2019, the incidence rate of food poisoning was 50.90% per 100,000 population and mortality rate of food poisoning was 0.03% per 100,000 population (Ministry of Health of Malaysia, 2020). The statistics has shown that there was an increment of 5.29% in the incidence rate of food poisoning and an increment of 0.01% in the mortality rate of food poisoning per 100,000 population, from the year 2018 to the year 2019. Common causes of food poisoning have undoubtedly been linked to the stage of preparation of the food as most cases were reported in the restaurants, stall markets, and school canteens. It has been reported that a school dining hall in Jelebu was ordered to be closed as 207 students in the school were having food poisoning symptoms, such as diarrhoea and nausea which was traced back to the dining hall for being the potential source of the foodborne illness (Bernama, 2020). According to Mohamed Sari, reported on the 15th of March 2017, a total of 88 students and 3 teachers have been diagnosed of food poisoning after consuming food at the school canteen a night before

(Komuniti Segamat, 2017). In the report, it is mentioned that 42 students have been experiencing symptoms of food poisoning since hours after the meal and on the next day, 46 students and 3 teachers have reported to be also experiencing similar symptoms.

Common pathogens of food poisoning on the other hand, includes *Staphylococcus aureus*, *Escherichia coli*, *Salmonella spp.*, *Listeria spp.*, *Campylobacter spp.*, and *Clostridium perfringens* (Sharifa Ezat W.P, 2013).

1.1 Research problem

Food poisoning is a common foodborne illness in Malaysia. However, despite the fact of food poisoning being one of the most common illnesses reported in Malaysia, there is still lack of acknowledgement in the aspect of the assessment of knowledge, attitude, and practices of secondary school students in Johor towards food poisoning.

1.2 Research questions

1.2.1 What is the level of knowledge of secondary school students in Johor towards food poisoning?

1.2.2 What is the common attitude of secondary school students in Johor towards food poisoning?

1.2.3 What are the practices conducted among secondary school students in Johor towards preventing food poisoning?

1.3 Research hypothesis

1.3.1 Secondary school students in Johor have an appreciable level of knowledge towards food poisoning.

1.3.2 Secondary school students in Johor have an acceptable attitude towards food poisoning.

1.3.3 Secondary school students in Johor have good practices towards food poisoning.

1.4 Objectives

1.4.1 To determine the level of knowledge towards food poisoning among secondary school students in Johor.

1.4.2 To determine the attitude of secondary school students in Johor towards food poisoning.

1.4.3 To determine the common practices among secondary school students in Johor towards food poisoning.



2.0 LITERATURE REVIEW

2.1 Definition of Food Poisoning

Food poisoning is defined as “an acute illness caused by food that may be naturally poisonous or contaminated by certain types of pathogenic microorganisms.” by Daintith. J (2005).

2.2 Prevalence of Food Poisoning

According to New, C.Y. et al. (2017), food poisoning cases occurring in schools from 2010 to 2015 have been increasing constantly every year. From 2010 to 2015, there has been a total increment of 1178 cases, which was from 3822 cases in 2010, to 8000 cases in 2015. This has indicated that food poisoning cases in schools have only been increasing every year in Malaysia.

2.3 Eating Behaviour and Technology

According to Salleh et al. (2017), urbanization has now made drastic inflation of population of areas that have been urbanized. Urbanization has as well, changed lifestyles of these people where they now spend more time eating out and having takeaways food because of the busy lifestyles they own. Eating outside is now a habit to many of the Malaysians. Restaurant premises are usually full with customers during peak hours and night hours where it increases the exposure of these customers to cross contaminate each other while going in and out of the premise, if the premise's cleanliness was not taken good care of. Other than that, many restaurant premises as well, use roadsides as their region of premise despite the food cleanliness issue. Even though that eating at an open area could offer more cosiness to customers, the customers may not be aware that they are at the same time, being exposed to more pollutants such as dust and even combustion from vehicles along the road. Students who are not informative of the issue may not realise these and still consume food from such stalls.

2.4 Food Poisoning in Schools

According to Dora-Liyana et al. (2018), food poisonings have been occurring mostly in schools. From their findings, they found out that having shorter time available for mass preparation of meals daily in a conventional kitchen could have been a huge factor as of why food poisonings occur mostly in schools. The handlers tend to have prepared the food early in the morning or even a day before the day of selling. This has most likely increased the probability of bacterial growth on the food. In their study, they have also found out that there is lacking of basic food handling practices among the food handlers.



3.0 MATERIALS AND METHODS

3.1 Sample collection

In this research project, self-administered, structured and validated questionnaires were handed out online through Google Form to secondary school students of Johor in whereby the students are allowed to answer the questionnaire from November until mid-December.

3.2 Sample preparation

3.2.1 Study Area

This study was conducted in all districts of Johor. The districts of Johor includes Batu Pahat, Johor Bahru, Kluang, Kota Tinggi, Kulai, Mersing, Muar, Pontian, Tangkak, and Segamat.

3.2.2 Study Design

A cross-sectional study design was conducted in this study, using purposive among secondary school students in Johor.

3.2.3 Source Population

Primary sources of data were taken into account in this study.

3.2.4 Study Population

The target population of this study were made up of secondary school students in all districts of Johor, which includes Batu Pahat, Johor Bahru, Kluang, Kota Tinggi, Kulai, Mersing, Muar, Pontian, Tangkak, and Segamat.

3.2.5 Selection Criteria

3.2.5.1 Inclusion Criteria

Secondary school ranging from the age of 13-years-old to 18-years-old students who were willing to participate in this study and were still studying in secondary school in Johor in the year of 2022.

3.2.5.2 Exclusion Criteria

Secondary school students out of the range of the age of 13-years-old to 18-years-old who were having special needs and were not willing to participate in the study and were no longer studying in secondary school in Johor in the year of 2022.

3.2.6 Data Collection Tools

A questionnaire was constructed modified from questions made from previous studies, majorly from the paper of “Knowledge, Attitude, and Practice toward Food Poisoning among Food Handlers and Dietetic Students in a Public University in Malaysia” by Mohd Yusof AM et al, 2018.

3.2.7 Ethical Considerations

Online consent was obtained from participating secondary school students. Johor State Education Department was also acknowledged about the carrying of this study.

3.2.8 Data Collection

The modified questionnaire was distributed online from November 2022 to mid-December 2022. Demographic details were obtained from the participants, before proceeding into Part II, Part III and Part IV that consists of questions regarding knowledge, attitude, and practices towards food poisoning.

3.2.9 Data Analysis

For this study, the data was administered into Microsoft Excel for analysis. The analysis conducted involves only the percentage of each responses to their corresponding questions.

4.0 RESULTS

Questionnaires were distributed to the secondary school students of Johor through Google Form where a total of 175 students have responded to the questionnaire. The respondents ranges within the age of 13 years old to 18 years old. All the data collected was then analysed using the SPSS software. The questionnaire was made into 4 parts, as below:

Part I – Demographic Details

Part II – Knowledge

Part III – Attitude

Part IV – Practices

The results obtained are categorised into good, moderate and poor based on the range below:

Good : >50%
 Moderate : 26% - 50%
 Poor : 0% - 25%

4.1 Part I - Demographic Details

4.1.1 Gender

Table 1: Gender

Gender	Frequency	Percentage (%)
Male	50	28.6
Female	125	71.4

The respondents of the study consists of 28.6% male and 71.4% female. (Refer table 1)

4.1.2 Race

Table 2: Race

Race	Frequency	Percentage (%)
------	-----------	----------------

Indian	7	4%
Malay	37	21.1%
Chinese	127	72.6%
Others	4	2.3%

The respondents of the study consists of 4% Indian, 21.1% Malay, 72.6% Chinese, and 2.3% of other races. (Refer table 2)

4.1.3 Age

Table 3: Age

Age	Frequency	Percentage (%)
13-years-old	6	3.4
14-years-old	7	4
15-years-old	52	29.7
16-years-old	40	22.9
17-years-old	19	10.9
18-years-old	51	29.1

The respondents of the study consists of 3.4% 13-years-old, 4% 14-years-old, 29.7% 15-years-old, 22.9% 16-years-old, 10.9% 17-years-old, and 29.1% 18-years-old. (Refer table 3)

4.1.4 Districts

Table 4: Districts

Districts	Frequency	Percentage (%)
Batu Pahat	7	4
Johor Bahru	36	20.6
Kluang	1	0.6
Kota Tinggi	3	1.7

Kulai	4	2.3
Mersing	1	0.6
Muar	10	5.7
Pontian	0	0
Tangkak	4	2.3
Segamat	109	62.3

The respondents of the study comes from various districts of Johor. 4% are from Batu Pahat, 20.6% are from Johor Bahru, 0.6% are from Kluang, 1.7% are from Kota Tinggi, 2.3% are from Kulai, 0.6% are from Mersing, 5.7% are from Muar, 0% is from Pontian, 2.3% are from Tangkak and 62.3% are from Segamat. (Refer table 4)

4.1.5 Area of Residence

Table 5 Area of residence

Area of residence	Frequency	Percentage (%)
Urban	110	62.9
Rural	65	37.1

In the study, 62.9% of the respondents are from urban area of residence while 37.1% of the respondents are from rural area of residence. (Refer table 5)

4.1.6 Father's Highest Qualification

Table 6: Father's highest education

Father's highest education	Frequency	Percentage (%)
Primary	13	7.4
Secondary	87	49.7
College	25	14.3

University	50	28.6
------------	----	------

In the study, 7.4% of the respondents' fathers' highest qualification is primary, 49.7% secondary, 14.3% college and 28.6% university. (Refer table 6)

4.1.7 Mother's Highest Qualification

Table 7: Mother's Highest Qualification

Mother's highest education	Frequency	Percentage (%)
Primary	12	6.9
Secondary	77	44
College	40	22.9
University	46	26.3

In the study, 6.9% of the respondents' fathers' highest qualification is primary, 44% secondary, 22.9% college and 26.3% university. (Refer table 7)

4.1.8 Number of Family Members

Table 8: Number of family members

Number of family members	Frequency	Percentage (%)
3	17	9.7
4	42	24
5	58	33.1
6	37	21.1
7	13	7.4
8	1	0.6
9	2	1.1
10	5	2.9

In the study, respondents come from family of various number of family members. There are 9.7% respondents with 3 family members, 24% with 4 family members,

33.1% with 5 family members, 21.1% with 6 family members, 7.4% with 7 family members, 0.6% with 8 family members, 1.1% with 9 family members and 2.9% with 10 family members. (Refer table 8)

4.1.9 Who usually prepares the food?

Table 9: Food preparation

Food preparation by	Frequency	Percentage (%)
Father	19	10.9
Mother	163	93.1
Buy ready-to-eat food	45	25.7

In the study, 10.9% of the respondents consume food that is usually prepared by their fathers while 93.1% of the respondents consume food that is usually prepared by their mothers. There is 25.7% of the respondents who usually consume ready-to-eat food. (Refer table 9)

4.2 Part II – Knowledge

4.2.1 Food poisoning is an illness caused by eating foods contaminated with microorganisms, their toxins or chemicals.

Table 10: Responses towards statement of ‘Food poisoning is an illness caused by eating foods contaminated by microorganisms, their toxins or chemicals.’

	Frequency	Percentage (%)	Score
Yes	169	96.6	Good
No	6	3.4	

A total of 96.6% of the respondents agree that food poisoning is an illness caused by eating foods contaminated by microorganisms, their toxins or chemicals and 3.4% of the respondents disagree with the statement. (Refer table 10)

4.2.2 Can food poisoning lead to death?

Table 11: Responses towards question of ‘Can food poisoning lead to death?’.

	Frequency	Percentage (%)	Score
Yes	161	92	Good
No	14	8	

A total of 92% of the respondents agree that food poisoning can lead to death while 8% of the respondents think otherwise. (Refer table 11)

4.2.3 Food poisoning is caused by?

Table 12: Respondents towards the question of ‘Food poisoning is caused by?’

		Frequency	Percentage (%)	Score
Bacteria	Yes	168	96	Good
	No	7	4	
Viruses	Yes	121	69.1	Good
	No	54	30.9	
Fungi	Yes	147	84	Good
	No	28	16	
Parasites	Yes	133	76	Good
	No	42	24	
Chemical residues	Yes	149	85.1	Good
	No	26	14.9	

A total of 96% of the respondents think that bacteria causes food poisoning and 4% think that bacteria does not cause food poisoning. A total of 69.1% of the respondents think that viruses cause food poisoning and 30.9% think that viruses do not cause food poisoning. A total of 84% of the respondents think that fungi causes food poisoning and 16% think that fungi does not cause food poisoning. 76% of the respondents think that parasites cause food poisoning and 24% of the respondents think that parasites do not cause food poisoning. A total of 85.1% of the respondents think that chemical

residues cause food poisoning and 14.9% of the respondents think that chemical residues do not cause food poisoning. (Refer table 12)

4.2.4 What kind of food is food poisoning commonly implicated with?

Table 13: Responses towards statement of ‘Food poisoning is commonly implicated with consuming...’.

		Frequency	Percentage (%)	Score
Raw egg	Yes	147	84	Good
	No	28	16	
Fresh cooked rice	Yes	25	14.3	
	No	150	85.7	Good
Raw milk	Yes	142	81.1	Good
	No	33	18.9	
Sushi	Yes	114	65.1	Good
	No	61	34.9	
Fresh cooked instant noodles	Yes	30	17.1	
	No	145	82.9	Good
Raw chicken	Yes	164	92.7	Good
	No	11	6.3	
Raw meat	Yes	162	92.6	Good
	No	13	7.4	
Fresh bread	Yes	23	13.1	
	No	152	86.9	Good
Dry food	Yes	35	20	
	No	140	80	Good
Dairy product	Yes	72	41.1	
	No	103	58.9	Good
Seafood	Yes	132	75.4	Good
	No	43	24.8	
Vegetables	Yes	46	26.3	

	No	129	73.7	Good
Fruits	Yes	46	26.3	
	No	129	73.7	Good

4.2.5 Symptoms of food poisoning may include...

Table 14: Responses towards statement of ‘Symptoms of food poisoning may include...’.

		Frequency	Percentage (%)	Score
Vomiting	Yes	167	95.4	Good
	No	8	4.6	
Difficulty in breathing	Yes	92	52.6	
	No	83	47.4	Moderate
Diarrhoea	Yes	163	93.1	Good
	No	12	6.9	
Strangury (Painful, frequent urination of small volume)	Yes	103	58.9	
	No	72	41.1	Moderate
Abdominal cramp	Yes	142	81.1	Good
	No	33	18.9	
Bloody faeces	Yes	91	52	Good
	No	84	48	
Bleeding gums	Yes	51	29.1	
	No	124	70.9	Good

A total of 95.4% of the respondents think that vomiting is a symptom of food poisoning and 4.6% of the respondents think that vomiting is not a symptom of food poisoning. A total of 52.6% of the respondents think that difficulty in breathing is one of the food poisoning symptoms while 47.4% disagree. A total of 93.1% of the respondents think

that diarrhoea is a symptom of food poisoning while 7.9% of the respondents think otherwise. A total of 58.9% of the respondents think that strangury (painful, frequent urination of small volume) is a symptom of food poisoning while 41.1% of the respondents disagree. Total of 81.1% of the respondents agree that abdominal cramp is one of the symptoms of food poisoning while 18.9% disagree. Total of 52% of the respondents think that bloody faeces is a symptom of food poisoning while 48% think not. Total of 29.1% of the respondents included bleeding gums as one of the symptoms of food poisoning while 70.9% of the respondents excluded it. (Refer table 14)

4.2.6 Consuming leftover foods at room temperature can cause food poisoning.

Table 15: Responses towards statement of ‘Consuming leftover foods at room temperature can cause food poisoning.’.

	Frequency	Percentage (%)	Score
Yes	126	72	Good
No	49	28	

A total of 72% of the respondents agree that consuming leftover foods at room temperature can cause food poisoning while 28% of the respondents think that consuming leftover foods at room temperature cannot cause food poisoning. (Refer table 15)

4.2.7 Consuming heated leftover foods at 74°C can avoid food poisoning.

Table 16: Responses towards statement of ‘Consuming heated leftover foods at 74°C can avoid food poisoning.’.

	Frequency	Percentage (%)	Score
Yes	105	60	Good
No	70	40	

A total of 60% of the respondents from the study has agreed that consuming heated leftover foods at 74°C can avoid food poisoning while 40% think otherwise. (Refer table 16)

4.2.8 Consuming spoiled foods cannot cause food poisoning.

Table 17: Responses towards statement of ‘Consuming spoiled foods cannot cause food poisoning.’.

	Frequency	Percentage (%)	Score
Yes	52	29.7	
No	123	70.3	Good

A total of 70.3% of the respondents think that consuming spoiled foods can cause food poisoning while 29.7% of the respondents think that consuming spoiled foods cannot cause food poisoning. (Refer table 17)

4.2.9 Spoiled food can be seen with changes in...

Table 18: Responses towards statement of ‘Spoiled food can be seen with changes in...’.

		Frequency	Percentage (%)	Score
Food texture	Yes	167	95.4	Good
	No	8	4.6	
Odour	Yes	159	90.9	Good

	No	16	9.1	
Taste	Yes	168	96	Good
	No	7	4	
Colour	Yes	169	96.6	Good
	No	6	3.4	

Among the 175 respondents, 95.4% of them think that food texture is a change seen in spoiled food while 4.6% think not. A total of 90.9% of the respondents think that odour is associated with the changes seen in spoiled food while 9.1% do not think so. Total of 96% of the respondents think that taste is a change seen in spoiled food while 4% of the respondents think that taste is not a change seen in spoiled food. Total of 96.6% of the respondents think that colour is a change in spoiled food while 3.4% of the respondents think otherwise. (Refer table 18)

4.3 Part III – Attitude

Table 19: Responses towards questions regarding attitude of the secondary school students in Johor towards food poisoning.

		Frequency	Percentage (%)	Score
I'd rather drink raw milk than pasteurized milk.	Agree	48	27.4	
	Disagree	127	72.6	Good
Eating fresh raw unpasteurized milk is safe.	Agree	48	27.4	
	Disagree	127	72.6	Good
Keeping long fingernails can contaminate food.	Agree	120	68.6	Good

	Disagree	55	31.4	
Restaurants should wear head coverings when preparing food.	Agree	158	90.3	Good
	Disagree	17	9.7	
Half-cooked meat is safe to be eaten.	Agree	41	23.4	
	Disagree	134	76.6	Good
Drinking milk from a dented can is safe.	Agree	45	25.7	
	Disagree	130	74.3	Good
Eating in an unclean cafeteria is safe.	Agree	21	12	
	Disagree	154	88	Good
Every person can be a source of food poisoning.	Agree	140	80	Good
	Disagree	35	20	
Wiping off the cutting board with a clean paper towel is enough to prevent the spreading of foodborne pathogens.	Agree	69	39.4	
	Disagree	106	60.6	Good
If I have any signs of food poisoning, I will immediately think of seeing a doctor.	Agree	156	89.1	Good
	Disagree	19	10.9	

In this study answered by 175 respondents, 27.4% agree to drink raw milk than pasteurized milk while 72.6% disagree to drink raw milk than pasteurized milk. Total

of 27.4% of the respondents agree that eating fresh raw unpasteurized milk is safe while 72.6% of the respondents disagree with the statement. 68.6% of the respondents agree that keeping long fingernails can contaminate food while 31.4% of the respondents disagree that keeping long fingernails can contaminate food. Total of 90.3% of the respondents agree that restaurants should wear head coverings when preparing food while 9.7% of the respondents disagree. 23.4% of the respondents agree that half-cooked meat is safe to be eaten while 76.6% of the respondents disagree that half-cooked meat is safe to be eaten. Total of 25.7% of the 175 respondents think agree that drinking milk from a dented can is safe while 74.3% of the respondents disagree so. Total of 12% of the respondents agree that eating in an unclean cafeteria is safe while 88% of the respondents disagree that eating in an unclean cafeteria is safe. Total of 80% of the respondents agree with the statement where it says every person can be a source of food poisoning while 20% think otherwise. Total of 39.4% of the respondents agree that wiping off the cutting board with a clean paper towel is enough to prevent the spreading of foodborne pathogens while 60.6% disagree. Total of 89.1% of the respondents agree that if they had any signs of food poisoning, they will immediately think of seeing a doctor while 10.9% disagree with it. (Refer table 19)

4.4 Part IV – Practice

Table 20: Responses towards questions regarding practices of the secondary school students in Johor towards food poisoning.

		Frequency	Percentage (%)	Score
Checking the expiry date before buying foods.	Always	151	86.3	Good
	Seldom	22	12.6	
	Never	2	1.1	
Washing the cutting board before use.	Always	149	85.1	Good

	Seldom	24	13.7	
	Never	2	1.1	
Washing hands with water and soap before and after eating.	Always	132	75.4	Good
	Seldom	40	22.9	
	Never	3	1.7	
Keeping cooked meat or chicken for more than 4 hours at room temperature.	Always	53	30.3	
	Seldom	81	46.3	Moderate
	Never	41	23.4	
Allowing fingernails to grow long.	Always	27	15.4	
	Seldom	68	38.9	
	Never	80	45.7	Moderate
Washing fresh vegetables and fruits before eating.	Always	159	90.9	Good
	Seldom	13	7.4	
	Never	3	1.7	
Wear gloves during food preparation.	Always	55	31.4	
	Seldom	78	44.6	Moderate
	Never	42	24	
Not spitting around eateries.	Always	132	75.4	Good
	Seldom	30	17.1	
	Never	13	7.4	
Checking the hygiene grade of the premises	Always	93	53.1	Good

before entering the eatery.				
	Seldom	66	37.7	
	Never	16	9.1	
Smelling the food first to make sure it is not spoiled.	Always	141	80.6	Good
	Seldom	29	16.6	
	Never	5	2.9	

In this study where 175 responses were collected, 86.3% of the respondents always check the expiry date before buying foods. A total of 12.6% of the respondents seldom check the expiry date before buying foods and 1.1% of the respondents never check the expiry date before buying foods. Next, 85.1% of the respondents always wash the cutting board before using them. 13.7% of the respondents seldom wash the cutting board before use while 1.1% of the respondents never wash the cutting board before use. Meanwhile, 75.4% of the respondents always wash their hands with water and soap before and after eating. Total of 22.9% of the respondents seldom do so where 1.7% of the respondents never wash their hands with water and soap before and after eating. Total of 30.3% of the respondents always keep cooked meat or chicken for more than 4 hours at room temperature while 46.3% of the respondents seldom do so. Total of 23.4% has never kept cooked meat or chicken for more than 4 hours at room temperature. A total of 15.4% of the respondents always allow fingernails to grow long while 38.9% of the respondents seldom allow their fingernails to grow long. A total of 45.7% of the respondents never do so. A total of 90.9% of the respondents always wash their fresh vegetable and fruits before eating. A total of 7.4% of the respondents seldom wash their fresh vegetables and fruits before eating while 1.7% of the respondents never wash their fresh vegetables and fruits before eating. A total of 31.4% of the respondents always wear gloves when preparing their food. A total of 44.6% of the respondents seldom wear gloves during food preparation while 24% never wear gloves during food preparation. A total of 75.4% of the respondents always manage to not spit around eateries while 17.1% of the respondents seldom not spit around eateries. A total of 7.4% of the respondents has never, not spit around eateries.

A total number of 53.1% of the 175 respondents always check the hygiene grade of the premises before entering the eatery. Meanwhile, 37.7% of the respondents seldom check the hygiene grade of the premises before entering the eatery and 9.1% of the respondents never do so. Total of 80.6% of the respondents always smell the food first to make sure it is not spoiled while 16.6% of them seldom do so. 2.9% of the respondents has never smelt their food first to make sure it is not spoiled. (Refer table 20)

5.0 DISCUSSION

In this study where the knowledge, attitude, and practices of secondary school students in Johor towards food poisoning is taken, majority of the respondents consists of female, at the percentage of 71.4%. Among the 175 respondents, 72.6% of them are Chinese, 21.1% of them are Malay, 4% of them are indians where only 2.3% of the respondents are races other than Chinese, Malay and Indian. 29.7% of the respondents are 15-years-old where only 3.4% of the respondents are 13-years-old. 62.3% of these respondents also live in Segamat and 0 respondents from Pontian has answered the questionnaire. In the study, a majority of 62.9% of the respondents answered that they live in an urban area while 37.1% of the respondents answered that they live in a rural area. Most of the respondents' fathers have secondary school qualification as their highest qualification (49.7%), leaving a minority of 7.4% of the respondents having primary school qualification as their fathers' highest qualification. With parents of higher qualification, it may be possible where the parents themselves have experienced food poisoning during their secondary school years or may be more informed about the issue. Among the 175 respondents, 44%, which is 77 of the respondents answered that their mothers have secondary school qualification as their highest qualification while 6.9% of them answered primary school qualification as their mothers' highest qualification. Furthermore, 33.1% of the respondents have a total of 5 family members in their families while 0.6% of the respondents have 8 family members in their families. Among the 175 respondents, majorly, 93.1% of them consume food that is usually prepared by their mothers while 10.9% of them consume food that is usually prepared by their fathers.

For the part of the questionnaire that inquires knowledge, secondary school students of Johor have high level of knowledge towards food poisoning as majority of the respondents, which are more than 50% of the respondents, have answered each question regarding knowledge towards food poisoning correctly. 96.6% of the respondents are aware that food poisoning is an illness caused by eating foods contaminated by microorganisms, their toxins or chemical whereby 92% of them are aware that food poisoning can lead to death. The secondary school students in Johor are also aware of the causative agents of food poisoning, alongside with examples of food that could cause food poisoning as a majority that is more than 50% have answered the questions towards them correctly. Furthermore, the secondary school

students of Johor are also aware of the symptoms of food poisoning as majority of more than 50% have answered the corresponding question correctly. However, they seemed to have confusion knowing whether difficulty in breathing and bloody faeces are one of the food poisoning. According to Aljamali et al. (2021), the symptoms of food poisoning vary accordingly to its causative agents. However, difficulty in breathing could occur when there has been changes in consciousness, affecting heart rate and breathing as well. Even though it is again, mentioned that the food poisoning symptoms vary accordingly to its causative agents, bloody faeces was not included as one of them. Next, it is shown that the secondary school students in Johor are also aware that consuming leftover foods at room temperature can cause food poisoning as 72% of them know so. 60% of them are also aware that consuming heated leftover foods at 74 °C can prevent food poisoning. They are also aware that consuming spoiled foods can cause food poisoning as 70.3% of them have answered the corresponding question correctly. Lastly, the respondents of this questionnaire are also aware of the changes that can be seen in spoiled food as majority (more than 50%) of the respondents have answered the question correctly, when asked.

Moving onto the next part which questions on the attitude of the secondary students in Johor towards food poisoning, it is shown that majority of the respondents have good attitude towards food poisoning. Majority of the respondents have been having good attitude towards the questions regarding attitudes towards food poisoning as more than 50% of the respondents have shown so in the data retrieved. However, there are 2 statements with poorer attitude, as compared to the other statements as the other statements have been obtaining at least 70% of the respondents in having a good attitude for. In the questionnaire, only 68.6% of the respondents have answered good attitude when asked whether if keeping long fingernails can contaminate food. Moreover, only 60.6% of the respondents have disagreed when asked whether if wiping off the cutting board with a clean paper towel is enough to prevent the spreading of pathogens.

The overall responses of practices in secondary school students of Johor in food poisoning is also good as most of the questions have achieved more than 50% for good practices asked. Despite having good knowledge and good attitude towards food poisoning, many of the respondents still have poorer practices when being asked certain questions. For example, even though majority of the respondents know that consuming leftover food at room temperature can cause food poisoning, 30.3% of the

respondents always keep cooked meat or chicken for more than 4 hours at room temperature whereby only 23.4% of them have never done so, leaving 46.3% of the respondents who seldom do this. Moreover, as expected from the attitude part where only 68.6% of the respondents thinking that keeping long fingernails can contaminate food, only 45.7% of the respondents never allow their fingernails to grow long, leaving 38.9% of them seldom doing this and 15.4% of them always allowing their fingernails to grow long. Other than that, only 31.4% of the respondents always wear gloves during food preparation. 44.6% of the respondents seldom wear gloves during food preparation while 24% of them have never done this. Lastly, 53.1% of the respondents always check the hygiene grade of the premises before entering the eatery while 37.7% of them seldom do this. Leaving 9.1% of them never checking the hygiene grade of the premises before entering.

Based on the data retrieved, majority of the respondents have shown to be having a satisfactory level of knowledge, attitude, and practices towards food poisoning. For almost all the questions, more than 50% of the secondary school students in Johor have managed to prove themselves to have good knowledge, attitude, and practices towards food poisoning.

6.0 CONCLUSION AND RECOMMENDATION

In conclusion, the overall knowledge, attitude, and practices of secondary school students in Johor towards food poisoning is good. This is proven as more than 50% of the respondents have shown satisfactory level of knowledge, attitude, and practices through the questionnaire. Hence, the research hypothesis is accepted. Secondary school students in Johor do have an appreciable level of knowledge towards food poisoning. Secondary school students in Johor also have an acceptable attitude towards food poisoning. Lastly, secondary school students in Johor have conducted good practices towards food poisoning.

The current study can be improved if more samples have been able to be obtained from other districts of Johor. As seen in this study, majority of the respondents originate from Segamat only whereby it is obviously seen that there is a lacking of respondents in all the districts of Johor, other than Segamat. This may be because that most of the respondents in Segamat were more actively sharing the questionnaires among their friends and families. Other than that, the study can also be improved if the study was answered by an equal amount of male and female students, alongside with an equal amount of ages amongst the students.

REFERENCES

- Al-Mazrou Y. Y. (2004). Food poisoning in Saudi Arabia. Potential for prevention?. *Saudi medical journal*, 25(1), 11–14.
- Aljamali, N. M. (2021). Review on food poisoning (types, causes, symptoms, diagnosis, treatment). *Global Academic Journal of Pharmacy and Drug Research*, 3(4), 54-61.
- Bernamea. (2020, October 20). 207 Mrsm students down with food poisoning. *New Straits Time*. Retrieved June 7, 2022, from <https://www.nst.com.my/news/nation/2020/10/633907/207-mrsm-students-down-food-poisoning>.
- Daintith, J., & Martin, E. A. (2005). *A dictionary of science*. Oxford University Press.
- Dora-Liyana, A. L., Mahyudin, N. A., Ismail-Fitry, M. R., Ahmad-Zaki, A., Rasiyuddin, H. (2018). Food Safety and Hygiene Knowledge, Attitude and Practices among Food Handlers at Boarding Schools in the Northern Region of Malaysia. *International Journal of Academic Research in Business and Social Sciences*, 8(17), 238-266.
- EFSA (European Food Safety Authority), ECDC (European Centre for Disease Prevention and Control). The European Union summary report on trends and sources of zoonoses, zoonotic agents and food-borne outbreaks in 2014. *EFSA Journal*. 2015;13(12):4329 [191 pp.]. 10.2903/j.efsa.2015.4329
- Health Facts 2019. Moh.gov.my. (2019). Retrieved 7 June 2022, from https://www.moh.gov.my/moh/resources/Penerbitan/Penerbitan%20Utama/HEALTH%20FACTS/Health%20Facts%202019_Booklet.pdf.
- Health Facts 2020. Moh.gov.my. (2020). Retrieved 7 June 2022, from

<https://www.moh.gov.my/moh/resources/Penerbitan/Penerbitan%20Utama/HEALTH%20FACTS/Health%20Facts%202020.pdf>.

Hornby, A. S., & Lea, D. (2020). Oxford Advanced Learner's Dictionary of *current English*. Oxford University Press.

New, C. Y., Ubong, A., Premarathne, J. M. K. J. K., Thung, T. Y., Lee, E., Chang, W. S., Loo, Y. Y., Kwan, S. Y., Tan, C. W., Kuan, C. H., & Son, R. (2017). Microbiological food safety in Malaysia from the academician's perspective. *Food Research*, 1(6), 183-202. <https://doi.org/10.26656/fr.2017.6.013>

Mohd Yusof AM, Rahman NAA, Haque M. Knowledge, Attitude, and Practice toward Food Poisoning among Food Handlers and Dietetic Students in a Public University in Malaysia. *J Pharm Bioallied Sci*. 2018 Oct-Dec;10(4):232-239. doi: 10.4103/JPBS.JPBS_141_18. PMID: 30568381; PMCID: PMC6266644.

Saari, M. (2017, March 16). 88 Pelajar Dan Tiga guru Smka Segamat dipercayai *Keracunan Makanan*. Komuniti Segamat. Retrieved January 1, 2023, from <https://segamat.com.my/88-pelajar-dan-tiga-guru-smka-segamat-dipercayai-keracunan-makanan/>

Salleh, W., Lani, M.N., Abdullah, W.Z.W., Chilek, T.Z.T. & Hassan, Z. 2017. A review on incidences of foodborne diseases and interventions for a better national food safety system in Malaysia. *Malaysian Applied Biology* 46(3): 1-7. Sharifa Ezat, W. P., Netty, D. and Sangaran, G. 2013. Paper review of factors, surveillance and burden of food borne disease outbreak in Malaysia. *Malaysian Journal of Public Health Medicine* 13 (2):98-105

Selner, M. (2021, December 8). Food poisoning: Symptoms, causes, and *treatment - healthline*. What You Need to Know About Food Poisoning, Its Causes, and Treatments. Retrieved June 7, 2022, from <https://www.healthline.com/health/food-poisoning>

Siow, O. N., & Norrakiah Abdullah Sani. (2009, December 9). *Assessment of knowledge, attitudes and practices (KAP) among food ... - UKM*. Retrieved June 7, 2022, from https://www.ukm.my/jsm/pdf_files/SM-PDF-40-4-2011/19%20Siow.pdf

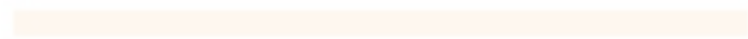
Wan Puteh, Sharifa Ezat & Netty, D. & Sangaran, G.. (2013). Paper review of factors, surveillance and burden of food borne disease outbreak in Malaysia. *Malaysian Journal of Public Health Medicine*. 13.



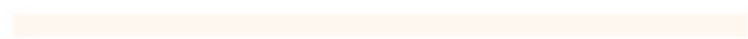
Appendix A



UNIVERSITI



MALAYSIA



KELANTAN

FYP FPV