UNIVERSITI PUTRA MALAYSIA

ASSESSMENT OF KNOWLEDGE, ATTITUDE, AND PRACTICE (KAP) TOWARDS WATER, SANITATION, AND HYGIENE (WASH) AMONG SECONDARY SCHOOL STUDENTS IN PETALING DISTRICT

WANI AZIZAH BINTI ABDUL HADI KAMAL

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BY

WANI AZIZAH BINTI ABDUL HADI KAMAL

Thesis submitted in fulfilment of the requirement for the degree of Bachelor Science (Environmental and Occupational Health) from the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia

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ABSTRACT

ASSESSMENT OF KNOWLEDGE, ATTITUDE, AND PRACTICE (KAP) TOWARDS WATER, SANITATION, AND HYGIENE (WASH)AMONG SECONDARY SCHOOL STUDENTS IN PETALING DISTRICT

WANI AZIZAH BINTI ABDUL HADI KAMAL

Introduction: The terms water, sanitation, and hygiene (WASH) were intertwined and focused on improving people's life quality. The deficiency of one component will cause an impact on the other component and make it difficult to achieve good public health. Insufficient knowledge, attitude, and WASH practice contribute to a high rate of infectious disease **Objective:** This cross-sectional study aimed to determine the knowledge, attitude, and practice of secondary school students in the Petaling district and evaluate the relationship between KAP levels with sociodemographic characteristics **Methodology:** Multistage cluster sampling was used in this current study. First, the selection of 4 schools was made from the cluster and simple random sample. Three hundred eighty-four Form 4 students were also randomly selected to participate in this KAP study. The online questionnaire was distributed and answered by students. Descriptive and chi-square test were used to present the findings of the study. **Results and Discussion:** The response rate was 97.7%**.** The majority of respondents are Malay (64.6%) students. Male and female were equally distributed with 43.5 % and 56.5%, respectively. The highest number of students was found in the high knowledge (59.9%), high attitude (89.6%), and high practice level (85.4%)**.** All are derived with 95% CI and 5% Margin of error. There is a significant difference (p<0.05) between knowledge, attitude, and practice level with gender, ethnicity, and parent's education level. However, there is no significant difference (p>0.05) between practice and parent's education level. **Conclusion:** Although their knowledge, attitude, and practice on WASH are high, there is a need to acknowledge them of specific components of WASH where they still lack information. Youth nowadays are more easily influenced by social media, and it can be proved from the statistic of students that respond to getting information on WASH. About 57.8% were obtained information about WASH on the Internet. Making a program in school is a little outdated and boring for today's youth. Therefore, health authorities, as well as public health NGOs, need to play a role by using social media platforms to increase students' knowledge of WASH.

Keywords: KAP, Water, Sanitation, Hygiene, Secondary school students

ABSTRAK

PENILAIAN TENTANG PENGETAHUAN, SIKAP DAN AMALAN (KAP) TERHADAP AIR, SANITASI DAN KEBERSIHAN (WASH) DI KALANGAN PELAJAR SEKOLAH MENENGAH DI DAERAH PETALING

WANI AZIZAH BINTI ABDUL HADI KAMAL

Pendahuluan: Istilah air, sanitasi, dan kebersihan (WASH) saling berkaitan dan difokuskan pada peningkatan kualiti hidup manusia. Kekurangan satu komponen akan memberi kesan kepada komponen yang lain dan menyukarkan untuk mencapai kesihatan awam yang baik. Pengetahuan, sikap, dan amalan WASH yang tidak mencukupi menyumbang kepada kadar penyakit berjangkit yang tinggi **Objektif:** Kajian rentas ini bertujuan untuk mengetahui pengetahuan, sikap, dan amalan pelajar sekolah menengah kebangsaan di daerah Petaling dan menilai hubungan antara tahap KAP dengan sosiodemografik **Metodologi:** Persampelan kelompok bertingkat digunakan dalam kajian ini. Pertama, pemilihan empat sekolah dibuat dari kelompok dan sampel rawak mudah. Tiga ratus lapan puluh empat pelajar Tingkatan 4 juga dipilih secara rawak untuk mengikuti kajian KAP ini. Soal selidik dalam talian diedarkan dan dijawab oleh pelajar. Ujian deskriptif dan chi-square digunakan untuk membentangkan hasil kajian. **Hasil dan Perbincangan:** Kadar tindak balas responden adalah sebanyak 97.7%. Majoriti responden adalah pelajar Melayu (64.6%). Lelaki dan wanita diagihkan sama rata dengan masing-masing 43.5% dan 56.5%. Jumlah pelajar tertinggi didapati pada tahap pengetahuan tinggi (59.9%), sikap tinggi (89.6%), dan tahap amalan tinggi (85.4%). Terdapat perbezaan yang signifikan ($p<0.05$) antara tahap pengetahuan, sikap, dan praktik dengan jantina, etnik, dan tahap pendidikan ibu bapa. Walau bagaimanapun, tidak ada perbezaan yang signifikan ($p>0.05$) antara amalan dan tahap pendidikan ibu bapa. **Kesimpulan:** Walaupun pengetahuan, sikap, dan praktik pelajar terhadap WASH cukup tinggi, ada keperluan untuk meningkatkan pengetahuan pelajar mengenai komponen WASH tertentu di mana mereka masih kekurangan maklumat. Belia pada masa kini lebih mudah dipengaruhi oleh media sosial, dan ini dapat dibuktikan dari statistik pelajar yang bertindak balas yang mendapatkan maklumat mengenai WASH. Sebanyak 57.8% memperoleh maklumat mengenai WASH di Internet. Membuat program di sekolah agak ketinggalan zaman dan membosankan bagi remaja masa kini. Oleh itu, pihak berkuasa kesihatan, dan juga NGO kesihatan awam, perlu memainkan peranan dengan menggunakan platform media sosial untuk meningkatkan pengetahuan pelajar mengenai WASH.

Kata kunci: KAP, Air, Sanitasi, Kebersihan, Pelajar sekolah menengah

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ABBREVIATIONS

KAP	Knowledge, Attitude and Practice
SPSS	Statistical Package for the Social Sciences
WASH	Water, Sanitation and Hygiene
WHO	World Health Organization
CI	Confidence Intervals
SD	Standard Deviation
MOE	Ministry of Education
JPN	Jabatan Pendidikan Negeri

CHAPTER 1

INTRODUCTION

1.1 Background of Study

The first component of WASH, Water, refers to an essential aspect of human life because it is used for domestic, agricultural, and industrial purposes. Sanitation is the second component of WASH, and it refers to public health issues such as safe drinking water and proper treatment and disposal of human waste, including wastewater. Sanitation also includes avoiding human contact with feces, which encourages people to wash their hands, ideally with soap. WASH's final component, hygiene, is a set of practices performed, including personal habits, to maintain health and avoid disease transmission. It also includes keeping surfaces clean and free of pathogens in the home and workplace, including restrooms. Thus, WASH was intertwined that focused on improving people's life quality. These three components are grouped due to interrelated deficiencies in each area and corrected together to achieve an overall positive impact on public health (Sridhar & Adejumo, 2020). Therefore, WASH is essential in preventing and controlling infectious diseases.

1.2 Problem Statement

The health of people is affected by their knowledge. These have been proven from several studies show that the destitute of WASH knowledge and practice contributes to an increased rate of transmissible diseases. Lack of knowledge of WASH is one of the causes of public health problems in developing countries and is increasingly becoming a significant cause of the spread of infectious diseases (Berhe et al., 2020). WASH efficiency is affected not just by the availability of WASH facilities but also, and most significantly, by individual compliance. School children are often associated with exposure to infectious diseases. These have been linked to a lack of understanding of personal hygiene and related practices (Temitayo, 2016). Most of the time, students spend in the schools for learning purposes and consider school their second home. The majority of lessons, from academics to moral values, are discovered in school. In developing countries, poor hygiene habits are often the cause of public health problems that need attention, and one of the ways is through education. To improve one's degree of understanding, education must be taught. According to Haaple & Probart (2004), schools are recognized as critical settings for promoting health and influencing health-related behaviors, including WASH-related behaviors. Personal hygiene knowledge and practices are essential in preventing infectious diseases and allowing school students to have a healthy and sustainable school life. Despite the importance of assessing knowledge, most existing studies of WASH-related knowledge are confined to poor resource settings. Moreover, several studies found in the literature are only focused on rural

residents but not on youth. Therefore, this study aimed to assess WASH knowledge, attitude, and practices among secondary school students to fill the knowledge gap of this study area.

1.3 Significance of Study

The findings in this study revealed the level of knowledge, attitude, and practice among secondary school students in Petaling District, Selangor, towards WASH. This target group was assessed because they are more likely than other groups to engage in potentially harmful practices to their health, making them vulnerable to WASH-related illnesses. KAP of WASH is significant to decrease WASH-related diseases, especially in places like secondary level institutions. According to Wills, Backett-Milburn, Gregory & Lawton (2005), habits formed in youth are indeed long-lasting and difficult to change in adulthood. Furthermore, secondary school students become targets of hygiene promotion because they are individuals that can be engaged and trained to better practices and behavior towards public health. As a result, children who are effectively educated at school may grow up became people who practice proper hygiene. These will further study the level of knowledge among secondary school students in the Petaling District on health issues involving water, sanitation, and hygiene.

Furthermore, the researcher focused on this area because the Petaling district is the most urban and central of Selangor, yet these are the most affected area from water supply disruptions. Figure 1 shows the water supply restoration plan of Air Selangor from 5th October until 9th October 2020 as published on Air Selangor's official website. The

districts are included with their affected area to be recovered. It shows that the Petaling district is the largest in the affected area for this water crisis.

No	Wilayah	Kumpulan 1 5/9/2020 – 12pm Hingga 7/9/2020 – 12am	Kumpulan 2 7/9/2020 – 12am Hingga 8/9/2020 – 12am	Kumpulan 3 8/9/2020 – 12am Hingga 9/9/2020 – 6am
1	Petaling	9	230	65
2	Klang/Shah Alam	57	85	35
3	Gombak	195	64	15
4	Kuala Lumpur	125	82	40
5	Hulu Selangor	17	0	0
6	Kuala Langat	4	4	0
7	Kuala Selangor	260	4	1
Jumlah Kawasan Pulih		667	469	156
% Anggaran Pemulihan		51.6%	36.3%	12.1%

Figure 1.1: Pelan Pemulihan Bekalan Air di Wilayah Petaling, Klang/ShahAlam, Kuala Selangor, Hulu Selangor, Gombak, Kuala Langat Dan KualaLumpur (Air Selangor, 2020)

Most of the cities are being cut off their clean water supply. This study purposely deepens the understanding of WASH information, attitudes, and factors that influence behavior. With such information, related bodies can implement strategic interventions to increase the level of awareness on WASH. In addition, the findings could be served as a baseline to assess the impact of WASH interventions inMalaysia.

1.4 Research Questions

This study consists of several research questions that want to be answered,namely :

i. What is the sociodemographic factor of the secondary school's students?

ii. What is the level of KAP on WASH among students?

iii. Is there any association between KAP levels and sociodemographiccharacteristics and of WASH?

iv. Is this study significant, and will it generate baseline data before making anyrelevant interventions?

1.5 Objectives

1.5.1 General Objective

This study aims to determine the level of KAP on WASH among secondaryschool students in Petaling District.

1.5.2 Specific Objectives

1. To determine the sociodemographic characteristics of secondary school students in Petaling District.
2. To assess KAP level on WASH among secondary school students in Petaling District.
3. To evaluate the relationship between KAP levels on WASH and sociodemographic characteristics among secondary school students in Petaling District.

1.6 Hypothesis

Main Hypothesis

H_a1: There is an association between the level of KAP on WASH and sociodemographic characteristics among secondary school students in the Petaling district.

Sub Hypothesis

H_a1a: There is an association between knowledge on WASH and Gender amongsecondary school students in the Petaling district.

H_a1b: There is an association between attitude on WASH and Gender amongsecondary school students in the Petaling district.

H_a1c: There is an association between practice on WASH and Gender amongsecondary school students in the Petaling district.

H_a1d: There is an association between knowledge on WASH and Ethnicity amongsecondary school students in the Petaling district.

H_a1e: There is an association between attitude on WASH and Ethnicity amongsecondary school students in the Petaling district.

H_a1f: There is an association between practice on WASH and Ethnicity amongsecondary school students in the Petaling district.

H_a1g: There is an association between knowledge on WASH and parent's educationlevel among secondary school students in the Petaling district.

H_a1h: There is an association between attitude on WASH and parent's educationlevel among secondary school students in the Petaling district.

H_a1i: There is an association between practice on WASH and parent's educationlevel among secondary school students in the Petaling district.

1.7 Conceptual Framework

Figure 1.2 shows all the variables that will be included in this study. The population that will be studied is National secondary school students (Sekolah Menengah Kebangsaan) at Petaling district consist of Petaling Perdana and Petaling Utama zone. The dependent variable in this study is Water, Sanitation, and Hygiene (WASH), whereby the independent variable is Knowledge, Attitude, and Practice (KAP). The relationship between all other potential factors with knowledge, practice, and attitude will also be determined and controlled in this study.

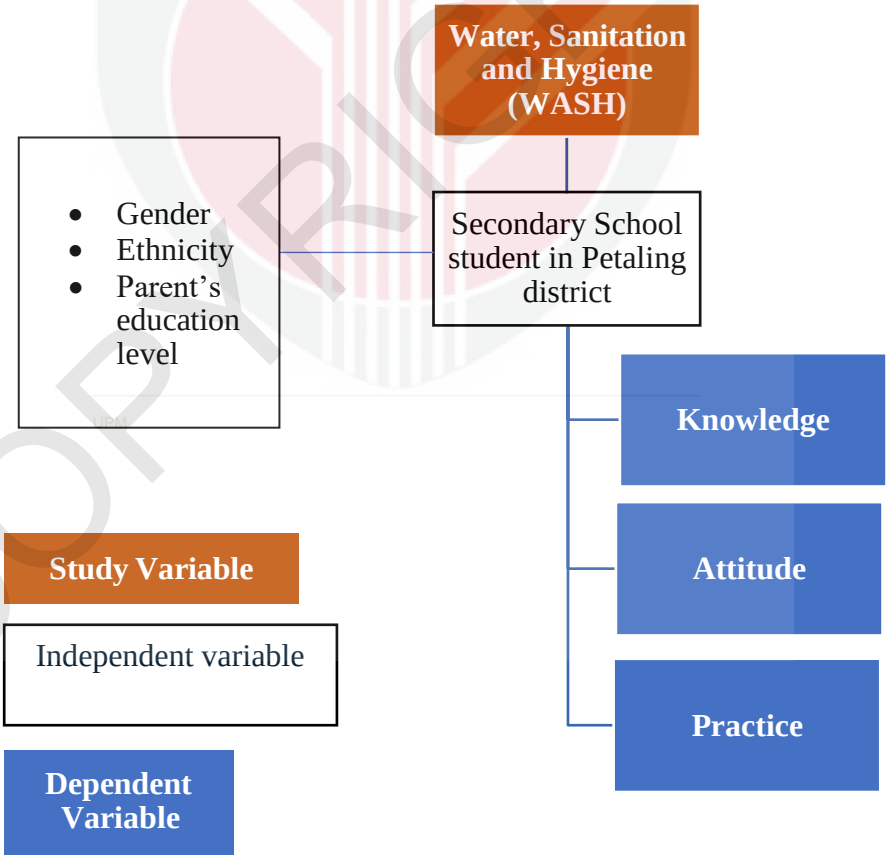

Figure 1.2: Conceptual Framework

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The advantages of having a better drinking water supply can only be effectively experienced if there's enough good accessibility to sanitation facilities and excellent personal hygiene. According to World Health Organization (2018), access to clean drinking water, sanitation, and adequate hygiene (WASH) facilities contribute to improving the quality of health, welfare, and development of the population. However, in WHO 2019's research, approximately 90 million people in the Western Pacific Region (WPR) still do not have access to safe drinking-water facility while 400 million do not have access to a primary sanitation facility. The Region comprises 28 countries from the Pacific, Oceania, and Asia. This includes Cambodia, China, Malaysia, Philippines, Vietnam, Australia, Brunei, Cook Islands, Fiji, Japan, Kiribati, Laos, Marshall Islands, Micronesia, Mongolia, Nauru, New Zealand, Niue, Palau, Papua New Guinea, Samoa, Singapore, Solomon Islands, South Korea, Taiwan, Tonga, Tuvalu, Vanuatu.

Contaminated water and poor sanitation are linked to the

transmission of diseases and become threats to the public. With appropriate actions and improvements in sanitation and hygiene and access to clean water, the population affected can be reduced and achieved the most excellent health benefits. In attaining the 6th Sustainable Development Goal, clean water and sanitation, we must provide the essential infrastructure and encourage hygiene.

The year 2019 witnessed a clean water resource crisis involving communities in city of Petaling district due to severe water leakage at the 1800mm pipe stretch in Section 16, Petaling Jaya as reported by Zolkepli in The Stars (2019). The history of water crises recurred at 15th October 2020, where the community in the Klang valley involving 1,292 areas including Petaling district, have experienced a crisis of water supply disruptions. This is because there are irresponsible parties who pollute four Sungai Selangor which are the raw water sources for water treatment plants as reported by Bernama news (2020). As a result of this water crisis, the affected population had to cut off water due to limited clean water resources. Air Selangor Sdn. Bhd. responsible for the largest water operator service in Selangor that distributes safe and clean water supply to consumers has provided emergency water aid to ensure that residents in the impacted areas have enough water during the disruption (New Straits Time, 2019).

In this section, the current situation of WASH will be discussed. Studies and articles that investigated the KAP of WASH are selected for

the review. Keywords used to search are such as WASH, KAP, and a school student.

2.2 Water, Hygiene and Increased Burden of Diarrhoeal Diseases

Water shortages often occur in Malaysia, especially in areas with high populations that cause insufficient water resources. A limited clean water supply is always associated with pollution, corruption, inefficiency, and global warming phenomenon, which resulted from water shortage in part of Malaysia's state (Haliza, 2014). In addition, the burden of disease from WASH had been a significant concern of the WHO and has been included in WASH-related risk factor research (Prüss, Kay, Fewtrell & Bartram, 2002). As a result, diseases related to water, sanitation, and hygiene are more affecting poorer members of society due to limited access to services or exposure to a polluted environment compared to the wealthy ones. Therefore, WASH improvement will help reduce the spread of waterborne diseases (Yaya et al., 2018).

2.3 The Knowledge of Water, Sanitation, and Hygiene (WASH) and WASH- related diseases

In this fast-paced development, knowledge of water, sanitation, and hygiene (WASH) must be focused on the global burden, water-borne disease. Unsafe WASH is a significant reason for several diseases, such as cholera, diarrhea, shigellosis, typhoid fever, dengue, trachoma, and malaria (Prüss- Ustün et al., 2004). It becomes outspread by inefficient water and sanitation management.

In recent studies of Mourad, Habumugisha, and Sule (2019), the assessment of knowledge of the WASH-related disease has been conducted, and most of the students (50–99%) still cannot identify the leading causes of the WASH-related diseases. This study shows that most adolescents may not be exposed to educational programs related to WASH, and conditions arise from WASH problems.

2.4 Knowledge, Attitude, and Practices

The Knowledge, Attitude, and Practice (KAP) survey is commonly conducted to collect information from a specific population on the knowledge (i.e., how they understand), attitudes (i.e., how they were thinking), and practices (i.e., how they done). In addition, the KAP survey will help intervention planners design, implement, and evaluate knowledge gaps, cultural beliefs, or behavioral patterns that may facilitate understanding and action and define effective programs and activities (Salahideen, 2018). A better understanding of the disease burden, including factors and the efficacy of alternative measures to reducing that burden, is the foundation for developing effective intervention methods. Structured standardized questionnaires consist of both qualitative and quantitative data usually become the instrument for evaluating KAP.

CHAPTER 3

METHODOLOGY

3.1 Introduction

This chapter discussed the study design and selection used to collect data. In addition, this chapter described the population study, sampling methods, instruments,reliability and validity of instruments, and data analysis procedure.

3.2 Research Procedure

This section explained the process taken for the entire research study, starting fromidentifying the problem statement and reporting study findings.

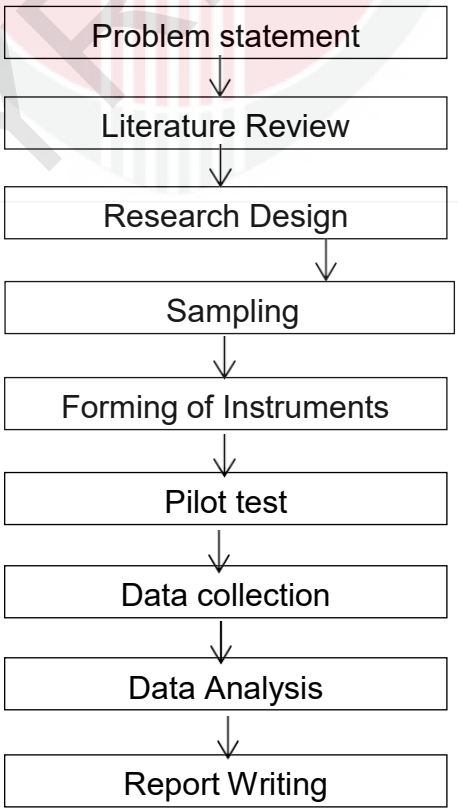

Figure 3.1 Flowchart of Research Study

3.3 Study Design

In this study, a cross-sectional study design was used to determine the level of knowledge, attitude, and practices among secondary school students in Petaling District, Selangor, towards WASH. This design is appropriate for the collection of quantitative data on numerous variables at one time (Walliman, 2018).

3.4 Study Location

This study was conducted in Petaling district school. Petaling district was divided into 4 Mukim which were Mukim Bukit Raja, Mukim Petaling, Mukim Damansara, and Mukim Sungai Buloh. The latest statistic from the official website of Selangor State Education Department in 2020 showed that there are 69 National secondary schools (*Sekolah Menengah Kebangsaan*) in the Petaling district. Therefore, four schools are selected as representatives from each Mukim in the Petaling district.

3.5 Subject Selection

The study population will be secondary school students in the Petaling district. However, the study sample will be chosen from National secondary school (Sekolah Menengah Kebangsaan) students. In addition, according to the official website of Selangor State Education Department, in 2020, the total enrolment for the National secondary school student within the district of Petaling is 95, 131. The limitation of this study is researcher only focuses on Form 4 students. The election was initially involving from Form 3, 4, and 5 as study samples. However, due to

instructions from the Ministry of Education, Form 3 and 5 students need to be excluded from the study. The reason researchers choose students from upper secondary school (from 15-17 years old) is they are in the age group that is more capable of justifying their own decisions, including what is right and what is wrong (CDC, 2019). They tend to answer the questions without any help from parents or others, therefore no bias from their opinion.

3.5.1 Sampling Method

The sampling methods used are multi-staged cluster sampling which includes cluster and simple random sampling in selecting schools and students.

3.5.2 Sample Size Determination

Sample size calculation purposely determines the number of samples needed to detect significant changes in measured parameters after data gathering (Pourhoseingholi, Vahedi & Rahimzadeh, 2013). The researcher selects the sample size method used before from a previous study of (Mbroh, 2019). The estimated population of Form 4 students at Petaling district was 15,000. This statistic is supported by an earlier article by *Berita Harian (*2017) in which the total of students taking Sijil Pelajaran Malaysia in the Petaling district was 14,995. Using Krejcie & Morgan's (1970) table (refer to Appendix B) for determining the sample size for research activities, 375 were suggested as a sample of total

National secondary school students in the Petaling district. The researcher increased 5% as non-response rate because they were possible for the respondent to withdraw or not complete the questionnaire response. Hence, the total of respondents needed was 393.

The sample size determination was also calculated using Krejcie & Morgan (1970) formula:

$$s = X^2NP(1-P) \div d^2(N-1) + X^2P(1-P)$$

s= required sample size

X^2= the table value of chi-square for 1 degree of freedom at desired confidence level (3.841)

N= the population size

P= the population proportion (assumed to be .50 since this provide the maximum sample size

d= the degree of accuracy expressed as a proportion (0.50)

Then, mukim of the Petaling district were identified, and there was four mukim total. All schools within each mukim are listed, and one school was selected to represent each mukim in the Petaling district. The lottery method was utilized for the selection of the school to minimize the relevance of bias in the process of random sampling. The lottery method is the most basic and mechanical example of random selection (Saunders,

Lewis & Thornhill, 2012).

After a school was selected randomly from the lottery method, approximately ninety-nine students per school were selected. The researcher contacted the school administration officer for data collection using an email platform. The questionnaire was distributed to random selected student by teacher on duty. Students are chosen from all class level and based on name list provided by the officer. All respondents were randomly chosen with few characteristics where the respondents of this study represent all races: Malay, Chinese, Indian, and Others.

Both male and female respondents are selected equally. This is because male and female respondents are distributed equally, and the percentages were 51% and 49%, respectively. This percentage is based on total population by age group, gender, ethnic group, strata, and state in Malaysia from the 2010 Census Statistic. Figure 3.2 showed the sampling process based on simple random sampling in selecting the schools using lottery method.

3.5.3 Inclusion and Exclusion Criteria

The sample study was selected for sixteen-year-old students and from National Daily Secondary School (SMK). The students must be Malaysian as this study will be representative of Malaysian students. The study sample was selected according to the inclusion and exclusion criteria as mention in Table 3.1.

Table 3.1: Inclusion and Exclusion Criteria

Inclusion criteria	Exclusion criteria
• Age of 16 years old (Form 4 students) • From National Secondary School(SMK) • Malaysian	• Students who do not agree toparticipate • Students who do not get consentfrom parents/guardian

3.6 Flow Process of Data Collection

The data collection from the study sample was conducted through a questionnaire. The overall process of data collection and procedures was explained inFigure 3.2 below.

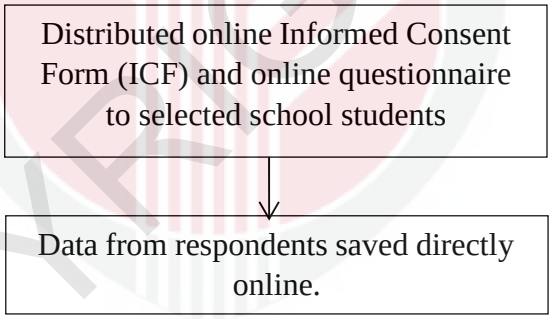

Figure 3.2: Flowchart of Process Data Collection

3.7 Materials and Procedures

An instrument used in this study was a combination of validated questionnaires used previously by Berhe et al. (2020) and Mourad, Habumugisha & Sule (2019) with a few modifications according to the relevant study sample. Before conducting the study, approval was obtained from the Ethics Committee for Research Involving Human Subjects (JKEUPM) Universiti Putra Malaysia.

3.7.1 KAP Questionnaire

The subject, which the study will be conducted, must be identified. Specifically, WASH was selected as the subject area for this study in which the knowledge, attitude, and practice in this issue are being measured. The questionnaire consisted of thirty-five questions that were categorized into four main sections: sociodemographic characteristics and general information, knowledge, attitude, and practice. The questionnaire mainly comprised multiple choice and Likert scale questions.

Part I consisted of sociodemographic characteristics in which contained items on the gender, race, and parent's education level. For general information, researchers include a type of drinking water used at home and the availability of handwashing facilities at the school—these questions provided for assessing contribution factors to the practice of students towards WASH.

Part II consisted of the knowledge section question in which intended to test the knowledge of respondents on WASH and WASH-related disease. This part used multiple-choice questions with one point given for each correct answer. A total of eleven points represented for eleven questions. This part used multiple-choice questions with one point given for each correct answer. A total of eleven points represented for eleven questions.

Part III consisted of the attitude section question in which intended to gauge the prevailing attitudes, beliefs, and misconceptions among students about WASH. The attitude of students toward WASH was

assessed using a five-point Likert scale divided into three characteristics; attitude on access, quality, and use of water, attitude on sanitation and health promotion and attitude on hand hygiene.

Part IV was consisted of the practice section in which intended to assess the practices of the respondents concerning of WASH. This part used multiple choice questions and score for students with positive practice was given 1 point for each question while 0 point was given for negative practice. A total of six were represents for six questions.

3.7.2 Validation of KAP Questionnaires

After questions prepared, questionnaire was validated by pre-testing to a same characteristic of respondent but in different area. The researchers conducted this pre- test to assess the effectiveness in providing information about WASH. In addition, this pre-test intended to evaluate the degree of their interpretation and understanding towards WASH questions.

3.7.3 Administration of Questionnaire

The questionnaire in both English and Malay language administered to respondents. The questionnaire took about seven to ten minutes to be answered. The responded questionnaire was recorded after the respondents submitted theirquestionnaire.

3.8 Data Analysis

After the questionnaire was distributed, data from respondents obtained. After data collection held, data was analysed using Statistical

Package for the Social Sciences (SPSS) Version 25 software for assessing the level of KAP on WASH among secondary school students in Petaling District. The KAP level was categorized into 'Low', 'Moderate' and 'High'. Method for scoring KAP used in this study was previously used from Mbroh (2019) study.

Table 3.2 Scoring Calculation for Knowledge, Attitude and Practice level

Category	Score
Low	<50%
Moderate	50-74%
High	> 75%

3.8.1 Statistical Analysis

The statistical test was conducted according to certain study objectives as shown in Table 3.2.

Table 3.3: Objectives and its suitable Statistical Test

Objectives	Statistical Test
To determine the sociodemographic characteristics of secondary school students in Petaling District.	Descriptive analysis
To assess KAP level on WASH among secondary school students in Petaling District.	Descriptive analysis

To evaluate the significant relationship between KAP levels on WASH and sociodemographic characteristic among secondary school students in Petaling District.	Chi square

3.9 Reliability

Reliability coefficient analysis will be performed on the knowledge, attitude and questions. Table 3.4 presents the Cronbach's Alpha where to determine the internal consistency of the instruments. The Cronbach's Alpha results a number ranged from 0 to 1. According to Manerikar (2015), the acceptable reliability start from 0.6 and above and Figure 3.5 below shows the Cronbach's alpha with the internal consistency while Figure 3.6 presents the result from conducting reliability test.

Table 3.4 Cronbach's Alpha and Internal Consistency

Cronbach's Alpha	Internal Consistency
$\alpha = 0.9$	Excellent
$0.7 = \alpha < 0.9$	Good
$0.6 = \alpha < 0.7$	Acceptable
$0.5 = \alpha < 0.6$	Poor
$\alpha < 0.5$	Unacceptable

(Source: Vijaya Manerikar & Sumeet Manerikar (2015). Cronbach's Alpha.Research Communication Journal)

Table 3.5 Results from Cronbach's Alpha

Items Analyzed	N	Reliability Coefficient (Cronbach's alpha)

Knowledge on Water, Sanitation andHygiene (WASH)	11	0.552
Attitude on Water, Sanitation andHygiene (WASH)	13	0.885
Practice on Water, Sanitation and Hygiene (WASH)	6	0.614

CHAPTER 4

RESULTS

4.1 Introduction

This chapter presented the findings of quantitative analysis of level of KAP towards WASH among secondary school students in Petaling district. Out of 393 students contacted by researcher to filled online questionnaire, 384 students (response rate= 97.7%) response to answer the questionnaire. If non-response rate excluded, therefore 100% of response rate is achieved since this study only need 375 study samples.

4.2 Descriptive Analysis

The descriptive findings focused on the sociodemographic characteristic and general information of students including gender, ethnic and parent's education. Researchers also used descriptive analysis for assessing the level of knowledge, attitude and practice levels on WASH of the students

4.2.1 Respondent's Sociodemographic and General Information

This part focused on sociodemographic detail of the students and it were analysed through descriptive statistic. Table 4.2 shows the findings of sociodemographic and general information of students that are collected from the survey.

Table 4.1 shows students who completed the questionnaire are 43.5% (167) are male student while female student are 56.5% (217). The ethnic proportion obtained was Malay (64.6%), Indian (18.8%), Chinese (13.5%) and others (3.1%). Composition of ethnic did not reflect the proportion of registered National secondary school students, but it did reflect the ratio of students in the sampling areas. In addition, 81.8% (314) of students are from educated family background.

Out of total, 87.5% (336) of students are from family that apply water filter system such as Coway, Cuckoo, ESpring, etc., as their main source of drinking water at home. General question such as type of drinking water sources was purposely to determine either student's drinking water source was from clean water supply or vice versa. . Students and their families would be among the affected communities if the water supply were disrupted. Other than using filter system, 12.5% of family (1 student represent 1 family) bought mineral water bottled.

Researchers also obtained data about availability of hand soap and water at school's handwashing facilities. Findings show that 86.5% (332) of students respond to only water available at handwashing facilities in the school. This might affect the practical of student's towards personal hand hygiene at school.

Table 4.1 Respondent's Sociodemographic Background and GeneralInformation (N=384)

Variable	N	(%)
1. Gender		
Male	167	43.5
Female	217	56.5

2. Ethnicity		
Malay	248	64.6
Chinese	52	13.5
Indian	72	18.8
Others	12	3.1
3. Parent's education level		
Primary level	0	0
Secondary level	70	18.2
Tertiary level	314	81.8
4. What is the main source of drinking water used at home?		
Filtered/treated water	336	87.5
Mineral bottled water	48	12.5
5. Are both soap and water available at the handwashingfacilities in the school?		
Yes, Water and soap	52	13.5
Water only	332	86.5

4.2.2 Level of Knowledge on Water, Sanitation and Hygiene (WASH)

In this part, percentage of knowledge on WASH for each item was analysed using descriptive analysis. Table 4.2 shows the findings of percentage knowledge of student towards WASH.

There were 66.7% (256) of students who responded of getting information about WASH. Half of students (58.7%) obtained the information from Internet followed by community programs that have the same rate as school which are 13% (50). A total of 103 students (26.8%) who responded they got information about water quality and 119 (31.0%) students obtained hygiene information. Findings also show that none of the students got information about sanitation.

It is noted that 93.5% (359) of students agreed that unsafe water can cause diarrhea. However, 6.5% of them were risky to get diarrhea as they answered 'No' for the knowledge about the risk of getting diarrhea using unsafe water. Among the total number of student, 98.7% (379) knew that animal faeces can cause diseases towards human.

About 99.2% of students said a bathroom with a toilet and handwashing sink is essential for every house. Since they are in the urban area, no one has experienced difficulty accessing sanitation facilities such as toilets and handwashing sinks. From their opinion, 99.0% (380) responded 'Yes' about water was able to get contaminated and 99.20% agreed whoever consumed contaminated water, can expose to infectious disease.

It is also noted that 100% (384) of student have access to use clean water as a medium for hand washing and have a knowledge of consequences if they are not washing their hand. Out of total, 86.20% (331) students know about cholera and dysentery. Dengue and diarrhea are being voted 100% as disease that related to WASH.

Table 4.2 Frequency and Percentage of Knowledge on WASH among secondaryschool student

Variable	N	(%)
1. Have you got information on WASH inthe last 6 months?		
Yes	128	33.3
No	256	66.7
2. Where did you get the source of information about		

Water, Sanitation and Hygiene (WASH)?		
Internet	222	57.8
Radio/Television	0	0
Newspaper/Magazine	0	0
School	50	13.0
Health program community (in the last 6 months)	50	13.0
Do not know	162	42.2
3. What information(s) is obtained about Water, Sanitation and Hygiene (WASH)?		
Water Quality	103	26.8

Toilet/Sanitation	0	0
Hygiene	119	31.0
Do not know	162	42.2
4. In your opinion, usage of unsafe waterwill cause diarrhea?		
Yes	359	93.5
No	25	6.5
5. Do animal faeces cause diseases tohuman?		
Yes	379	98.7
No	5	1.3
6. In your opinion, is the toilet essential andobligatory for every household?		
Yes	381	99.2
No	3	0.8
7. In your opinion, does water can get contaminated?		
Yes	380	99.0
No	4	1.0
8. What are the consequences of using contaminated water?		
Expose to diseases	381	99.2
Does not expose to diseases	3	0.80
Do not know	0	
9. Do you use a clean water source for handwashing?		
Yes	384	100.0
No	0	0
10. What are the consequences of not washing hands?		
Expose to various diseases	384	100.0
Does not expose to diseases	0	0
Do not know	0	0
11. To your knowledge, what are diseasesthat related to Water, Sanitation and Hygiene (WASH)? (more than 1 option)		

Cholera	331	86.20
Typhoid	265	69.00
Diarrhea	384	100
Malaria	318	82.80
Dysentery	331	86.20
Dengue	384	100

4.2.2.1 Score of Knowledge on Water, Sanitation and Hygiene

For the knowledge section, the score ranged from 0 to 11. Table 4.3 shows respondent mean and standard deviation of knowledge obtained from the descriptive analysis. It concludes that the mean score for WASH knowledge of secondary school students in the Petaling district is 9.28 +/- 1.27 SD and the number of students who answered the survey was 384. Table 4.4 shows three categories of knowledge scores with the respective score for each category: Low, Moderate and High. Based on Table 4.4, 59.9% (230) had a high level of knowledge while 40.1% (154) had a moderate level for knowledge. None of the student reportedly had low knowledge on WASH.

Table 4.3 Mean Score of Knowledge on WASH among secondary school student

Mean	SD	N	Variance	Skewness	SE Skew	Range
9.28	1.27	384	1.614	-0.023	0.125	4.00

**SD= Standard Deviation, SE=Standard Error*

Table 4.4 WASH knowledge categories

Category	**Totals**	**Low**	**Moderate**	**High**
Score of Knowledge on WASH	11	>50%	50-74%	75%
Respondents (N)	384	0	154	230
%	100	0	40.1	59.9

4.2.3 Level of Attitude on Water, Sanitation and Hygiene (WASH)

WASH Attitude questionnaire with 13 item questions with 5-point Likert scale (‘1’= strongly disagree, ‘2’= disagree, ‘3’= Neutral, ‘4’= agree, ‘5’= strongly agree) was used as survey instrument to test the attitude of students on WASH.

Student’s attitude score towards WASH were categorized by asking about their opinions to either agree or disagree with the questionnaire statements. These attitude questions covered 3 areas of WASH which were access, quality, and use of water, sanitation and health promotion as well as hand hygiene. Table 4.5 shows the descriptive statistics of WASH attitude among students.

The attitude towards access, quality and use of water was tested in question 12,13,14,15 and 16. Based on the finding of the study, 100% of students agreed that clean and safe water is important when one is healthy and sick and with the usage of safe water, it can prevent human from waterborne disease such as diarrhea. All of them (100%) agreed that container used for keeping water supply must be always clean and tightly closed and boiling water can helps to remove microorganisms that cause disease before drinking.

Question 17 until 20 was purposely used to test student’s attitude towards sanitation and health promotion including. According to the findings, 88.3% student have strongly agreed that diarrheal disease are infectious and caused by poor personal hygiene and sanitation. Question 19 which mentioned about potential of breeding sites for vectors such as

mosquito, fly and rodent due to improper management of liquid and solid waste were 85.4% strongly agreed by students.

Last but not least, for the hand hygiene attitude, 100% students have overall positive attitude towards practice of hand washing before and after eating food as well as after using washroom in order to prevent communicable diseases. They are also agreed that washing hand without soap is not enough to sanitize hand completely and it is related to transmission of infectious diseases.

Table 4.5 Frequency and Percentage of Attitude on WASH among secondaryschool student

Variables	Strongly disagree, N (%)	Disagree, N (%)	Neutral, N (%)	Agree, N (%)	Strongly Agree, N (%)
Attitude on access, quality, and use of water					
12. Clean water consumption is important when one is healthy and sick	0	0	0	45 (11.7)	339 (88.3)
13. Safe and adequate use of water can prevent exposure to waterborne diseases such as diarrhea	0	0	0	54 (14.1)	330 (85.9)
14. Defecating near water source can cause contamination	0	0	0	58 (15.1)	326 (84.9)

15. Water containers must always be clean and tightly closed	0	0	0	57 (14.8)	327 (85.2)
16. Boiling water before consumption helps to remove disease causing microorganisms	0	0	0	85 (22.1)	299 (77.9)
Attitude on sanitation and health promotion					

17. Diarrheal diseases are caused by poor personal hygiene and sanitation.	0	0	0	68 (17.7)	316 (82.3)
18. Diarrheal diseases are infectious	0	0	0	54 (14.1)	330 (85.9)
19. Poorly managed liquid or solid waste can be breeding sites for mosquitoes, flies and rodents	0	0	0	56 (14.6)	328 (85.4)
20. Animal faeces if not properly managed will causes health problem	0	0	4 (1.0)	53 (13.8)	327 (85.2)
Attitude on hand hygiene					
21. Washing hand after using toilet prevents infectious diseases	0	0	0	73 (19.0)	311 (81.0)
22. Washing hands with water alone is not enough to sanitize hands	0	0	0	129 (33.6)	255 (66.4)
23. Washing hands is more important before and after eating food	0	0	0	91 (23.7)	293 (76.3)
24. Hand	0	0	0	59 (15.4)	325 (84.6)

hygiene and diinfectious disease are related

4.2.3.1 Score of Attitude on Water, Sanitation and Hygiene (WASH)

This section presented the mean score of the respondent's attitude. Table 4.6 explains the mean attitude on WASH among students derived from the analysis was

62.97 +/- 3.28 SD, and the number of participants was 384. Table 4.7

summarizes that 89.6% (344) of the secondary school students in the Petaling district score more than 75% on attitude, and 10% (40) were categorized in middle class.

Table 4.6 Mean Score of Attitude on WASH among secondary school student

Mean	SD	N	Variance	Skewness	SE Skew	Range
62.97	3.28	384	10.775	-1.950	.125	15.00

**SD= Standard Deviation, SE=Standard Error*

Table 4.7 WASH Attitude categories

Category	**Totals**	**Low**	**Moderate**	**High**
Score of Attitude on WASH	65	>50%	50-74%	75%
Respondents (N)	384	0	40	344
%	100	0	10	89.6

4.2.4 Level of Practice on Water, Sanitation and Hygiene (WASH)

WASH practice was measured with six direct questions as a survey instrument to test the practicality of students toward WASH. Respondents are asked to tick the appropriate option indicating their practical of WASH at the school as well as home. The score for students with positive practice was given 1 point for each question,

while 0 points was given for negative practice. Table 4.8 illustrates descriptive statistics of practice on WASH among secondary school students.

Based on their answer in the practice section, 100% of students said they are washing their hands after using the toilet, before and after eating—however, only 87% practice with enough material for

handwashing such as handsoap and clean water. Therefore, 13% of students were risky to get WASH-related diseases such as diarrhea and cholera. The researcher also asked about their hygiene, either they clip their hand nails regularly or not. The majority of them said they are practice nail clipping at least twice a month. Overall, 100% of students claimed they are practicing good personal hygiene and WASH.

Table 4.8 Frequency and Percentage of Practice on WASH among secondaryschool students

Variable	N	(%)
25. Do you wash yourhand after using toilet/washroom?		
Yes	**384**	**100.0**
No	**0**	**0**
26. Are both soap and water available at the handwashing facilities in the home?		
Yes, Water and soap	**328**	**85.4**
Water only	**56**	**14.6**
27. Usual material usedfor hand washing at school		
Water only at school	**282**	**73.4**
Water and hands soap at school	**102**	**26.6**

28. Usual material used for hand washing at home		
Water only in home	**50**	**13.0**
Water and hand soap in home	**334**	**87.0**
29. Do you clip your hand nails regularly (at least twice in a month)?		
Yes	**384**	**100.0**
No	**0**	
30. Overall, do you practice on personal hygiene (e.g.: washing hand) at school and home?		
Good	**384**	**100.0**
Poor	**0**	

4.2.4.1 Score of Practice on Water, Sanitation and Hygiene (WASH)

This part will explain the score for student's practice on WASH. Table 4.9 explains the mean score for practice on hand hygiene derived from the descriptive analysis was 4.71 +/- 0.68 SD. Table 4.10 illustrates that the majority of students (85.4%) had a high level of practice on WASH. It is also noted that 14.6% (56) of the students had a low level in the practice of WASH.

Table 4.9 Mean Score for Practice on WASH among secondary school student

Mean	SD	N	Variance	Skewness	SE Skew	Range
4.71	0.68	384	0.474	-2.075	.125	2.00

**SD= Standard Deviation, SE=Standard Error*

Table 4.10 Practice on WASH categories

Category	Totals	Low	Moderate	High
Score of Practice on WASH	6	>50%	50-74%	75%
Respondents (N)	384	0	56	328
%	100	0	14.6	85.4

4.3 Chi-Square

This section was focus on association between categorical variables using chi square. Findings below show the relationship between level of KAP levels on WASHand gender.

4.3.1 The Relationship between Level of Knowledge, Attitude and Practice onWASH and Gender

The aim of this hypothesis (H_a1a- H_a1b) is to analyse the relationship between knowledge, attitude and practice on WASH and gender. The chi square test from Table 4.17 shows that there is significant association (p=0.00, <0.05) in the level of knowledge on WASH and gender. These values are lower than the level of significant; that is p<0.05. Thus, H_a1a is accepted.

H_a1a: There is significant association between **knowledge** on WASH and **Gender** among secondary school students in Petaling district.

Table 4.11 Relationship between Level of Knowledge on WASH and Gender

Gender	Knowledge on WASH			X^2	p-value
	Low	Moderate	High		
Male	0	3	164	180.541[a]	.000
Female	0	151	66		

**p< 0.05 significant*

However, level of attitude on WASH and student's gender cannot be associate since only 1 categorical variable available which were gender and KAP attitude has constant data. Therefore, Ha1b is rejected. Table 4.12 shows female havehigh attitude on WASH than male students.

H_a1b: There is significant difference between **attitude** on WASH and **Gender** among secondary school students in Petaling district.

Table 4.12 Relationship between Level of Attitude on WASH and Gender

Gender	Attitude on WASH			X^2	p-value
	Low	Moderate	High		
Male	0	23	144	3.566^a	.043
Female	0	17	200		

**p< 0.05 significant*

Table 4.13 shows another significant relationship between level of practice on WASH and gender. Findings shows p=0.00, <0.05 between level of practice on WASH with gender, thus, H_a1c is accepted . These values are lower than the level of significant; that is p<0.05. Female student was found the highest at moderate practice with a total of 217 out of 384 respondents.

H_a1c: There is significant relationship between **practice** on WASH and **Gender** among secondary school students in Petaling district.

Table 4.13 Relationship between Level of Practice on WASH and Gender

Gender	Practice on WASH			X^2	p-value
	Low	Moderate	High		
Male	0	53	114	69.804^a	.000
Female	0	3	214		

**p< 0.05 significant*

4.3.2 The Relationship between Level of Knowledge, Attitude and Practice onWASH and Ethnicity

Based on Table 4.14, summarizes that there is significant relationship (p=.00,p<0.05) between knowledge on WASH and ethnicity among secondary school students. Fischer's exact test take place since there is 4 cells have expected count less than 5. Therefore, Ha1d can be accepted. Moreover, Indian ethnic was found highest in number in high knowledge group while majority of Malay students have moderate knowledge on WASH.

H_a1d: There is significant relationship between **knowledge** on WASH and **Ethnicity** among secondary school students in Petaling district.

Table 4.14 Relationship between Level of Knowledge on WASH and Ethnicity

Ethnic	Knowledge on WASH			X^2	p-value
	Low	Moderate	High		
Malay	0	146	102	123.190*b*	.000
Chinese	0	0	52		
Indian	0	6	66		
Others	0	2	10		

**p< 0.05 significant b= Fischer's Exact Test*

Table 4.15 shows no significant relationship between level of attitude onWASH and ethnicity. Therefore, H_a1e is rejected.

H_a1e: There is significant relationship between **attitude** on WASH and **Ethnicity**
among secondary school students in Petaling district.

Table 4.15 Relationship between Level of Attitude on WASH and Ethnicity

Ethnic	Attitude on WASH			X^2	p-value
	Low	Moderate	High		
Malay	0	29	219	9.684*b*	0.017

Chinese	0	0	52
Indian	0	10	62
Others	0	1	11

**p< 0.05 significant*

H_a1f: There is significant relationship between **practice** on WASH and **Ethnicity**
among secondary school students in Petaling district.

Table 4.16 Relationship between Level of Practice on WASH and Ethnicity

Ethnic	Practice on WASH			X^2	p-value
	Low	Moderate	High		
Malay	0	48	200	29.305*b*	.000
Chinese	0	2	50		
Indian	0	1	71		
Others	0	5	7		

**p< 0.05 significant; b=Fischer's Exact test*

The chi square analysis from Table 4.16 shows that there is significant relationship (p=.00, <0.05) in the level of practicee on WASH and ethnicity. These values are lower than the level of significant; that is p<0.05. Thus, H_a1f is accepted.

4.3.3 The Relationship between Level of Knowledge, Attitude and Practice onWASH and Parent's Education level

Results in Table 4.17 also revealed that there is significant relationship between knowledge on WASH with parent's education level (p=0.00, p>0.05). Hence, Ha1g for this current study is accepted.

H_a1g: There is significant relationship between **knowledge** on WASH and **parent's education level** among secondary school students in Petaling district.

Table 4.17 Relationship between Level of Knowledge on WASH and Parent'sEducation level

Parent's Education Level	Knowledge on WASH			X^2	p-value
	Low	Moderate	High		
Primary Level	0	0	0	23.756[a]	.000
Secondary Level	0	10	60		
Tertiary Level	0	144	170		

**p< 0.05 significant b=Fischer's exact test*

However, Table 4.18 revealed that attitude level among students on WASH had no significant relationship with parent's education level since SPSS cannotcompute of constant data. Thus, Ha1h is rejected.

H_a1h: There is significant relationship between **attitude** on WASH and **parent's education level** among secondary school students in Petaling district.

Table 4.18 Relationship between Level of Attitude on WASH and Parent'sEducation level

Parent's Education Level	Attitude on WASH			X^2	p-value
	Low	Moderate	High		
				7.411[a]	.006
Secondary Level	0	1	69		
Tertiary Level	0	39	275		

**p< 0.05 significant*

Furthermore, Table 4.19 shows there is no significant association in between level of practice towards WASH with parent's education level ($p=0.077$, $p<0.05$) and thus, H_a1i is rejected. Although most of the students come from educated family background, their level of practicality towards WASH does not have relationship with the parent's education level.

H_a1i: There is significant relationship between **practice** on WASH and **parent's education level** among secondary school students in Petaling district.

Table 4.19 Relationship between Level of Practice on WASH and Parent'sEducation level

Parent's Education Level	Practice on WASH			X^2	p-value
	Low	Moderate	High		
Secondary Level	0	6	64	2.484[a]	.0115
Tertiary Level	0	50	264		

**p< 0.05 significant*

To conclude the analysis of relationship between levels KAP of WASH with sociodemographic using chi square analysis, Table 4.20 revealed the findings of analysis together with hypothesis as well as statistical value.

Table 4.20 Summary of chi square test

Main Hypothesis	Sub Hypothesis	Statistical value and Results
H_a1: There are an association between level of KAP on WASH and Sociodemographic characteristic among secondary school students in Petaling district.	H_a1a: There is an association between **knowledge** on WASH and **Gender** among secondary school students in Petaling district.	*(p=0.000, p< 0.05)* Accepted
	H_a1b: There is an association between **attitude** on WASH and **Gender** among secondary school students in Petaling district.	*(p=0.059, p< 0.05)* Accepted
	H_a1c: There is an association between **practice** on WASH and **Gender** among secondary school students in Petaling district.	*(p=0.000, p< 0.05)* Accepted
	H_a1d: There is an association between **knowledge** on WASH and **Ethnicity** among secondary school students in Petaling district.	*(p=0.000, p< 0.05)* Accepted
	H_a1e: There is an association between **attitude** on WASH and **Ethnicity** among secondary school students in Petaling district.	*(p=0.017, p< 0.05)* Accepted
	H_a1f: There is an association between **practice** on WASH and **Ethnicity** among secondary school students in Petaling district.	*(p=0.000, p< 0.05)* Accepted
	H_a1g: There is an association between **knowledge** on WASH and **parent's education level** among secondary school students in Petaling district.	*(p=0.000, p< 0.05)* Accepted
	H_a1h: There is an association between **attitude** on WASH and **parent's education level** among secondary school students in Petaling district.	*(p=0.006, p< 0.05)* Accepted
	H_a1i: There is an association between **practice** on WASH and **parent's education level** among secondary school students in Petaling district.	*(p=0.115, p< 0.05)* Rejected

CHAPTER 5

DISCUSSION

5.1 Introduction

The aim of this study was to assess the level of knowledge, attitude and practice on WASH among secondary school students in the Petaling district. Hence, this assessment gives an understanding of students' knowledge, attitude and practice regarding WASH. Besides, the relationship between knowledge, attitude, and practice with sociodemographic characteristics also was determined in this study. This chapter will explain the research findings based on the objectives stated in Chapter 1.

5.2 Discussion on Socio-Demographic Characteristic and Level of KAP based onResearch Objective

The results of this study are based on the data taken from 384 secondary school students in the the Petaling district. Moreover, the findings of this study are based on the self-administered questionnaire that asks their sociodemographic details such as gender, ethnicity, and parent's education level. It is crucial to obtained data from students about their parent's educational level because, according to Chen et al. (2020), parents who had good educational history affects children's knowledge and behavior. Children tend to become better people since their parents also had a good

knowledge and raised them well. Several questions were chosen based on the suitability of the demographic and characteristics of the study sample. Furthermore, the findings of the results are derived from descriptive and chi-square analysis using SPSS software version 25.

To the best of the researcher's knowledge, there is a lack of studies conducted in Malaysia about knowledge, attitude, and practice of WASH. The present study mainly focuses on secondary school students. Hence, it will focus on filling this gap of knowledge. According to Zhu & Xie (2015), in her research, student's positive attitudes are moderately influenced if they have a more significant level of knowledge. This study is important to assess students' knowledge, attitude, and practice about WASH because their literacy level will affect their behaviors and their significant role in health promotion. The student was chosen for health promotion because they are key changers that can influence peers and family (Karkada & Pai, 2016). A research from O'Reilly et al. (2008) said that the knowledge of the student's about hygiene were transfer to parent and significantly change the behavior of the parents. Intervention of school-based WASH also improved student-parent communication about personal hygiene (Karon, Cronin, Cronk, & Hendrawan, 2017). Since health and education are intertwined, healthy students are likely to be holistic. Most WASH-related diseases are infectious such as cholera, typhoid, diarrhea, malaria, and dengue. These mentioned diseases are commonly found in Malaysia, especially in the rural area. Urban and the periurban regions are widely related to dengue cases because it is related to improper management of WASH. Dengue cases can be found highest in number at Selangor state. This was reportedly by *The Straits*

Times in November 2020 when Selangor has topped the list with over 41,000 dengue cases, compared to other states this year. As the study for KAP level related to WASH among youths or communities in Malaysia is not yet available, this preliminary study will explore the knowledge of students in Malaysia about WASH. The following are the review for each objective of the study that has been conducted.

i) Summary of Research Objective 1

The first objective of this study was the determination of a sociodemographic characteristic of secondary school students in the Petaling district. Information such as gender, ethnicity and parent's education level were obtained from the survey. This data is significant for further objective which researcher wants to relate the knowledge, attitude and practice level with these three characteristics. Type of drinking water, daily consumption per student and the availability of material for handwashing at the school also were asked for general information. The findings showed that majority of the respondents are Malay. These distribution by ethnic becomes slightly abnormal because according to Department of Information Malaysia (2017) reported that Bumiputeras recorded the highest percentage at 68.6 percent, followed by Chinese at 23.4 percent, Indians at 7.0 percent and others at 1.0 percent. Percentage of male and female respondents are almost well distributedwhich give 43.5% and 56.5%, respectively.

ii) Summary of Research Objective 2

The second objective of this study was determination levels of knowledge, attitude and practice on WASH. Respondents were asked using online questionnaire which categorized into 3 sections which are Knowledge, Attitude and Practice on WASH. Each section were used different type of question.

A total of 11 questions were asked and mean score of the student's knowledge was 9.28. Based on the descriptive analysis in table 4.4, overall knowledge of WASH was equally distributed between high and moderate knowledge with 59.9% and 40.1%, respectively. Although students in this study had high and moderate knowledge about WASH, the findings showed students was the lack in their knowledge in the area of sanitation. As suggested in Rabbi and Dey's (2013) study, long-term and widespread campaigns can educate individuals about the importance of handwashing, including sanitation facilities. Sanitation practices were also found to have a favorable influence on reducing diarrhea prevalence in all research conducted in developing countries (En & Gan, 2011). Since our study focuses on school students, to create awareness about WASH, school plays a significant role in health promotion among students (Iudici, 2015).

In terms of knowledge about WASH-related diseases, diarrhea and dengue was found to be the most popular WASH-borne disease among students, followed by cholera. The students might aware of the dengue since Selangor state was reportedly the highest rate of Dengue cases (Salim et al., 2021) and awareness campaign about dengue were actively conduct in Selangor area. Compared to study in Vietnam by Noi (n.d.), respondents

recognized diarrhea (62%), parasitic diseases (18.6%), skin diseases (17.6%), eye diseases (11%) and gynecological and obstetrical diseases (3.8%).

Attitude section was categorized into 3 different characteristic; Attitude on access, quality and usage of clean water, Attitude on sanitation and health promotion, Attitude on hand hygiene. This section was measured using 13 item of 5-scale likert scale question as formed in previous studies, Berhe et.al (2020) on WASH among rural communities. About 66.4% of students managed to achieve positive attitude on first characteristic. Based on Table 4.9, 89.6% of students scored high level of attitude on sanitation and health promotion. Statements provided almost agreed by every student as they know to react towards knowledge and practice of WASH. More than 80% of students agreed with the fact that poor personal hygiene and sanitation will cause several infectious diseases. In another country, a study from South Africa found that hygiene attitudes and practices among learners were quite positive. Similar to Mbroh's (2019) study, 80.6% of students have high level attitude towards hand hygiene. For the last characteristic of attitude, more than 80% agreed that washing hand can prevent them from infectious diseases especially after using bathroom. Bathroom considered as the most suitable place for germ growth due to moist condition (Higuera, 2020). Hence, rinse hand with water and soap can avoid spreading microorganism and from getting sick.

Practice sections used 5 multiple choice answer questions type to measure

the practical of student towards WASH and results are derived from descriptive analysis. Frequency and percentage of each item were generated. Based on the findings, the majority of students (85.4%) have scored high in the practice of WASH with a mean score, 4.71 +/- 0.68 SD. However, 73.4% of them are exposed to infectious risk since they reported they only use water as a material for hand washing. The researcher did ask the student in the general information section either the school provides handwashing facilities and materials. About 85.4% said their school doesn't provide sufficient hand washing material in school. This may relate to the student's practice based on question 27th; 73.4% not use hand soap for handwashing at school. Hence, a program for schools also needs to be included for improvements of their WASH. A study from Alexander, Dreibelbis, Freeman, Ojeny, & Rheingans (2013) reported that the provision of soap, handwashing water, and clean toilets improved significantly in intervention schools. Improved WASH infrastructure and resources in schools may have health benefits if soap and water for handwashing are consistently available (Grimes et al., 2017). Another study shows the importance of intervention in schools will reduced student absenteeism (O'Reilly et al., 2008).

iii) Summary of Research Objective 3

This study's third research objective was to evaluate the relationship between KAP level and sociodemographic characteristics; Gender, Ethnicity, Parent's Education level. A significant relationship was noted in all relationships between levels of KAP with gender, ethnicity, and parent's

education level except for practice level and parent's education level. A similar study from Gebreeyessus & Adem (2018) shows that student's knowledge and practice are related to gender. The association between ethnicity and WASH may be attributed to other potential factors such as culture, belief, and religion that may require further studies in the future to determine if there could be additional explanations for these differences. Another study supported a significant relationship between ethnicity and hygiene practices among adolescents (Che Salleh, 2019).

CHAPTER 6

CONCLUSION, LIMITATION & RECOMMENDATION

6.1 Introduction

This chapter focuses on the conclusion for the findings of this research and limitation aroused from the study. The conclusion was the answer to the problem statement and research objective that has been outlined in Chapter 1. The study also addressed some limitations of the study and included recommendations to improve further studies related to the WASH area.

6.2 Conclusion of Study

The outcomes of this current study clearly indicated that most of students have high knowledge, attitude and practice on WASH. Although their knowledge is moderate, there is potential for them increase their knowledge through health promotion program at the school. Example of campaign that related to WASH such as *Program 7 Langkah Cuci Tangan* and *Perangi Aedes 'Tiada Aedes, Tiada Denggi'* (Ministry of Health, 2020). Health and hygiene promotion will be beneficial to conduct among students as their role of youth is very important nowadays because they are agents of change for today's society, especially in improving the status of public health (Flores, Goeke & Perez, 2014). Youth nowadays are more easily influenced by social media. This can be proved from the statistic of students that respond of getting information of WASH. 57.8% were obtained information about WASH on the Internet. Making a program in school is a little outdated and boring for today's youth. Therefore, health authorities as

well as public health NGOs need to play a role by using social media platforms to increase students' knowledge of

WASH. Also it is recommended for school to provide hand wash for eachhandwashing facilities for their students to practice personal hygiene at the school.

6.3 Limitation of Study

This current study has several limitations that need to be outlined. First, due to pandemics of COVID-19, researcher had to change method distribution of questionnaire physically to online form. This study analysis was only descriptions which lack to identify the factors affecting level of knowledge, attitude, and practice on WASH.

Second, in knowledge section, there were questions contained some recall information which lead to recall bias.

Fourth, the research was limited to only National secondary school students and aged 16 years old. Research was conducted only among school within the Petaling district. It is recommended to include all secondary students at all district in Selangor because they may have more broad findings about knowledge, attitude and practice on WASH in Malaysia.

6.4 Recommendation of Study

This study results was limited to youth who were in National secondary school within the Petaling district. Only 16 years old students were taken as sample in this study. Therefore, findings should not be used to

represent the entire population. It is recommended to increase sample size that can used to represent students from entire country. It is also recommended to conduct study among communities in both rural and urban area for comparison their KAP level on WASH.

CITED REFERENCES

Alexander, K. T., Dreibelbis, R., Freeman, M. C., Ojeny, B., & Rheingans, R. (2013). Improving service delivery of water, sanitation, and hygiene in primary schools: a cluster-randomized trial in western Kenya. *Journal ofWater and Health*, *11*(3), 507–519.

Bernama. (2020, 20th October). Selangor Sultan disappointed over water supply disruptions. *NST Online*.

Berhe, A. A., Aregay, A. D., Abreha, A. A., Aregay, A. B., Gebretsadik, A. W., Negash, D. Z., Gebreegziabher, E. G., Demoz, K. G., Fenta, K. A., & Mamo,
N. B. (2020). Knowledge, Attitude, and Practices on Water, Sanitation, and Hygiene among Rural Residents in Tigray Region, Northern Ethiopia. *Journal of Environmental and Public Health*, *2020*, 1–9.

CDC. (2019, November 7). Adolescence (15-17 years old). Retrieved June 24, 2021,from Centers for Disease Control and Prevention website: https://www.cdc.gov/ncbddd/childdevelopment/positiveparenting/adolescenc
e2.html#:~:text=Show%20more%20independence%20from%20parents,unsafe%20sex%2C%20and%20other%20problems.

Che Salleh, N., Mohamad Anuar, M. F., Abdullah, N. A., Yaw, S. L., Ibrahim Wong, N., Teck Pei, T., & Aris, T. (2019). Prevalence and Factors Associated With Oral and Hand Hygiene Practices Among Adolescents in Malaysia: Findings From the National Health and Morbidity Survey 2017. *Asia Pacific Journal of Public Health*, 101053951988099.

Chen, L., Hong, J., Xiong, D., Zhang, L., Li, Y., Huang, S., & Hua, F. (2020). Are parents' education levels associated with either their oral health knowledge or their children's oral health behaviors? A survey of 8446 families in Wuhan. *BMC Oral Health*, *20*(1).

En WL. & Gan GL. (2011). Factors associated with use of improved water sourcesand sanitation among rural primary schoolchildren in Pursat Province, Cambodia. *The Southeast Asian Journal of Tropical Medicine and Public Health*, *42*(4), 1022–1031.

Flores, G. R., Goeke, M. L., & Perez, R. (2014). The Power of Youth in ImprovingCommunity Conditions for Health. *NAM Perspectives*, *8*(9).

Gebreeyessus, G. D., & Adem, D. B. (2018). Knowledge, Attitude, and Practice on Hygiene and Morbidity Status among Tertiary Students: The Case of Kotebe Metropolitan University, Addis Ababa, Ethiopia. Journal of Environmental and Public Health, 2018, 1–9. doi:10.1155/2018/2094621

Goal 6: Clean water and sanitation. (n.d.). United Nation Development Programhttps://www.undp.org/content/undp/en/home/sustainable-development- goals/goal-6-clean-water-and-sanitation.html

Grimes, J. E. T., Tadesse, G., Gardiner, I. A., Yard, E., Wuletaw, Y., Templeton, M.R., … Drake, L. J. (2017). Sanitation, hookworm, anemia, stunting, and wasting in primary school children in southern Ethiopia: Baseline results froma study in 30 schools. *PLOS Neglected Tropical Diseases, 11*(10), e0005948.

Haliza A. R. (2014). Water Shortage in Malaysia: Again?. Malaysian Consumer LawJournal 1. 115-128.

Haaple, I. & Probart, C (2004). Food safety knowledge, perceptions and behavioramong middle school students. *JNutr Educ Behaviour*. 36, 71-6.

Hermes. (2020, November 12). Dengue cases seen rising into next year in worst-hit Selangor state. Retrieved June 24, 2021, from The Straits Times website: https://www.straitstimes.com/asia/se-asia/dengue-cases-seen-rising-into-next-year-in-worst-hit-selangor-state

Higuera, V. (2020, 27th April). *The 9 Dirtiest Spots in Your Home*. Healthline.https://www.healthline.com/health/germy-places#bathroom

Iudici, A. (2015). Health promotion in school: Theory, practice and clinical implications. Retrieved 29th June, 2021, from ResearchGate website: https://www.researchgate.net/publication/271552439_Health_promotion_in_school_Theory_practice_and_clinical_implications

Karon, A. J., Cronin, A. A., Cronk, R., & Hendrawan, R. (2017). Improving water,sanitation, and hygiene in schools in Indonesia: A cross-sectional assessment on sustaining infrastructural and behavioral interventions. International Journal of Hygiene and Environmental Health, 220(3), 539– 550.

Karkada, S. & Pai, M.S. (2016). Concept of health promoting school. Manipal J NursHealth Sci; 2,65-8

Krejcie, R.V., & Morgan, D.W., (1970). Determining Sample Size for Research Activities. Educational and Psychological Measurement.Small-Sample Techniques (1960). The NEA Research Bulletin, Vol. 38.

Manerikar, V. & Manerikar, S. (2015) "Cronbach's alpha," A Peer ReviewedResearch Journal - aWEshkar, 19 (1), 117-119.

Mbroh, L. (2019). Cornerstone: A Collection of Scholarly and Creative Works for Assessing Knowledge, Attitude and Practices of Hand Hygiene Among University Students.

Ministry of Education (Jan 2020). Statistics of Sekolah Menengah Kebangsaan Harian Retrieved November 20, 2020 https://www.moe.gov.my/en/education/secondary-school/sekolah-menengah-kebangsaan-harian

Mourad, K. A., Habumugisha, V., & Sule, B. F. (2019). Assessing Students' Knowledge on WASH-Related Diseases. International journal ofenvironmental research and public health, 16(11), 2052.

MyGOV - The Government of Malaysia's Official Portal. (2021). Retrieved June 24,2021, from Malaysia.gov.my website: https://www.malaysia.gov.my/portal/content/30114?language=my

O'Reilly, C. E., Freeman, M. C., Ravani, M., Migele, J., Mwaki, A., Ayalo, M., Ombeki, S., Hoekstra, R. M., & Quick, R. (2008) The impact of a school-based safe water and hygiene pro-gramme on knowledge and practices of students and their parents: Nyanza Province, western Kenya, 2006. Epidemiology and infection, 136(1), 80–91.

Prüss, A., Kay, D., Fewtrell, L., & Bartram, J. (2002). Estimating the Burden of Disease from Water, Sanitation, and Hygiene at a Global Level. Environmental Health Perspectives, 110(5), 537–542.

Prüss-Ustün, A., Kay, D., Fewtrell, L., & Bartram, J. (2004). Unsafe Water, Sanitation and Hygiene. Retrieved June 24, 2021, from ResearchGate website: https://www.researchgate.net/publication/253651949_Unsafe_Water_Sanitation_and_Hygiene

Prüss-Ustün, A., Bartram, J., Clasen, T., Colford, J. M., Cumming, O., Curtis, V., Bonjour, S., Dangour, A. D., De France, J., Fewtrell, L., Freeman, M. C., Gordon, B., Hunter, P. R., Johnston, R. B., Mathers, C., Mäusezahl, D., Medlicott, K., Neira, M., Stocks, M., Wolf, J., & Cairncross, S. (2014). Burden of disease from inadequate water, sanitation and hygiene in low and middle-income settings: a retrospective analysis of data from 145 countries. *Tropical Medicine & International Health*, *19*(8), 894–905.

Pourhoseingholi, M. A., Vahedi, M., & Rahimzadeh, M. (2013). Sample size calculation in medical studies. Gastroenterology and hepatology from bed tobench, 6(1), 14–17.

Rabbi, S. E., & Dey, N. C. (2013). Exploring the gap between hand washing knowledge and practices in Bangladesh: a cross-sectional comparativestudy. *BMC Public Health*, *13*(1).

Salahedeen Al-Haj (2018) Kap Surveys : How To Develop Knowledge, Attitude AndPractice Survey Accessed 30th November, 202 https://www.linkedin.com/pulse/kap-survey-how-develop-knowledgeattitude- practice-alhaj-

Salim, N. A. M., Wah, Y. B., Reeves, C., Smith, M., Yaacob, W. F. W., Mudin, R. N., & Haque, U. (2021). Prediction of dengue outbreak in Selangor Malaysia using machine learning techniques. *Scientific Reports*, *11*(1).

Saunders, M.N.K., Lewis, P., & Thornhill, A. (2012). Research methods for businessstudents (6th Ed.). Harlow, England: Pearson Education.

Sridhar, M. K. C., & Adejumo, M. (2020). Water, sanitation and hygiene (WASH) disease prevention and control in low re-source countries. Sustainable Water Engineering, 99–120.

Temitayo, I. O. (2016). Knowledge and Practices of Personal Hygiene among Senior Secondary School Students of Ambassadors College, Ile- Ife, Nigeria. *Texila International Journal Of Public Health*, *4*(4), 648–660.

Vivas, A. P., Gelaye, B., Aboset, N., Kumie, A., Berhane, Y., & Williams, M. A. (2010). Knowledge, attitudes and practices (KAP) of hygiene among school children in Angolela, Ethiopia. *Journal of preventive medicine and hygiene*, *51*(2), 73–79.

Walliman, N. (2017). *Research Methods: The Basics: 2nd edition* (2nd ed.). London,Routledge: Routledge.

Wills, W., Backett-Milburn, K., Gregory, S., & Lawton, J. (2006). Young teenagers'perceptions of their own and others' bodies: A qualitative study of obese, overweight and 'normal' weight young people in Scotland. *Social Science & Medicine*, *62*(2), 396–406. https://doi.org/10.1016/j.socscimed.2005.06.014

World Health Organization: WHO. (2018, 27th August). *Water, sanitation and hygiene (WASH)*. https://www.who.int/westernpacific/health-topics/water- sanitation-and-hygiene

World Health Organization: WHO. (2019, June 18). 1 in 3 people globally do not have access to safe drinking water – UNICEF, WHO. Retrieved June 24, 2021, from Who.int website: https://www.who.int/news/item/18-06-2019-1-in-3- people-globally-do-not-have-access-to-safe-drinking-water-unicef-who

Yaya, S., Hudani, A., Udenigwe, O., Shah, V., Ekholuenetale, M., & Bishwajit, G. (2018). Improving Water, Sanitation and Hygiene Practices, and Housing Quality to Prevent Diarrhea among Under-Five Children in Nigeria. *Tropical Medicine and Infectious Disease*, *3*(2), 41.

Zhu, X., & Xie, X. (2015). Effects of Knowledge on Attitude Formation and

Change Toward Genetically Modified Foods. *Risk Analysis*, *35*(5), 790–810.

Zolkepli, F. (2019, 15th October). Water disruption: Pipe leak causes water shortage at KL's Petaling district. The Star.

APPENDICES

Appendix A

Questionnaire & Informed Consent Form

[ENGLISH VERSION]

QUESTIONNAIRE OF KNOWLEDGE, ATTITUDE AND PRACTICE ON WATER, SANITATION AND HYGIENE (WASH)

PART 1: Sociodemographic Characteristics and General Information

Gender: ☐ Male ☐ Female

Race: ☐ Malay ☐ Chinese ☐ Indian

☐ Other (*please specify*):…….

Mother's education level:

Education level	Tick (/)
Primary level (UPSR)	
Secondary level (PMR/PT3/SPM)	
Matriculation/Foundation	
Tertiary level (Degree,Master,PhD)	
Other (please specify)	

Father's education level:

Education level	Tick (/)
Primary level (UPSR)	
Secondary level (PMR/PT3/SPM)	
Pre-University level (Matriculation/Foundation/Diploma)	

Tertiary level (Degree,Master,PhD)	
Other (please specify)	

What is the main source of drinking water used at home?

☐ Filtered/ Treated tap water (Eg: Coway, Cuckoo, Espring, Kangen or any water filter system)

☐ Mineral bottled water (Eg: Spritzer, Cactus, Evian, SeaMaster)

☐ Other (please specify):……

What is your water consumption quantity per day?

☐ 2-5 litres per day

☐ >5 litres per day

PART 2: Knowledge on Water, Sanitation and Hygiene (WASH)

Please tick (/) for your answer:

No.	Question	Yes	No
1.	Have you got information on WASH in the last 6 months?		
4.	In your opinion, usage of unsafe water will cause diarrhea?		
5.	Do animal faeces cause diseases?		
6.	In your opinion, is the toilet essential and obligatory for every household?		
7.	In your opinion, does water can get contaminated?		
8.	Do you use a clean water source for hand washing?		

2. Where did you get the source of information about Water, Sanitation and Hygiene (WASH)?

Please tick (/) any of following (can be more than 1 option)

- ☐ Internet
- ☐ Radio/Television
- ☐ Newspaper/Magazine
- ☐ School
- ☐ Health program community (in the last 6 months)
- ☐ Do not know

3. What information(s) is obtained about Water, Sanitation and Hygiene (WASH)? (can be more than 1 option)

- ☐ Water quality
- ☐ Toilet
- ☐ Sanitation
- ☐ Other (please specify):……

9. What are the consequences of using contaminated water?

- ☐ Expose to diseases
- ☐ Does not expose to diseases
- ☐ Do not know

10. What are the consequences of not washing hands?

- ☐ Expose to various diseases
- ☐ Does not expose to diseases
- ☐ Do not know

11. To your knowledge, what are diseases that related to Water, Sanitation and Hygiene (WASH): (can be more than 1 option)

☐ Cholera	☐ Diarrhea	☐ Dysentery
☐ Typhoid	☐ Malaria	☐ Dengue

☐ Other:_____

PART 3: Attitude on Water, Sanitation and Hygiene (WASH)

Attitude on access, quality, and use of water

Please tick (/) for your answer:

No.	Characteristics	Strongly disagree	Disagree	Not sure	Agree	Strongly agree
12.	Clean water consumption is important when one sick and healthy					
13.	Safe and adequate use of water can prevent exposure to waterborne diseases such as typhoid, diarrhea and cholera.					
14.	Defecating near water source can cause contamination					
15	Boiling water before consumption helps to remove disease causing microorganisms					
16.	Water containers must always be clean					

Attitude on sanitation and health promotion

Please tick (/) for your answer:

No.	Characteristics	Strongly agree	Agree	Not sure	Disagree	Strongly disagree
17.	Diarrheal diseases are caused by poor personal hygiene.					
18.	Diarrheal diseases are transmittable					
19.	Poorly managed liquid or solid waste can be breeding sites for flies and rodents					
20.	Animal faeces if not properly managed will causes health problems					

Attitude on hand hygiene

Please tick (/) for your answer:

No.	Characteristics	Strongly agree	Agree	Not sure	Disagree	Strongly disagree
21.	Washing hand after using toilet prevents diarrheal diseases					
22.	Washing hands with water alone is enough to sanitize hands					
23	Washing hands is more important before and after eating					
24	Hand hygiene and diarrheal diseases are unrelated					

PART 4: Practice on Water, Sanitation and Hygiene (WASH)

Please tick (/) for your answer:

25. Do you wash your hand after using toilet/washroom?

- ☐ Yes
- ☐ No

26. Are both soap and water available at the handwashing facilities in the home?

- ☐ Yes, water and soap
- ☐ Water only
- ☐ No water or soap

27.. Usual material used for hand washing at school

- ☐ Water only
- ☐ Water and soap

28.. Usual material used for hand washing at home

- ☐ Water only
- ☐ Water and soap

29.. Do you clip your hand nails regularly? (at least twice in a month)

- ☐ Yes
- ☐ No

30. Overall, do you practice on personal hygiene at school and home?

- ☐ Good
- ☐ Poor
- ☐ Do not know

JAWATANKUASA ETIKA UNIVERSITI UNTUK PENYELIDIKAN MELIBATKAN MANUSIA (JKEUPM)
UNIVERSITI PUTRA MALAYSIA, 43400 UPM SERDANG, SELANGOR, MALAYSIA

FORM 2.4: RESPONDENT'S INFORMATION SHEET AND INFORMED CONSENT FORM

Please read the following information carefully and do not hesitate to discuss any questions you may have with the researcher.

1. STUDY TITLE:

Assessment of Knowledge, Attitude And Practice (KAP) Towards Water, Sanitation and Hygiene (WASH) among Secondary School Students in Petaling district.

2. INTRODUCTION:

You are invited to take part voluntarily in a research.

This research will access the level of knowledge, attitude and practice (KAP) towards water, sanitation and hygiene (WASH) among secondary school student in Petaling District. This study focuses on WASH and purposely to deepen the understanding of commonly known information, attitudes, and factors that influence behavior. Water-related diseases might be occured due to inadequate WASH.

This survey will take about ten (10) minutes of your time to be completed. We thank you in advance for your kind participation in this survey.

3. WHAT WILL YOU HAVE TO DO?

If you agree to involve in this research, you are required to fill in the consent form before answering a set of questions. When you complete the survey, please click submit on the online form. ***As a reminder, you may leave this research if you feel uncomfortable with some of questions.***

4. WHO SHOULD NOT PARTICIPATE IN THE STUDY?

This study include participants who are from Petaling Perdana and Petaling Utama secondary schools, specifically for Sekolah Menengah Kebangsaan and 16 years old only. If you are not classified in this criteria, you are excluded from this study.

5. WHAT WILL BE THE BENEFITS OF THE STUDY:

(a) TO YOU AS THE SUBJECT?

You will not gain any direct benefit from this research study but your participation will be a great help to assist our study in assessing knowledge, attitude and practice (KAP) towards water, sanitation and hygiene (WASH) among secondary school student in Petaling District.

(b) TO THE INVESTIGATOR?

From this study, researchers will know the level of knowledge, attitude and practice (KAP) towards water, sanitation and hygiene (WASH) among secondary school student in Petaling District.

6. WHAT ARE THE POSSIBLE RISKS?

There is risk that you may be uncomfortable answering some of the questions. You do not have to answer any of the questions if you feel the question(s) make(s) you uncomfortable.

7. WILL THE INFORMATION THAT YOU PROVIDE AND YOUR IDENTITY REMAIN CONFIDENTIAL?

Your personal information and data that will be obtained from the questionnaire is confidential and will not be included in any of the report or publication. The information that will be collected from this research will be kept as private and will not be shared to anyone outside of the research team. Any information will not identified either by your name.

8. WHO SHOULD YOU CONTACT IF YOU HAVE ADDITIONAL QUESTIONS DURING THE COURSE OF THE RESEARCH?

If you have any question about this study or your rights, please contact:

1. Miss Wani Azizah binti Abdul Hadi Kamal (Researcher)

   H/P: 013-3929764

   Email: waniazizah11@gmail.com

2. Dr. Shaharuddin bin Mohd Sham (Supervisor)

   H/P: 012 – 3387305

   Email: shaha@upm.edu.my

   Department of Environmental and Occupational Health

   Faculty of Medicine & Health Sciences

   Universiti Putra Malaysia

*Please initial here if you have read and understood the contents of this page*_____

9. CONSENT

I …… Identity Card No. …… address…… …….. ……..hereby voluntarily agree to take part in the research stated above *(clinical /drug trial/video recording/ focus group/interview-based/ questionnaire-based).

I have been informed about the nature of the research in terms of methodology, possible adverse
effects and complications (as written in the Respondent's Information Sheet). I understand that I have the right to withdraw from this research at any time without giving any reason whatsoever. I also understand that this study is confidential and all information provided with regard to my identity will remain private and confidential.

I* wish / do not wish to know the results related to my participation in the research

I agree/do not agree that the images/photos/video recordings/voice recordings related to me be used in any form of publication or presentation (if applicable)

* delete where necessary

Signature ……..…… (Respondent)

Date :……..

Signature ……..…… (Witness)

Name :……..…..

I/C No. :……..…..

I confirm that I have explained to the respondent the nature and purpose of the above-mentioned research.

Date ……..……

Signature ……..…….
(Researcher)

Appendix B

Krejcie and Morgan Table (1970)

TABLE 1
Table for Determining Sample Size from a Given Population

N	*S*	*N*	*S*	*N*	*S*
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	1000000	384

Note.—*N* is population size.
S is sample size.

ETHICS COMMITTEE FOR RESEARCH INVOLVING HUMAN SUBJECTS (JKEUPM)
UNIVERSITI PUTRA MALAYSIA

Research title	:	**Assessment of Knowledge, Attitude and Practice (KAP) Towards Water, Sanitation and Hygiene (WASH) among Secondary School Students in Petaling District.**
Study Site	:	**Secondary School Students in Petaling District**
JKEUPM Ref No.	:	**JKEUPM-2021-022**
Researcher	:	**Wani Azizah Abdul Hadi Kamal**
Supervisor	:	**Dr. Shaharuddin Mohd Sham**

Documents received and reviewed with reference to the above study:

1. Ethics Application Form, Version 1 dated 11/1/2021
2. Respondent Information Sheet & Consent (English), Version 2 dated 8/3/2021
3. Respondent Information Sheet & Consent (Malay), Version 2 dated 8/3/2021
4. Respondent Information Sheet & Guardian's/Parent's Consent (English), Version 1 dated 11/1/2021
5. Respondent Information Sheet & Guardian's/Parent's Consent (Malay), Version 1 dated 11/1/2021
6. Proposal (English), Version 1 dated 11/1/2021
7. Questionnaire/Interview (English), Version 1 dated 11/1/2021
8. Questionnaire/Interview (Malay), Version 1 dated 11/1/2021
9. Curriculum Vitae of:
    a. Dr. Shaharuddin Mohd Sham

The University Research Ethics Committee, Universiti Putra Malaysia (JKEUPM) operates in accordance to the ICH-GCP Guidelines.
Decision by JKEUPM:

[X] Approved

[X] **Permission MUST BE OBTAINED from the respective hospitals/ institutions before conducting the research**

[ ] Disapproved

Please note that the approval is **VALID UNTIL 17 MARCH 2022**

Researchers should comply with the following:

I. Complete a Study Final Report upon study completion (Form 3.2).

II. Ethical approval is required in the case of amendments/ changes to the study documents/ study sites/ study team.

III. Applicable for Clinical Trial Studies and Clinical interventional Studies only: Progress Report has to be submitted to JKEUPM at every 6 months from the date of approval (Form 3.1). Report