KEMENTERIAN KESIHATAN MALAYSIA

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NATIONAL HEALTH & MORBIDITY SURVEY 2022

ADOLESCENT HEALTH SURVEY 2022

SABAH

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LIST OF ABBREVIATIONS

AHS	Adolescent Health Survey
BOD	Burden of Disease
CDC	Centers for Disease Control and Prevention
GSHS	Global School-based Student Health survey
IPH	Institute for Public Health
NMRR	National Medical Research Register
UNICEF	United Nations Children's Fund
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNODC	United Nation Office on Drug and Crime
WHO	World Health Organization

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EXECUTIVE SUMMARY

The Adolescent Health Survey (AHS) 2022 was conducted from June to July 2022 with the aim of determining the prevalence of health risk behaviours and protective factors among adolescents in Malaysia. This nationwide cross-sectional survey used a two-stage stratified sampling design and a validated self-administered questionnaire. Out of 2798 secondary schools under the Ministry of Education (MOE) and the Ministry of Rural and Regional Development (MARA), 240 schools were randomly selected and a total of 37,479 students were eligible to participate in the survey. The findings showed that a total of 239 schools with 33,523 adolescents were involved in this study, resulting in an overall response rate of 89.0%. In Sabah, 16 secondary schools were randomly selected, and out of 2342 eligible students, 2086 students completed the survey, yielding a response rate of 89.1%.

Sabah Key Findings

The study revealed that the prevalence of current use of any tobacco products, current tobacco smokers, current cigarette smokers and current e-cig/vape users among adolescents in Sabah was 23.0%, 12.2%, 8.6% and 19.0% respectively. The prevalence of current alcohol drinkers among adolescents was 9%. While the prevalence of ever-alcohol drinkers among adolescents in Sabah was 22.2%, 61.6% of them had their first alcoholic beverage before the age of 14 years. The prevalence of ever having sex and had sex in the past 30 days among adolescents was 6.8% and 4.9%, respectively. Of those who ever had sex, 30.8% had their first sexual experience before age 14, and 11.9% had at least two sexual partners. Only 5.9% of respondents or their partners had used condoms, while 12.9% used other birth control methods. A total of 22% of adolescents had been seriously injured in the past 12 months, with the two most common causes of injury being falls and motor vehicle accidents. Among respondents, 16.6% claimed to have been physically attacked in the past 12 months, while 19.3% of adolescents claimed to have been involved in physical fights. With regards to bullying, 9.9% reported having been bullied in the past 30 days. A total of 19.2% of adolescents in Sabah reported feeling lonely, and 14.9% reported being unable to sleep "most of the time or always" due to worry in the 12 months prior to the survey. Prevalence of suicidal ideation, plan and attempt were 14.5%, 10.5%, and 10.5%, respectively. Overall, 29.7% of adolescents reported being depressed. The prevalence of truancy among adolescents in the past 30 days was 33.3%, and only 46.8% claimed to have peer support. Adolescents who reported having parental or guardian supervision, parental or guardian connectedness and parental or guardian bonding were 11.2%, 24.3% and 31.5%, respectively. Overall, 83.8% of adolescents reported brushing their teeth twice a day in the past 30 days. A total of 47.3% of adolescents reported not knowing whether their toothpaste contained fluoride while only 23.4% used dental floss. In the past 30 days, 67.2% always used soap when washing their hands, 84.7% always washed their hands before eating, and 86.6% reported that they always washed their hands after using the toilet. In relation to dietary behaviours, 2.7% reported being hungry most of the time or always in the past 30 days because there was not enough food at home. The consumption of fruits at least twice daily was 40.0% and vegetables at least thrice daily was 32.1% in the past 30 days. Consumption of carbonated drinks at least once daily in the past 30 days was reported at 42.8%, while 12.8% consumed food from fast food restaurants for at least three days in the past seven days. The prevalence of stunting and thinness among adolescents was 10.7% and 7.7%, respectively, while the prevalence of overweight was 14.3% and obesity was 10.8%. Prevalence of being physically active was 19.6% and 27.8% of adolescents reported active transportation to school. In addition, 59.1% of adolescents had spent at least three hours on a typical or usual day in sitting activities. Overall, 4.8% reported had ever used drug and the prevalence of current drug users was 3.2% while 1.5% reported had current used kratom.

Malaysia Key Findings

The study revealed that the prevalence of current use of any tobacco products, current tobacco smokers, current cigarette smokers and current e-cig/vape users among adolescents in Malaysia was 18.5%, 9.0%, 6.2% and 14.9% respectively. Among those who smoked cigarettes and among those who used e-cig/vape, 65.7% had initiated cigarette smoking, and 48.5% had initiated e-cig/vape use, respectively, before the age of 14 years. The prevalence of current alcohol drinkers among adolescents was 7.4%. While the prevalence of ever-alcohol drinkers among adolescents in Malaysia was 18.6%, 64.6% of them had their first alcoholic beverage before the age of 14 years.

The prevalence of ever having sex and had sex in the past 30 days among adolescents was 7.6% and 5.7%, respectively. Of those who ever had sex, 32.8% had their first sexual experience before age 14, and 10.7% had at least two sexual partners. Only 11.8% of respondents or their partners had used condoms, while 11.9% used other birth control methods. A total of 20.4% of adolescents had been seriously injured in the past 12 months, with the two most common causes of injury being falls and motor vehicle accidents. Among respondents, 14.8% claimed to have been physically attacked in the past 12 months, while 16.0% of adolescents claimed to have been involved in physical fights. With regards to bullying, 8.6% reported having been bullied in the past 30 days.

A total of 16.2% of adolescents in Malaysia reported

feeling lonely, and 4.2% said that they had no close friends. A total of 12.9% reported being unable to sleep "most of the time or always" due to worry in the 12 months prior to the survey. Prevalence of suicidal ideation, plan and attempt were 13.1%, 10.0%, and 9.5%, respectively. Overall, 26.9% of adolescents reported being depressed. The prevalence of truancy among adolescents in the past 30 days was 25.6%, and only 46.0% claimed to have peer support. Adolescents who reported having parental or guardian supervision, parental or guardian connectedness and parental or guardian bonding were 9.9%, 24.2% and 33.4%, respectively. Overall, 82.2% of adolescents reported brushing their teeth twice a day in the past 30 days. A total of 43.3% of adolescents reported not knowing whether their toothpaste contained fluoride while only 21.4% used dental floss. In the past 30 days, 69.3% always used soap when washing their hands, 84.5% always washed their hands before eating, and 86.5% reported that they always washed their hands after using the toilet.

In relation to dietary behaviours, 2.5% reported being hungry most of the time or always in the past 30 days because there was not enough food at home. The consumption of fruits at least twice daily was 37.3% and vegetables at least thrice daily was 27.1% in the past 30 days. Consumption of carbonated drinks at least once daily in the past 30 days was reported at 32.4%, while 10.6% consumed food from fast food restaurants for at least three days in the past seven days. The prevalence of stunting and thinness among adolescents was 6.8% and 8.3%, respectively, while the prevalence of overweight was 16.2% and obesity was 14.3%. Prevalence of being physically active for a total of at least 60 minutes daily for five days or more in the past seven days was 21.4% and 27.0% of adolescents reported active transportation to school. In addition, 66.7% of adolescents had spent at least three hours on a typical or usual day in sitting activities.

Recommendations:

In view of the above findings, the following recommendations are suggested:

- Strengthening the multi-approach school-based nutrition and physical activity intervention to motivate behaviour modification for improving healthy eating and lifestyle amongst adolescents.
- Improving the national school curriculum that teaches life skills such as effective coping strategies as part of "Program Minda Sihat".
- A more comprehensive sexual and reproductive health education programmes should be planned and executed among adolescents.
- Strengthening the current law and taking legal action in controlling the accessibility of tobacco products.

1.0 INTRODUCTION

Adolescence is a life phase in which the opportunities for health are great and future patterns of adult health are established; it is a critical stage in life with significant physical, emotional, cognitive, and social development and other disruptions in their communities.[1] As much as one-third of the global Burden of Disease (BOD) is attributable to adolescent behavioural choices and events.[2] In order to improve adolescent health globally, the World Health Organization (WHO) has initiated the development of the health risk behaviours measurement tools known as the Global School-based Student Health Survey (GSHS).[3] More than 140 countries have used the GSHS to periodically monitor the prevalence of important health risk behaviours and protective factors among adolescents.[4] In Malaysia, adolescents comprise approximately 15.6% of the total Malaysian population, and the national data on health risks and behaviours are fundamental in developing policies and programmes for adolescents. Thus, the Ministry of Health, Malaysia took a step forward in collaborating with the WHO to conduct the first GSHS Malaysia in 2012 among adolescents aged 13 to 17 years, which aimed to determine the baseline of the health status of adolescents in Malaysia.[5] In 2017, the second adolescent health study (AHS) using the GSHS methods and questionnaire was conducted in the country.[6] These surveys revealed an increasing trend of health risk behaviours among adolescents in Malaysia.[5,6] With the increasing trend of non-communicable disease risk factors and other behaviour-related risks, it is timely for the survey to be repeated in 2022 to further monitor the health status of adolescents in the country. The Ministry of Health conducted this third national survey on adolescents with the co-operation from the Ministry of Education to determine the prevalence of health risk behaviours and protective factors among adolescents in Malaysia.

1.1 Objectives

1.1.1 General Objectives

To determine the prevalence of health risk behaviours and protective factors among adolescents in Malaysia.

1.1.2 Specific Objectives

To determine the prevalence of:

i. Alcohol use
ii. Dietary behaviours
iii. Drug use
iv. Hygiene (including oral health)
v. Mental health problems
vi. Physical activity
vii. Protective factors
viii. Sexual behaviours
ix. Tobacco use
x. Violence and unintentional injury
xi. Adolescents' perspectives on the impact of the COVID-19 pandemic on their families

2.0 METHODOLOGY

2.1 Study Design

The National School-Based Student Health Survey 2022 was a nationwide cross-sectional study of secondary school adolescents in Malaysia.

2.2 Sampling Frame and Target Population

The sampling frame comprised national secondary schools registered in 2021, which include government schools and private schools under the purview of the Ministry of Education (MOE) and the Ministry of Rural and Regional Development (MARA). According to the frame, there were 2798 secondary schools in Malaysia **(Table 2.1)**. An equal proportion was sampled from 13 States and three Federal Territories to represent adolescents in each State / Federal Territories. The target population was secondary school adolescents aged between 13 to 17 years studying in form 1 until form 5 based on the local school categorization.

2.3 Sample Size Calculation

The sample size was calculated based on the objectives of each module using the sample size calculation formula for a single proportion. The sample size calculation was based on a few criteria, as stated below:

$$n_0 = \frac{z_{\alpha/2}\, p(1-p)}{e^2}$$

Where:

i. Variance of proportion of the variable of interest (Based on AHS 2017 survey)
ii. Margin of error (e) (Between 0.01 to 0.05)
iii. Confidence interval of 95%

To ensure optimum sample size to estimate the prevalence of the health conditions specified in the survey with acceptable precision, a few adjustments were made to the sample size calculation as follows:

i. design effect (deff) of 2,
ii. nonresponse rates of 20%, and
iii. The sample size was then adjusted according to the need of the analysis, whether the estimates were going to be done at the national or the state level.

Thus, the final sample sizes for adolescents at national and state levels were 36,000 and 2250, respectively **(Table 2.1)**

Table 2.1: Distribution of secondary schools sampled, by state

No.	State / Federal Territories	Total Number of Schools	Number of Schools Sampled	Number of adolescents sampled
1	Johor	328	16	2250
2	Kedah	219	16	2250
3	Kelantan	189	16	2250
4	Melaka	88	16	2250
5	N. Sembilan	142	16	2250
6	Pahang	211	16	2250
7	Pulau Pinang	148	16	2250
8	Perak	276	16	2250
9	Perlis	33	16	2250
10	Selangor	380	16	2250
11	Terengganu	166	16	2250
12	Sabah	245	16	2250
13	Sarawak	214	16	2250
14	WP Kuala Lumpur	135	16	2250
15	WP Labuan	12	8	2250
16	WP Putrajaya	12	8	2250
	Total	2798	240	36000

2.4 Sampling Design

The country was stratified according to the 16 states, including federal territories, for the sampling. A multistage stratified cluster sampling method was used, and it involved two stages. The first stage was the selection of secondary schools from all eligible schools in Malaysia. Subsequently, the 240 schools were selected randomly with probability proportional to enrolment (PPS) in forms 1, 2, 3, 4, and 5. In each state, 16 secondary schools were selected, except for 2 smaller federal territories (Labuan, Putrajaya - 8 schools each) **(Table 2.1)**. The second stage involved the selection of classes (secondary sampling units). All classes in forms 1, 2, 3, 4, and 5 were included in the sampling frame. Systematic probability sampling with a random start was used to select classes from each selected school. All adolescents in the selected classes were invited to involve in the survey.

2.5 Ethical Approval and Consent Forms

Ethical approval was obtained from the Medical and Research Ethics Committee (MREC), Ministry of Health, Malaysian (NMRR-21-157-58261). The permission to conduct the study was obtained from the Ministry of Education at the national, state and school levels. Only consented adolescents with consented parents were included in the study. Their participation in the study was voluntary.

2.6 Study Instrument

A validated self-administered questionnaire was used for data collection in NHMS 2022. The questionnaires were translated into the Malay, Chinese and Tamil languages and back-translated to English to ensure the quality of the translation. The questionnaires were then field-tested, revised, finalised, and approved by the NHMS 2022 Questionnaire Review Committee. The questionnaire consisted of 10 core modules and 1 additional module, which included the following topics:

- Alcohol use
- Dietary behaviours
- Drug use
- Hygiene (including oral health)
- Mental health problems
- Physical activity
- Protective factors
- Sexual behaviours
- Tobacco use
- Violence and unintentional injury
- Adolescents' perspectives on the impact of the COVID-19 pandemic on their families

2.7 Data Collection

This cross-sectional survey was conducted from June to July 2022 among adolescents in forms 1, 2, 3, 4, and 5 across Malaysia by 34 data collection teams: two teams for each state in Peninsular Malaysia, including Labuan and three teams for Sabah and Sarawak. Each state was assigned a field supervisor to oversee survey activities. A one-week training workshop was conducted for the field supervisor and 133 temporary data collectors before data collection. After completing the training, the assigned field supervisor and data collection teams travelled to their respective sites to conduct the survey at the selected schools. The adolescents answered the questionnaires on the optical mark recognition (OMR) answer sheet. The team leader verified the OMR sheets before posting them to Institute for Public Health (IPH).

2.8 Quality Control

Quality control of the whole survey was done at various stages. During the planning stage, quality was ensured through a robust survey design, validated questionnaires and tools, manuals, and standardised training. In the field, the team leader and field supervisor checked the quality of the data collected. At the same time, members of the Central Coordinating Team (CCT) at IPH monitored data collection progress and conducted data quality control on a weekly basis. Figure 1 detailed the organization chart at Institute for Public Health level.

2.9 Data Processing and Quality Centre

All data processing and quality activities were centralised at IPH, starting from receiving the OMR bundles from the field until the handover of the dataset to the data analysis team. Four stations were set up at this Centre to ensure the activity ran smoothly (**Figure 2)**.

2.10 Data Analysis

SPSS version 26.0 was used for data analysis. The data was examined for quality control and cleaned for any inconsistencies. Analysis was done according to objectives, working definition and dummy tables prepared by each research team. A complex sample analysis procedure was performed with a 95% confidence interval. Prevalence and percentages were used to illustrate the findings of each scope.

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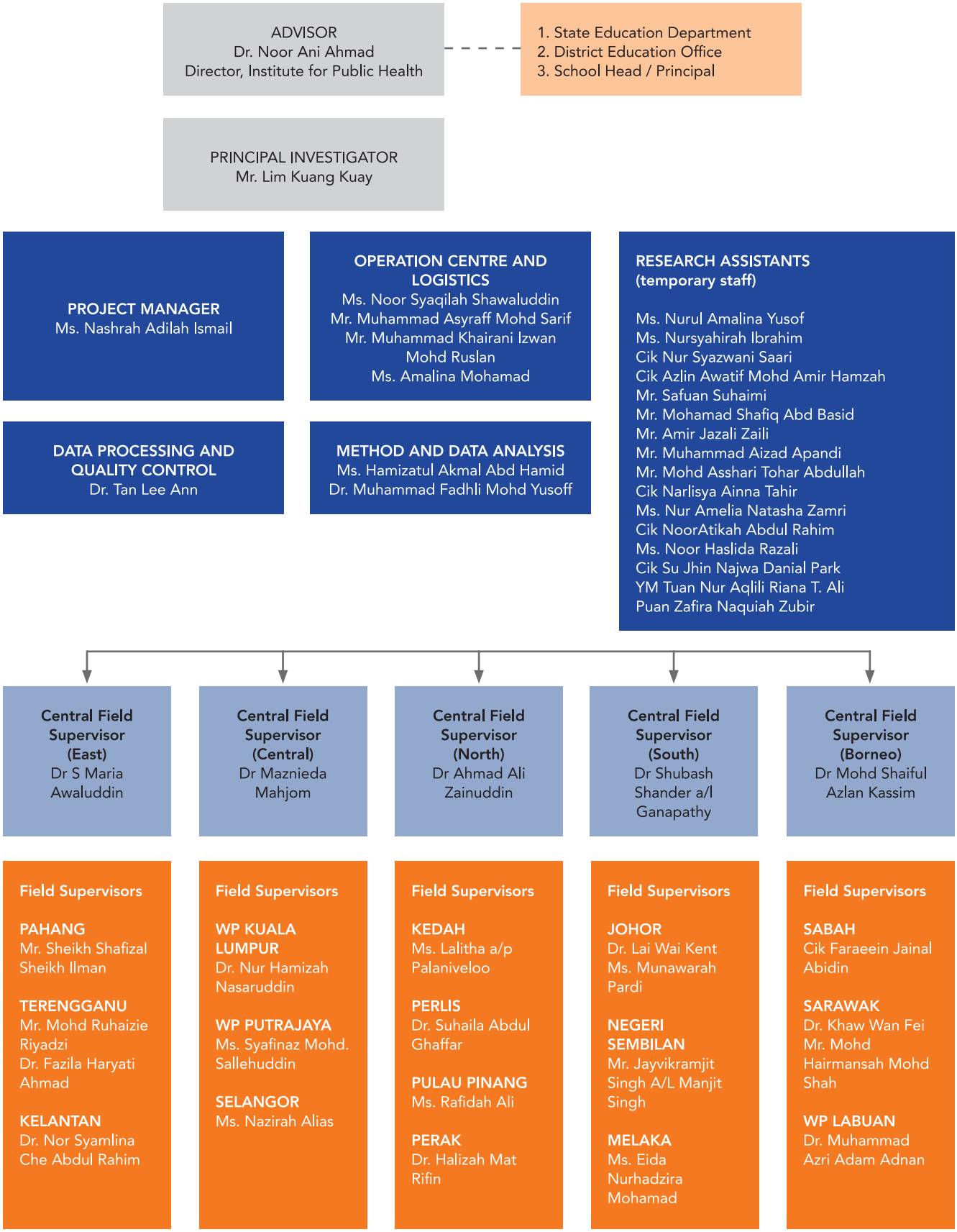

Figure 1: Organisation chart for data collection team NHMS 2022

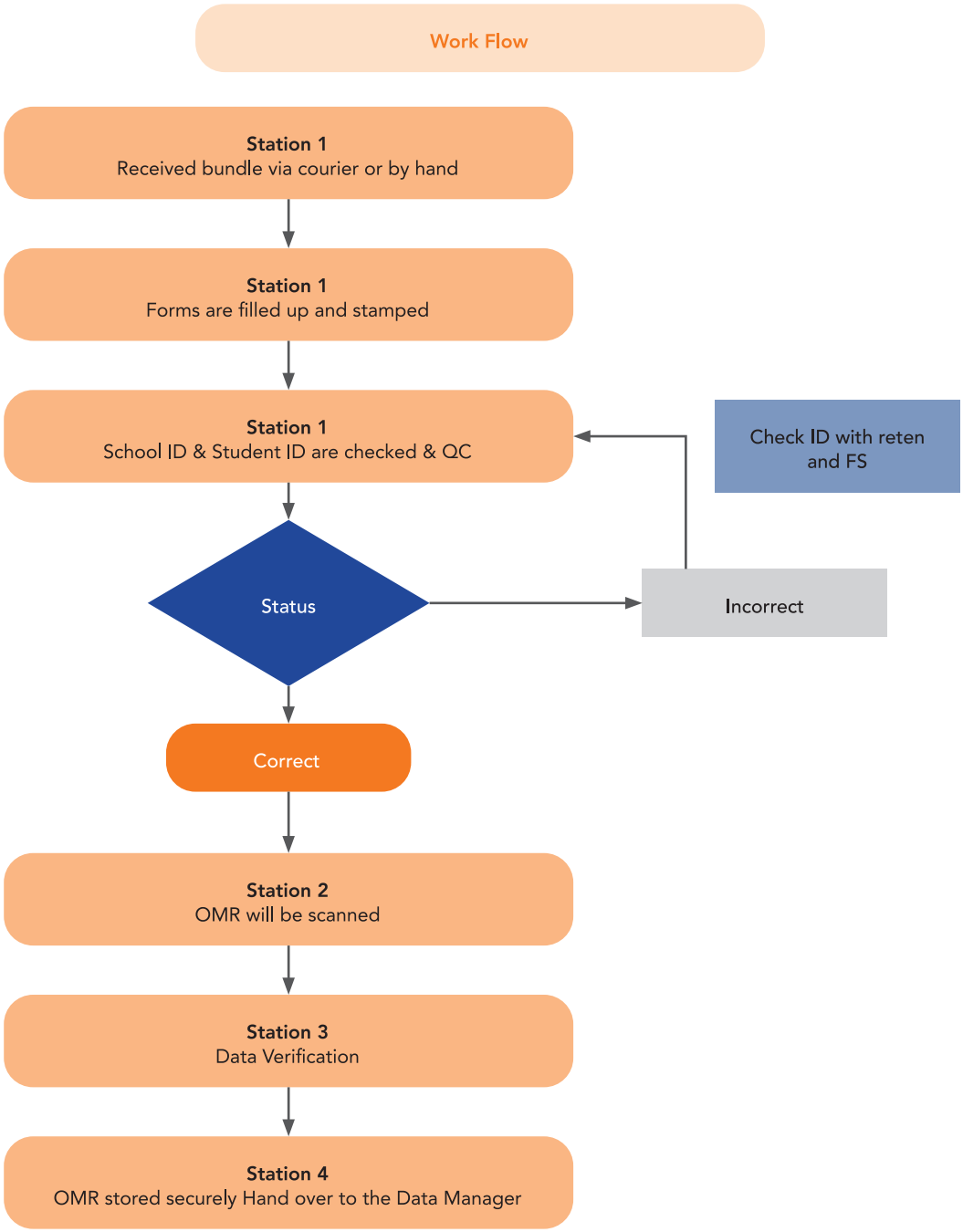

Figure 2: Workflow of Data Processing NHMS 2022

3.0 FINDINGS

3.1 General Findings

Overall, 239 out of 240 schools participated in the survey, resulting in a 99.6% school response rate. The response rate for classes was 100% and the student's response rate was 89.4% (n=33,523). Thus, the overall response rate was 89.0%. Based on the state, the highest number of adolescents who participated in the survey were from Sabah (95.9%), and the lowest was WP Putrajaya (83.4%) **(Table 3.1.1)**. The geographic information system (GIS) on the mapping of selected secondary schools is shown in **Figure 3.**

Table 3.1.1: Response rate at student level, by state, 2022

State	Selected Schools	Eligible Adolescents	Completed OMR forms	Response Rate (%)
Johor	16	2336	2005	85.83
Kedah	16	2312	2172	93.94
Kelantan	16	2368	2138	90.29
Melaka	16	2373	1986	83.69
N. Sembilan	16	2422	2210	91.25
Pahang	16	2382	2171	91.14
Pulau Pinang	16	2300	2044	88.87
Perak	16	2384	2126	89.18
Perlis	16	2160	2004	92.78
Selangor	16	2366	2048	86.56
Terengganu	16	2314	2219	95.89
Sabah	16	2342	2086	89.07
Sarawak	16	2442	2189	89.64
WP Kuala Lumpur	16	2338	2114	90.42
WP Labuan	8	2267	2033	89.68
WP Putrajaya	8	2373	1978	83.35
Total	**240**	**37479**	**33523**	**89.44**

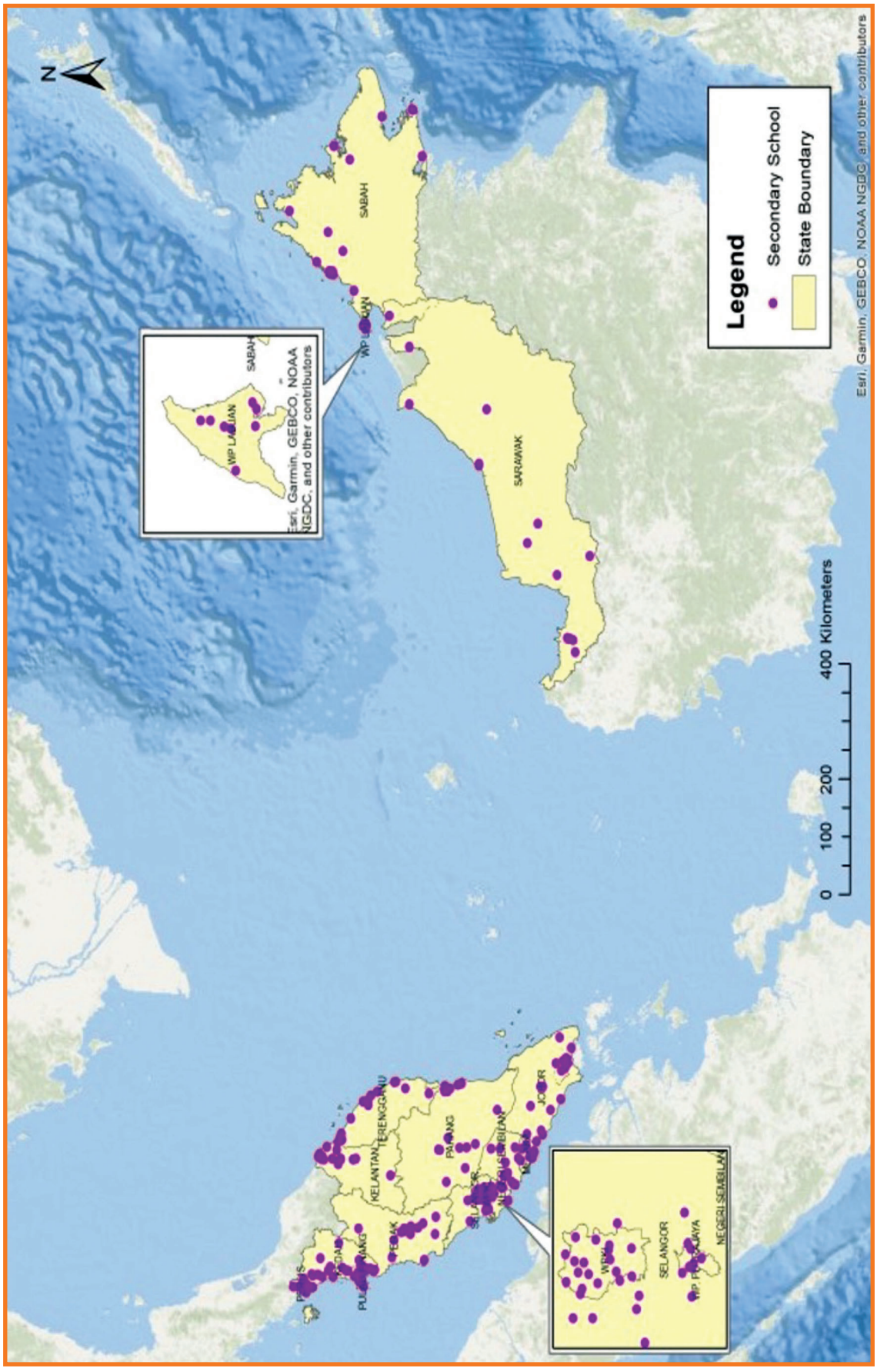

Figure 3: GIS mapping of the selected secondary schools

3.2 Alcohol Consumption

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3.2.1 Introduction

Annually, the harmful use of alcohol results in approximately 3 million deaths worldwide[1]. Alcohol is responsible for 5.1% of the global burden of disease and injury, as measured by disability-adjusted life years (DALYs)[1]. It is the main cause of premature death and disability in individuals aged 15 to 49, accounting for 10% of all deaths in this age group[2].

3.2.2 Objectives

i. To determine the prevalence of ever and current drinkers among adolescents
ii. To describe the socio-demographic characteristics of ever and current drinkers among adolescents
iii. To identify the age of alcohol drinking initiation among adolescents
iv. To identify the sources of obtaining alcoholic beverages among adolescents
v. To identify the prevalence of drunkenness among adolescents who consume alcohol
vi. To determine the frequency of social problems related to alcohol consumption among adolescents

3.2.3 Variable definitions

- **Drinking alcohol**: A "drink" is a glass of wine, tuak, lihing, bahar, ijuk or toddy; a can of beer, a small glass of liquor' or mixed drink. Drinking alcohol does not include drinking a few sips of wine for religious purposes.
- **Ever drinkers**: Those who had a history of alcohol consumption in their lifetime.
- **Current drinkers**: Those who had at least a "drink" of alcohol in the past 30 days.
- **Drunkenness**: When someone demonstrates signs such as staggering when walking, not being able to speak right and throwing up after consuming alcohol in a lifetime.
- **Social problems**: Having trouble with family or friends, missed school or got into fights as a result of drinking alcohol in a lifetime.

3.2.4 Findings

Ever Alcohol Drinkers
The prevalence of ever alcohol drinkers among adolescents in Sabah was 22.2% (95% CI: 14.85, 31.84). Males had a higher prevalence at 23.5% (95% CI: 15.86, 33.29) compared to females of 21% (95% CI: 12.79, 32.45). **(Table 3.2.1)**

Current Alcohol Drinkers
The prevalence of current alcohol drinkers among adolescents in Sabah was 9.0% (95% CI: 5.52, 14.43) where males had a higher prevalence of 10.1% (95% CI: 6.09, 16.23) compared to females at 8.0% (95% CI: 4.37, 14.25). **(Table 3.2.2)**

Initiation of First Alcohol Use Before 14 years old
Among ever alcohol drinkers, 61.6% had their first alcoholic beverage before the age of 14 years. **(Table 3.2.3)**

Sources of Obtaining Alcoholic Beverages Among Current Alcohol Drinkers
Among current alcohol drinkers, 53.6% of adolescents obtained their alcoholic beverages from their family, followed by 17.0% got it from a friend. **(Table 3.2.4)**

Social Problems as a Result of Alcohol Drinking
Overall, the majority (79.3%) of the adolescents did not get into trouble with family or friends, missed school or got into a fight as a result of drinking alcohol among ever alcohol drinkers. **(Table 3.2.5)**

Parental and peer drinking
Parental drinking among current alcohol drinkers in Perak was reported as 72.4%, while peer drinking was 88.9%.

Drunkenness
Among ever alcohol drinkers, only 32.1% reported drunkenness.

3.2.5 Discussion / Conclusion

According to this study, there has been a decline in the prevalence of adolescents who are ever and current alcohol drinkers in Sabah. However, at 61.6%, the proportion of adolescents who drank alcohol for the first time before turning 14 years old remained high.

3.2.6 Recommendations

Given that adolescence is the age when adult habits and social standards are formed, it is essential to look into the issue of adolescent drinking. The detrimental effects of alcohol drinking at a young age should be made clear to parents and other caregivers through mass media. Enhance school-based prevention programmes in school with high rates of alcohol consumption to enable teachers to assess pupils for alcohol consumption and launch early intervention for such adolescents.

3.2.7 References

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Table 3.2.1: Prevalence of ever alcohol drinkers among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
SABAH	439	44184	22.2	14.85	31.84
Sex					
Male	220	23028	23.5	15.86	33.29
Female	219	21156	21.0	12.79	32.45
Form					
Form 1	78	7302	17.0	9.40	28.88
Form 2	99	9448	22.6	12.92	36.51
Form 3	83	9697	24.9	16.84	35.24
Form 4	109	10527	28.1	15.77	44.94
Form 5	70	7210	19.0	11.01	30.77
Ethnicity					
Malay	70	7127	11.8	8.94	15.38
Chinese	88	7760	51.4	38.64	63.95
Indian	3	-	-	-	-
Bumiputera Sabah	237	24587	75.7	15.41	36.13
Bumiputera Sarawak	8	773	37.0	20.13	57.74
Others	33	-	-	-	-

- Prevalence with high RSE, not reported

Table 3.2.2: Prevalence of current alcohol drinkers among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
SABAH	175	17973	9.0	5.52	14.43
Sex					
Male	93	9886	10.1	6.09	16.23
Female	82	8086	8.0	4.37	14.25
Form					
Form 1	27	2530	5.9	3.09	10.98
Form 2	36	3387	8.1	4.43	14.35
Form 3	36	4288	11.0	6.82	17.34
Form 4	48	-	-	-	-
Form 5	28	-	-	-	-
Ethnicity					
Malay	26	2643	4.4	2.59	7.27
Chinese	34	2998	19.9	13.89	27.55
Indian	3	-	-	-	-
Bumiputera Sabah	91	9586	9.5	5.85	14.98
Bumiputera Sarawak	3	-	-	-	-
Others	18	-	-	-	-

- Prevalence with high RSE, not reported

Table 3.2.3: Proportion of ever alcohol drinkers according to alcohol initiation age among adolescents in Sabah, 2022

Initiation age of alcohol drinking	Unweighted count	Percentage (%)
Below 14 years old	223	61.6
14 years old and above	135	38.4

Table 3.2.4: Usual sources of obtaining alcohol in the past 30 days among current drinkers among adolescents in Sabah, 2022

Sources of obtaining alcohol	Unweighted count	Percentage (%)
I bought from a store, shop or from a street vendor	28	16.7
I gave someone else money to buy it for me	3	-
I got it from my friend	27	17.0
I got it from my family	87	53.6
I stole it or got it without permission	3	-
I got it some other way	15	9.0

- Prevalence with high RSE, not reported

Table 3.2.5: Number of times (got into trouble with family or friends, missed school or got into a fight as a result of drinking alcohol) among ever alcohol drinkers (proportion) among adolescents in Sabah, 2022

Number of times	Unweighted count	Percentage (%)
0 times	348	79.3
1 to 2 times	63	14.5
3 to 9 times	18	-
10 or more times	9	-

- Prevalence with high RSE, not reported

3.3 Dietary Behaviours

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3.3.1 Introduction

The changes in dietary practices are required across all age ranges, but adolescence should be a focus of particular attention because the changes in lifestyle and the development of dietary habits during that stage of life have striking effects[1]. Poor dietary intake during this life stage is closely related to overweight and obesity, and unhealthy eating practices which lead to detrimental health effects later in life[2]. Therefore, a study was conducted to examine dietary practices with regards to fruit and vegetable intakes, carbonated drinks, plain water, milk and milk products intake and fast-food consumption among adolescents in Sabah. Establishing and consuming a nutrient-dense diet during the transition from adolescence into young adulthood may protect against future chronic diseases, promote optimal health outcomes and to prevent excess weight gain[3].

3.3.2 Objectives

i. To describe the prevalence of adolescents who had gone hungry in the past 30 days
ii. To describe the prevalence of fruit intakes of at least twice daily in the past 30 days among adolescents
iii. To identify the prevalence of vegetable consumption of at least three times daily in the past 30 days
iv. To identify the prevalence of fruit and vegetables consumption of at least five times daily in the past 30 days
v. To describe the prevalence of carbonated drink intake of at least once a day in the past 30 days
vi. To describe the prevalence of plain water intake of less than 6 glasses per day in the past 30 days
vii. To identify the prevalence of milk and milk product intakes of at least two times daily in the past 30 days
viii. To identify the prevalence of fast-food consumption of at least three days in the past 7 days

3.3.3 Variable definitions

- **Gone Hungry**: Adolescents who had gone hungry most of the time or always because there was not enough food at home for the past 30 days, or living without financial means to access enough food for active and healthy living.
- **Fruit intakes**: Fruits intake of at least twice daily in the past 30 days, inclusive all types of fruits.
- **Vegetable intakes**: Vegetable intakes of at least three times daily in the past 30 days.
- **Plain water intake**: Includes mineral water, boiled water or tap water
- **Carbonated drinks intake**: carbonated drinks consumption of at least once daily in the past 30 days.
- **Dairy product intake**: milk and milk product intakes at least two times daily in the past 30 days.
- **Fast food intake**: Consuming food from fast food outlets at least three days in the past seven days.

3.3.4 Findings

Gone hungry
About 2.7% (95% CI: 2.15, 3.51) of adolescents reported being hungry most of the time or always because there was not enough food at home in the past 30 days **(Table 3.3.1)**. Prevalence of being hungry was higher among females (3.1%, 95% CI: 2.12, 4.54) as compared to male counterparts (2.4%, 95% CI: 1.64,3.45).

Fruit consumption
A total of 40.0% (95% CI: 36.81, 43.34) of adolescents consumed fruit at least twice daily in the past 30 days **(Table 3.3.2)**. Males (42.0%, 95% CI: 37.68, 46.47) reported higher fruit intake than females (38.0%, 95% CI: 34.57, 41.62).

Vegetable consumption
About 32.1% (95% CI: 27.74, 36.69) of adolescents consumed vegetables at least three times daily in the past 30 days **(Table 3.3.3)**. Males reported significantly higher vegetable intake (34.7%, 95% CI: 30.07, 39.71) compared to females (29.3%, 95% CI: 24.31, 34.92).

Fruits and vegetables intake
About 19.8% (95% CI: 16.66, 23.27) of adolescents consumed fruits and vegetables at least five times daily in the past 30 days **(Table 3.3.4)**. Males (21.4%, 95% CI: 17.84, 25.54) reported significantly higher consumption of fruits and vegetables than females (18.1%, 95% CI: 14.56, 22.17).

Never Consume Fruit
About 10.2% (95% CI: 8.27, 12.48) of adolescents reported never consume fruit in the past 30 days **(Table 3.3.5)**. Prevalence of never consume fruit was 9.3% (95% CI: 7.10, 12.02) among males and 11.1% (95% CI: 8.58, 14.27) among females.

Never Consume Vegetable
About 7.4% (95% CI: 5.59, 9.87) of adolescents never consume vegetable in the past 30 days **(Table 3.3.5)**. Prevalence of never consume vegetable was 6.7% (95% CI: 4.49, 9.05) among males and 8.2% (95% CI: 5.70, 11.66) among females.

Never Consume Fruit and Vegetable
A total of 2.1% (95% CI: 1.27, 3.33) of adolescents never consume fruit and vegetable in the past 30 days **(Table 3.3.5)**. Prevalence of never consume fruit and vegetable was 1.5% (95% CI: 0.83, 2.58) among males and 2.7% (95% CI: 1.45, 4.85) among females.

Carbonated soft drinks intake

Overall, 42.8% (95% CI: 37.83, 47.83) of adolescents consumed carbonated soft drinks at least once daily in the past 30 days **(Table 3.3.6)**. Males (43.5%, 95% CI: 38.12, 49.00) consumed carbonated soft drinks more frequently than females (42.0%, 95% CI: 35.60, 48.72).

Plain water intake

About 51.1% (95% CI: 47.72, 54.54) adolescents drank plain water less than six glasses per day in the past 30 days **(Table 3.3.7)**. The prevalence of plain water intake of less than six glasses per day among females (57.5%, 95% CI: 53.43, 61.53) was significantly higher than males (44.8%, 95% CI: 40.07, 49.65).

Milk and milk products intake

About 21.0% (95% CI: 19.27, 22.81) of adolescents consumed milk/milk products at least two times per day in the past 30 days **(Table 3.3.8)**. Findings showed that the prevalence of milk/milk products consumption among females (21.8%, 95% CI: 19.38, 24.38) was slightly higher compared to males (20.2%, 95% CI: 16.65, 24.42)

Fast food intake

About 12.8% (95% CI: 11.23, 14.48) of adolescents consumed fast food at least three days in the past seven days **(Table 3.3.9)**. The prevalence of fast-food intake was significantly higher among females (14.0%, 95% CI: 11.47, 17.01) compared to males (11.5%, 95% CI: 9.28, 14.26).

3.3.5 Discussions / Conclusion

There were 2.7% of adolescents who reported being hungry due to lack of food at homes. Prevalence of adolescents reported consuming fruits at least twice daily and vegetables at least three times daily was 40.0% and 32.1%, respectively. However, only 19.8% of them consumed fruits and vegetables five times daily. About 51.1% of adolescents reported drinking plain water less than 6 glasses and 21.0% consumed milk/milk products at least two times daily. The consumption of carbonated soft drinks of at least once daily in the past 30 days was reported at 42.8% while 12.8% consumed food from fast food restaurants for at least three days in the past seven days.

3.3.6 Recommendations

The research finding shows that there is a crucial need to alter the behaviours of Sabah adolescents in order to prepare them for healthier adulthood. Poor dietary behaviours developed during adolescence may lead to diet related diseases in later years. Behaviour modification is the key recommendation suggested for improving healthy eating and lifestyle. It is necessary to improve dietary behaviour by encouraging them to consume nutritious foods such as fruits, vegetables, milk and milk products. This may be achieved through strengthening school-based nutrition interventions, using social marketing approach and mobilising families and communities into support. It is crucial to extend school-based nutrition intervention programmes, such as *Program Hidangan Berkhasiat di Sekolah* (HiTS) to all schools. Aggressive promotion of healthy foods and the benefits of eating it should be made in all platforms, including social media. Intersectoral collaboration through various sectors is essential for the implementation of these strategies, so that nutrition programmes could be incorporated into their policies and improve access and availability of healthy foods in schools, food premises and the community.

Table: Dietary behaviour trend among adolescents in Sabah

	NHMS 2012	NHMS 2017	NHMS 2022
Most of the time or always went hungry	3.8	4.0	2.7
Fruits intake of at least twice daily	44.9	48.6	40.0
Vegetables intake of at least three times daily	33.4	43.6	32.1
Fruits and vegetables intake of at least five times daily	31.8	27.3	19.8
Carbonated soft drinks consumption at least once daily	38.7	46.9	42.8
Milk/milk products intake of at least two times daily	Not reported	28.4	21.0
Fast food intake of at least three days in the past seven days	6.3	12.5	12.8

3.3.7 References

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2. Mittal M, Jain V. Management of Obesity and Its Complications in Children and Adolescents. Indian J Pediatr. 2021 Dec;88(12):1222-1234
3. Kansra AR, Lakkunarajah S, Jay MS. Childhood and Adolescent Obesity: A Review. Front Pediatr. 2021 Jan 12;8:581461

Table 3.3.1: Prevalence of adolescents in Sabah who most of the time or always went hungry in the past 30 days because there was not enough food in his/her home, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
SABAH	58	5689	2.7	2.15	3.51
Sex					
Male	24	2485	2.4	1.64	3.45
Female	34	3203	3.1	2.12	4.54
Form					
Form 1	12	1113	2.5	1.47	4.09
Form 2	13	1249	2.8	1.71	4.63
Form 3	10	-	-	-	-
Form 4	12	1108	2.9	1.68	4.91
Form 5	11	-	-	-	-
Ethnicity					
Malay	19	1914	2.9	2.04	4.17
Chinese	5	429	2.8	1.84	4.32
Indian	0	-	-	-	-
Bumiputera Sabah	29	2906	2.8	1.96	4.03
Bumiputera Sarawak	1	-	-	-	-
Others	4	-	-	-	-

- Prevalence with high RSE, not reported

Table 3.3.2: Prevalence of fruit intake of at least twice daily in the past 30 days among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
SABAH	832	82897	40.0	36.81	43.34
Sex					
Male	421	43749	42.0	37.68	46.47
Female	411	39148	38.0	34.57	41.62
Form					
Form 1	219	21026	46.4	40.88	52.06
Form 2	199	18819	42.5	36.65	48.64
Form 3	159	17894	43.5	36.03	51.24
Form 4	139	13432	35.0	28.47	42.04
Form 5	116	11726	30.9	26.20	36.00
Ethnicity					
Malay	281	27762	42.3	36.41	48.49
Chinese	50	4411	29.0	19.10	41.49
Indian	13	-	-	-	-
Bumiputera Sabah	407	41210	39.9	36.05	43.81
Bumiputera Sarawak	9	896	42.8	25.40	62.24
Others	80	8066	41.3	32.20	51.04

- Prevalence with high RSE, not reported

Table 3.3.3: Prevalence of vegetables intake of at least three times daily in the past 30 days among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
SABAH	662	66369	32.1	27.74	36.69
Sex					
Male	345	36173	34.7	30.07	39.71
Female	317	30196	29.3	24.31	34.92
Form					
Form 1	163	15685	34.6	27.50	42.53
Form 2	175	16782	37.9	32.33	43.88
Form 3	112	12602	30.6	25.53	36.24
Form 4	111	10921	28.4	22.17	35.62
Form 5	101	10379	27.3	19.80	36.44
Ethnicity					
Malay	226	22318	34.0	29.07	39.38
Chinese	33	2997	19.7	13.20	28.41
Indian	4	-	-	-	-
Bumiputera Sabah	326	33304	32.2	27.43	37.41
Bumiputera Sarawak	6	601	28.8	15.10	47.80
Others	67	6736	34.5	26.09	44.00

- Prevalence with high RSE, not reported

Table 3.3.4: Prevalence of fruits and vegetables intake of at least five times daily in the past 30 days among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
SABAH	411	41000	19.8	16.66	23.27
Sex					
Male	214	22398	21.4	17.84	25.54
Female	197	18602	18.1	14.56	22.17
Form					
Form 1	106	10176	22.4	17.37	28.42
Form 2	113	10797	24.4	19.86	29.50
Form 3	71	7888	19.1	14.29	24.97
Form 4	61	6035	15.7	11.15	21.66
Form 5	60	6104	16.1	12.07	21.09
Ethnicity					
Malay	135	13310	20.2	16.07	25.01
Chinese	19	1717	11.3	6.48	18.96
Indian	3	-	-	-	-
Bumiputera Sabah	213	21523	20.8	17.39	24.73
Bumiputera Sarawak	5	-	-	-	-
Others	36	3648	18.7	11.95	28.00

- Prevalence with high RSE, not reported

Table 3.3.5: Prevalence of adolescents who did not consume fruit, vegetable or both in the past 30 days in Sabah, 2022

Socio-demographic characteristics	Never consume fruit					Never consume vegetable					Never consume fruit and vegetable				
	Unweighted count	Estimated population	Prevalence (%)	95 % CI		Unweighted count	Estimated population	Prevalence (%)	95 % CI		Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper				Lower	Upper				Lower	Upper
SABAH	211	21091	10.2	8.27	12.48	153	15426	7.4	5.59	9.87	41	4270	2.1	1.27	3.33
Sex															
Male	94	9653	9.3	7.10	12.02	68	6987	6.7	4.94	9.05	15	1526	1.5	0.83	2.58
Female	117	11438	11.1	8.58	14.27	85	8439	8.2	5.70	11.66	26	2743	2.7	1.45	4.85
Form															
Form 1	56	5431	12.0	8.72	16.26	34	3404	7.5	4.50	12.30	12	-	-	-	-
Form 2	34	3064	6.9	4.57	10.37	43	4113	9.3	6.74	12.69	4	-	-	-	-
Form 3	47	5437	13.2	9.63	17.85	30	3456	8.4	5.58	12.46	12	1393	3.4	2.07	5.50
Form 4	37	3398	8.8	6.30	12.27	19	-	-	-	-	9	-	-	-	-
Form 5	37	3762	9.9	7.64	12.76	27	2621	6.9	4.34	10.82	4	-	-	-	-
Ethnicity															
Malay	81	7944	12.1	9.42	15.45	60	6048	9.2	6.64	12.68	18	1852	2.8	1.51	5.23
Chinese	14	-	-	-	-	10	-	-	-	-	3	-	-	-	-
Indian	1	-	-	-	-	1	-	-	-	-	0	-	-	-	-
Bumiputera Sabah	89	8962	8.7	6.84	10.93	64	6594	6.4	4.26	9.44	15	-	-	-	-
Bumiputera Sarawak	3	-	-	-	-	1	-	-	-	-	0	-	-	-	-
Others	23	2477	12.7	7.36	20.99	17	1662	8.5	4.97	14.18	5	-	-	-	-

- Prevalence with high RSE, not reported

Table 3.3.6: Prevalence of carbonated soft drinks intake of at least once a day in the past 30 days among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
SABAH	883	88492	42.8	37.83	47.83
Sex					
Male	432	45236	43.5	38.12	49.00
Female	451	43256	42.0	35.60	48.72
Form					
Form 1	193	18728	41.4	32.30	51.23
Form 2	223	21370	48.3	39.17	57.55
Form 3	161	18326	44.5	38.83	50.38
Form 4	155	14879	38.7	31.79	46.14
Form 5	151	15190	40.0	32.04	48.54
Ethnicity					
Malay	327	32332	49.4	45.04	53.75
Chinese	40	3543	23.3	15.02	34.35
Indian	7	761	57.3	29.43	81.20
Bumiputera Sabah	416	42251	40.9	35.52	46.46
Bumiputera Sarawak	10	1050	50.2	26.29	74.07
Others	83	8555	43.8	36.67	51.20

Table 3.3.7: Prevalence of plain water intake of less than 6 glasses per day in the past 30 days among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
SABAH	1066	105840	51.1	47.72	54.54
Sex					
Male	446	46620	44.8	40.07	49.65
Female	620	59221	57.5	53.43	61.53
Form					
Form 1	260	24989	55.3	48.67	61.76
Form 2	227	21261	48.1	41.89	54.28
Form 3	186	21033	51.1	43.98	58.20
Form 4	208	19860	51.7	45.14	58.16
Form 5	185	18698	49.2	43.38	55.14
Ethnicity					
Malay	371	36651	56.0	49.36	62.40
Chinese	78	6814	44.8	36.80	53.17
Indian	6	-	-	-	-
Bumiputera Sabah	504	50634	49.0	45.15	52.83
Bumiputera Sarawak	12	1187	56.7	33.51	77.34
Others	95	9968	51.0	41.11	60.89

- Prevalence with high RSE, not reported

Table 3.3.8: Prevalence of milk and milk products intake of at least two servings per day in the past 30 days among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
SABAH	439	43419	21.0	19.27	22.81
Sex					
Male	204	21003	20.2	16.56	24.42
Female	235	22415	21.8	19.38	24.38
Form					
Form 1	97	9310	20.6	16.81	25.00
Form 2	105	9836	22.3	19.54	25.27
Form 3	79	8902	21.6	18.70	24.88
Form 4	73	6994	18.2	14.45	22.66
Form 5	85	8377	22.1	17.24	27.79
Ethnicity					
Malay	148	14422	22.1	18.43	26.18
Chinese	26	2243	14.8	8.73	23.87
Indian	7	679	51.2	33.76	68.30
Bumiputera Sabah	212	21396	20.7	17.76	23.99
Bumiputera Sarawak	6	601	28.7	15.54	46.91
Others	40	4077	20.9	16.31	26.31

- Prevalence with high RSE, not reported

Table 3.3.9: Prevalence of fast-food intake of at least three days in the past 7 days among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
SABAH	266	26412	12.8	11.23	14.48
Sex					
Male	116	11989	11.5	9.28	14.26
Female	150	14422	14.0	11.47	17.01
Form					
Form 1	61	5887	13.0	9.27	18.02
Form 2	68	6362	14.4	11.03	18.60
Form 3	45	5280	12.8	9.34	17.37
Form 4	44	4089	10.6	8.32	13.51
Form 5	48	4793	12.6	9.49	16.61
Ethnicity					
Malay	90	8938	13.7	10.92	16.99
Chinese	16	1356	8.9	5.82	13.44
Indian	2	-	-	-	-
Bumiputera Sabah	129	12965	12.5	10.20	15.33
Bumiputera Sarawak	3	-	-	-	-
Others	26	2638	13.5	9.44	18.95

- Prevalence with high RSE, not reported

3.4 Nutritional Status

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3.4.1 Introduction

Adolescence is a unique phase of human development for individuals between the ages of 10 and 19 years old, as it caters to rapid growth, as well as sexual and behavioural changes. Good nutrition during adolescence is critical to address current nutritional needs and to fill nutrient gaps that have occurred during childhood[1]. The nutritional status of adolescents is assessed using anthropometric measurements (weight and height) and interpreted using WHO 2007 Growth Reference Data for 5-19 years[2]. The indicators include stunting, thinness, overweight and obesity.

3.4.2 Objectives

i. To determine the prevalence of stunting among adolescents
ii. To determine the prevalence of thinness among adolescents
iii. To determine the prevalence of overweight and obesity among adolescents

3.4.3 Variable definitions

- **Body mass index (BMI)**: commonly used to determine weight status. BMI is calculated by dividing a person's weight in kilograms by the square of height in meters.
- **Height for age z-score (HAZ)**: an index used to assess how a child's height compares to the expected height of a healthy child of the same age and sex based on the WHO 2007 Growth reference data for 5-19 years.
- **BMI for age z-score (BAZ)**: an index used to assess BMI is age- and sex-specific compares to the BMI of a healthy child of the same age and sex based on the WHO 2007 Growth reference data for 5-19 years.
- **Stunting**: Those who have their HAZ more than two standard deviations below the WHO Child Growth Standards median(<-2SD).
- **Thinness**: Those who have their BAZ more than two standard deviations below the WHO Child Growth Standards median(<-2SD).
- **Overweight**: Those who have their BAZ is more than one standard deviations to two standard deviations above the WHO Child Growth Standards median (>+1SD to ≤+2SD).
- **Obesity**: Those who have their BAZ more than two standard deviations above the WHO Child Growth Standards median(>+2SD).

3.4.4 Findings

Height-for-Age z-score
The prevalence of stunting among adolescents was 10.7% (95% CI: 8.59, 11.34). Females [12.8%, (95% CI: 9.68, 16.87)] showed higher prevalence compared to males [8.5%, (95% CI: 6.30, 11.34)]. **(Table 3.4.1)**.

BMI -for-Age z-score
According to the WHO 2007 Growth Reference Data for 5-19 years, the prevalence of thinness among adolescents was 7.7% (95% CI: 6.12, 9.54). The data showed that the prevalence of thinness was significantly higher among males [10.0%, (95% CI: 7.30, 13.49)] compared to females [5.3%, (95% CI: 4.18, 6.70)]. **(Table 3.4.2)**.

Overweight and Obesity
The prevalence of overweight was 14.3% (95% CI: 12.67, 16.14). Comparing the sexes, males had a higher prevalence at 14.9% (95% CI: 12.53, 17.74)] compared to females [13.7% (95% CI: 11.40, 16.31]. **(Table 3.4.3)**. For obesity, the prevalence was 10.8% (95% CI: 9.22, 12.64). Between the sexes, males had a higher prevalence of obesity at 13.6% (95% CI: 11.03, 16.73) compared to females [7.9% (95% CI: 5.95, 10.53)]. **(Table 3.4.3)**.

3.4.5 Discussion / Conclusion

Overall, the prevalence of overweight and obesity totalling 30.5% was higher than thinness (8.3%) and stunting (6.8%). It can be concluded that Sabah is facing a dual burden of malnutrition, with overnutrition appearing to be a larger problem than undernutrition. Therefore, appropriate actions to address these issues need to be undertaken the soonest.

3.4.6 Recommendations

Based on the findings, the integration of targeted interventions and policies is required to simultaneously address both undernutrition and the increasing rates of overweight and obesity among adolescents. Evidence-based nutrition-sensitive interventions, inclusive of diet counselling and nutrition education provided through school-based platforms, adolescent youth centres/ peer education and technology-based platforms should be strengthened. A comprehensive intervention such as MyBFF@school (an intervention consisting of nutrition education, physical activity and motivational component) could be implemented nationwide with the support of the Ministry of Education.

3.4.7 References

1. Das JK, Salam RA, Thornburg KL, et al. Nutrition in adolescents: physiology, metabolism, and nutritional needs. Ann. N. Y. Acad. Sci.. 2017 Apr;1393(1):21-33
2. World Health Organization 2007. Growth reference data for 5-19 years. Geneva: WHO

Table 3.4.1: Prevalence of stunting (HAZ <-2SD) among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
SABAH	217	22092	10.7	8.59	13.14
Sex					
Male	82	8856	8.5	6.30	11.34
Female	135	13236	12.8	9.68	16.87
Form					
Form 1	34	3243	7.1	4.39	11.42
Form 2	37	3452	7.8	5.26	11.43
Form 3	39	4621	11.2	7.94	15.50
Form 4	40	3906	10.2	6.11	16.45
Form 5	67	6871	18.1	13.63	23.63
Ethnicity					
Malay	67	6671	10.1	7.62	13.30
Chinese	2	-	-	-	-
Indian	0	-	-	-	-
Bumiputera Sabah	127	13015	12.6	10.23	15.43
Bumiputera Sarawak	2	-	-	-	-
Others	19	2029	10.4	6.49	16.22

- Prevalence with high RSE, not reported

Table 3.4.2: Prevalence of thinness (BAZ <-2SD) among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
SABAH	158	15872	7.7	6.12	9.54
Sex					
Male	101	10421	10.0	7.30	13.49
Female	57	5451	5.3	4.18	6.70
Form					
Form 1	23	2270	5.0	2.62	9.36
Form 2	33	3089	7.0	4.26	11.19
Form 3	30	3268	7.9	5.25	11.71
Form 4	33	3224	8.4	6.37	10.97
Form 5	39	4021	10.6	8.13	13.68
Ethnicity					
Malay	50	4995	7.6	5.94	9.60
Chinese	11	-	-	-	-
Indian	1	-	-	-	-
Bumiputera Sabah	72	7237	7.0	5.13	9.48
Bumiputera Sarawak	3	-	-	-	-
Others	21	-	-	-	-

- Prevalence with high RSE, not reported

Table 3.4.3: Prevalence of overweight (BAZ >+1SD to ≤+2SD) and obesity (BAZ >+2SD) among adolescents in Sabah, 2022

Socio-demographic characteristics	Overweight (>+1SD to ≤+2SD)					Obese (>+2SD)				
	Unweighted count	Estimated population	Prevalence (%)	95 % CI		Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper				Lower	Upper
SABAH	295	29689	14.3	12.67	16.14	219	22419	10.8	9.22	12.64
Sex										
Male	151	15615	14.9	12.53	17.74	136	14239	13.6	11.03	16.73
Female	144	14074	13.7	11.40	16.31	83	8180	7.9	5.95	10.53
Form										
Form 1	73	6994	15.4	11.33	20.68	62	5975	13.2	10.28	16.77
Form 2	68	6669	15.0	10.89	20.42	41	4101	9.3	6.07	13.85
Form 3	47	5433	13.1	9.21	18.39	50	5793	14.0	9.79	19.64
Form 4	58	5644	14.7	10.90	19.51	34	3282	8.5	6.27	11.53
Form 5	49	4950	13.0	9.38	17.84	32	3267	8.6	6.72	10.95
Ethnicity										
Malay	84	8328	12.6	10.37	15.28	68	6908	10.5	7.52	14.40
Chinese	32	2919	19.2	15.89	23.04	18	1648	10.8	8.04	14.48
Indian	1	-	-	-	-	5	-	-	-	-
Bumiputera Sabah	149	15400	14.9	12.72	17.38	102	10638	10.3	8.10	12.99
Bumiputera Sarawak	6	572	27.4	13.57	47.47	2	-	-	-	-
Others	23	2372	12.2	8.57	17.07	24	2502	12.9	8.66	18.71

- Prevalence with high RSE, not reported

3.5 Drug Use

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3.5.1 Introduction

According to the World Drug Report 2022 (WDR 2022) by the United Nations Office on Drugs and Crime (UNODC), an estimated 284 million people had used drugs within the previous year, which accounts for a 26% increase over the previous decade.[1] Drug use accounts for 5% of all substance related death and 9% of substance-use-related DALYs. Despite the report showing that young people continue to use more drugs than adults, it was found that drug use by adolescents decreased during the COVID-19 pandemic, which coincided with the lockdown periods.[1] Marijuana or cannabis remains the world's most widely used drug, with an annual prevalence of 4% of the adult population, or an estimated 209 million users in the past year.[1] Amphetamines remain the second most commonly used drug worldwide, with an estimated 34 million in 2020, representing 0.7% of the global population. NHMS 2019 showed that marijuana is the highest taken in Malaysia, followed by kratom.[2] Based on the statistics provided by the National Anti-Drug Agency in 2020 showed that ATS is the most commonly used drug among adolescents in Malaysia aged 13 to 18 years old, followed by marijuana and opiate.[3] In this survey, we have added new questions, which include kratom and inhalant, to get baseline data on adolescent usage in Malaysia, as we don't have preliminary national data on these drugs.

3.5.2 Objectives

i. To determine the prevalence and sociodemographic characteristics of ever and current drug use among adolescents
ii. To determine the prevalence and sociodemographic characteristics of ever and current marijuana use among adolescents in Malaysia
iii. To determine the prevalence and sociodemographic characteristics of ever and current amphetamines or methamphetamines use among adolescents in Malaysia
iv. To determine the prevalence and sociodemographic characteristics of ever and current inhalant use among adolescents in Malaysia
v. To determine the prevalence and sociodemographic characteristics of ever and current kratom use among adolescents in Malaysia
vi. To identify the age of initiation and the sources of obtaining drugs among adolescents in Malaysia

3.5.3 Variable Definitions

- **Drug use:**
  i. **2017** definition: taking heroin, morphine, glue, amphetamine, or methamphetamines (ecstasy, syabu, ice), marijuana (except prescribed medicine).
  ii. **2022** definition: taking opiates, amphetamine-type stimulants, marijuana, psychotropic pill, cocaine, inhalant and others (depressants, hallucinogens).
- **Ever drug use**: adolescents who had a history of drug use in their lifetime
- **Current drug use**: adolescents who used drugs in the past 30 days
- **Ever marijuana use**: adolescents who had a history of marijuana use in their lifetime
- **Current marijuana use**: adolescents who used marijuana in the past 30 days
- **Ever amphetamine or methamphetamine use**: adolescents with a history of amphetamine or methamphetamines use in their lifetime
- **Ever inhalant use**: adolescents who had a history of inhalant use in their lifetime
- **Current inhalant use**: adolescents who used an inhalant in the past 30 days
- **Ever kratom use**: adolescents who had a history of kratom use in their lifetime
- **Current kratom use**: adolescents who used kratom in the past 30 days

3.5.4 Findings

Overall, 4.8% (95% CI: 3.07, 7.39) of adolescents reported that they had ever used drug during their lifetime and it was significantly higher among males [7.0% (95%CI: 3.96, 11.95)] as compared to females [2.8% (95%CI: 1.95, 4.06)] **(Table 3.5.1)**. The prevalence of current drug users was 3.2% (95%CI: 1.86, 5.47); females at 1.6% (95%CI: 0.97, 2.74)] **(Table 3.5.2)**. Among current users, about 37.8% gave someone else money to buy it for them. **(Table 3.5.3)**. Among ever drug users, 62.1% (95% CI: 40.59, 79.77) of them had initiated before the age of 14 years old **(Table 3.5.4)**.

3.5.5 Discussion / Conclusion

Prevalence of drug use (ever and current) among adolescent had increased in Sabah since 2017. Among current drug user, the majority 37.8% had gave someone else money to buy it.

3.5.6 Recommendations

The effectiveness of drug education at primary schools plays a vital role in reducing current drug use prevalence in 2022 compared to 2017. Drug prevention among adolescents should be improved and regularly reviewed to meet the ever-changing trend of drug use locally and globally. New strategies and approaches can be developed

to address issues of inhalant and kratom use among adolescents by focusing more on the danger of inhalant and kratom use. An adolescent who has been exposed to and involved in drug abuse must be given access to treatment and provided educational opportunities, vocational skills training and other socioeconomic support needed. School drug prevention programs developed for adolescents can be integrated with technology, such as web-based intervention, to make it more interesting in increasing awareness and help build self-resilience among adolescents through:

- Conducting early detection of an adolescent with problems or who are at risk of drug abuse
- Increasing the knowledge, understanding and awareness of the dangers of drug abuse
- Increasing life skills such as assertiveness, coping skills and stress management
- Reinforcing positive attitudes and healthy lifestyles among school children

3.5.7 References

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Table 3.5.1: Prevalence of ever drug use among adolescents in Sabah, 2022

Socio-demographic characteristics	Ever used drug* based on 2017					Ever used drug**				
	Unweighted count	Estimated population	Prevalence (%)	95 % CI		Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper				Lower	Upper
SABAH	59	5964	3.2	2.01	5.08	88	8924	4.8	3.07	7.39
Sex										
Male	38	4056	4.6	2.46	8.39	58	6179	7.0	3.96	11.95
Female	21	1907	2.0	1.22	3.14	30	2745	2.8	1.95	4.06
Form										
Form 1	14	1389	3.7	2.03	6.79	17	1674	4.5	2.58	7.68
Form 2	9	-	-	-	-	12	-	-	-	-
Form 3	14	-	-	-	-	18	-	-	-	-
Form 4	12	1117	3.2	2.10	4.74	22	2138	6.0	3.55	10.09
Form 5	10	-	-	-	-	19	-	-	-	-
Ethnicity										
Malay	18	1788	3.3	1.83	6.02	29	-	-	-	-
Chinese	7	-	-	-	-	8	685	4.6	2.54	8.18
Indian	1	-	-	-	-	1	-	-	-	-
Bumiputera Sabah	28	-	-	-	-	44	4602	4.8	2.84	8.00
Bumiputera Sarawak	1	-	-	-	-	1	-	-	-	-
Others	4	-	-	-	-	5	-	-	-	-

- Prevalence with high RSE, not reported

**Drug includes heroin, morphine, glue, amphetamine, ecstasy, methamphetamine, ice and marijuana.*

***Drug includes opiate, amphetamine, marijuana, psychotropic pill, cocaine, inhalant, kratom and others.*

Table 3.5.2: Prevalence of current drug use among adolescents in Sabah, 2022

Socio-demographic characteristics	Current used drug* based on 2017					Current used drug** based on 2022				
	Unweighted count	Estimated population	Prevalence (%)	95 % CI		Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper				Lower	Upper
SABAH	50	5138	2.8	1.56	4.83	58	5975	3.2	1.86	5.47
Sex										
Male	34	-	-	-	-	41	-	-	-	-
Female	16	1509	1.6	0.90	2.65	17	1587	1.6	0.97	2.74
Form										
Form 1	14	-	-	-	-	14	-	-	-	-
Form 2	8	-	-	-	-	9	-	-	-	-
Form 3	14	-	-	-	-	15	-	-	-	-
Form 4	5	-	-	-	-	8	-	-	-	-
Form 5	9	-	-	-	-	12	-	-	-	-
Ethnicity										
Malay	19					22	2296	4.3	2.25	7.91
Chinese	6	-	-	-	-	6	-	-	-	-
Indian	0	-	-	-	-	0	-	-	-	-
Bumiputera Sabah	21	-	-	-	-	26	-	-	-	-
Bumiputera Sarawak	1	-	-	-	-	1	-	-	-	-
Others	3	-	-	-	-	3	-	-	-	-

- Prevalence with high RSE, not reported

**Drug includes heroin, morphine, glue, amphetamine, ecstasy, methamphetamine, ice and marijuana.*

***Drug includes opiate, amphetamine, marijuana, psychotropic pill, cocaine, inhalant, kratom and others.*

Table 3.5.3: Source of getting drugs in the past 30 days among current drug users among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Percentage (%)
I bought them form someone	7	32.1
I give someone else money to buy it for me	8	37.8
I stole it or got it without permission	3	-
I got it from my friend	1	-
I got it from my family	0	-
I got it some other ways	2	-

- Prevalence with high RSE, not reported

Table 3.5.4: Prevalence of first use of drug before the age of 14 years among ever used drug among adolescents in Sabah, 2022

Prevalence	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
Yes	13	1346	62.1	40.59	79.77
No	8	820	37.9	20.23	59.41

3.6 Oral and Hand Hygiene

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3.6.1 Introduction

Oral health is integral to general health as it promotes a positive quality of life and social self-confidence. Currently, oral diseases affect close to 3.5 billion people worldwide, and their prevalence is noted to be increasing globally. A resolution on oral health in 2021 by the WHO recommends a more preventive approach towards oral health, including oral health promotions at schools[1]. Empowering good oral hygiene habits during adolescence is important in sustaining this behaviour into adulthood[2]. Therefore, early and adequate plaque control is key in preventing oral health diseases such as dental caries and periodontal diseases, which may affect school performance and attendance, as well as permanent dental problems in adulthood. This can be achieved via regular tooth brushing with fluoridated toothpaste, dental flossing, tongue cleaning, and a minimum yearly dental check-up[3]. Appropriate hand hygiene practices using soap, especially before eating and after using the toilet, are protective against a multitude of infections. These practices will enable adolescents to thrive and contribute actively to learning and reduce the rate of absenteeism[4]. Assessing practices on good hand washing among adolescents will help detect at-risk groups among school attendees[4].

3.6.2 Objectives

3.6.2.1 General objective

To determine the prevalence of oral and hand hygiene behaviour among adolescents in Malaysia.

3.6.2.2 Specific objectives for oral hygiene

To describe the prevalence of:

i. Self-oral health perception
ii. Tooth brushing frequency in the past 30 days
iii. Tongue cleaning practice
iv. Fluoridated toothpaste usage
v. Dental floss usage
vi. Timing of the last visit to a dentist or dental nurse
vii. Having missed class or not participating in online learning due to toothache in the past 12 months
viii. Avoidance of smile or laughing due to the appearance of their teeth

3.6.2.3 Specific objectives for hand washing

To describe the prevalence of:

i. Hand washing with soap in the past 30 days
ii. Hand washing before eating in the past 30 days
iii. Hand washing after using the toilet in the past 30 days
iv. Hand washing method before eating at school in the past 30 days

3.6.3 Variable definitions

- **Clean or brush teeth**: Regular tooth brushing using toothbrush and toothpaste to keep the mouth, teeth and gums clean and healthy
- **Last saw a dentist or dental nurse**: Seen a dentist or dental nurse for a check-up, scaling or other dental treatment

3.6.4 Findings

4.9% (95%CI: 3.76, 6.45) of adolescents in Sabah perceived their oral health as poor or very poor **(Table 3.6.1)**. 83.8% (95%CI: 81.98, 85.47) brushed their teeth twice daily which was significantly higher in females [87.4% (95%CI: 85.63, 88.94)] **(Table 3.6.2)**, 3.5% (95% CI: 2.25, 5.53) never performed daily tongue cleaning **(Table 3.6.3)**, 47.3% (95%CI: 42.01, 52.72) reported not knowing whether their toothpaste contained fluoride **(Table 3.6.4)** and only 23.4% (95%CI: 20.19, 26.87) used dental floss for cleaning their teeth **(Table 3.6.5)**. Only 26.4% (95%CI: 21.48, 31.97) reported to have their last dental visit in the past 12 months **(Table 3.6.6)**, 15.4% (95% CI: 11.97, 19.47) had toothache in the past 12 months and had missed class or not participated with online learning (PdPR) **(Table 3.6.7)**. 30.1% (95%CI: 26.43, 33.96) reported that they had avoided smiling or laughing due to the appearance of their teeth which was significanty higher among females [37.7% (95%CI: 33.87, 41.78)] **(Table 3.6.8)**. The prevalence of Sabah adolescents who used soap most of the time or always was 67.2% (95%CI: 62.72, 71.44) **(Table 3.6.9)**. About 84.7% (95%CI: 80.20, 88.31) and 86.6% (95%CI: 83.42, 89.24) of adolescents washed their hands most of the time or always before eating **(Table 3.6.10)** or after using toilet respectively **(Table 3.6.11)**. Only 37.8% (95%CI: 33.14, 42.69) washed hands with running water before eating at school **(Table 3.6.12).**

3.6.5 Discussion / Conclusion

In general, oral hygiene behaviour among adolescents may be related to the COVID-19 pandemic that reduces school dental programs and attendance for dental checkups, which in turn may cause inadequate knowledge regarding best oral health practice among adolescents. Ironically, hand hygiene practice appear to be good which may also reflect the effect of COVID-19 pandemic that promotes frequent handwashing practice in general.

3.6.6 Recommendations

Taking cognizance of these findings, there is a need for continuous emphasis on promoting good personal oral and hand hygiene among adolescents through knowledge, attitude and behavioural improvements with these following recommendations:

- Oral health education at schools need to deliver captivating methods that can be easily assimilated into the adolescents' daily school and home routines which will enhance their retention of oral health care knowledge. Effective oral health education should be regularly revised, updated and tailored specifically for young adults to improve and empower their decision making in maintaining good oral health. Adolescents at high risk of developing oral diseases should be identified early and oral health intervention delivered and tailored to these targeted groups to enhance engagement and personalisation of oral care needs.
- Interventions to promote hand washing need to be tailored to the adolescent's understanding and relevant social norms to trigger and reinforce good and ideal handwashing practice and habit formation according to their environment and social situations. Schools should have policies that inculcate good handwashing behavior including adequate infrastructures to support regular and ideal handwashing practices, and readily available information visual aids about the correct hand washing technique at key times and places in schools. School health education unit with regular hygiene education programs should be included in the formal and non-formal curricular, preferably starting from pre and primary schools. Further studies are needed to develop an understanding and knowledge gap of the cultural context of handwashing habits in various ethnic and cultural groups.

3.6.7 References

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Table 3.6.1: Prevalence of poor or very poor perception of oral health among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
SABAH	103	10131	4.9	3.76	6.45
Sex					
Male	47	4894	4.7	3.34	6.71
Female	56	5237	5.1	3.40	7.65
Form					
Form 1	29	2744	6.1	3.99	9.31
Form 2	15	1328	3.1	1.87	4.95
Form 3	19	-	-	-	-
Form 4	16	-	-	-	-
Form 5	24	2489	6.6	4.61	9.24
Ethnicity					
Malay	30	3026	4.7	3.18	6.88
Chinese	11	977	6.4	4.86	8.46
Indian	0	-	-	-	-
Bumiputera Sabah	51	5021	4.9	3.33	7.09
Bumiputera Sarawak	4	-	-	-	-
Others	7	-	-	-	-

- Prevalence with high RSE, not reported

Table 3.6.2: Prevalence of teeth brushing 2 times a day in the past 30 days among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
SABAH	1733	171977	83.8	81.98	85.47
Sex					
Male	792	82609	80.2	77.21	82.97
Female	941	89368	87.4	85.63	88.94
Form					
Form 1	363	34421	76.9	72.20	80.96
Form 2	386	36330	83.8	78.42	88.04
Form 3	297	33869	83.2	75.59	88.84
Form 4	353	33594	87.4	82.84	90.91
Form 5	334	33763	88.9	84.29	92.33
Ethnicity					
Malay	529	51802	80.3	76.26	83.87
Chinese	133	11902	78.3	73.29	82.65
Indian	11	1166	87.8	44.80	98.46
Bumiputera Sabah	878	88580	86.0	84.33	87.49
Bumiputera Sarawak	17	1657	79.2	56.36	91.86
Others	165	16870	88.3	80.42	93.23

Table 3.6.3: Prevalence of never did tongue cleaning among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
SABAH	73	7261	3.5	2.25	5.53
Sex					
Male	47	4800	4.7	2.76	7.77
Female	26	2461	2.4	1.34	4.28
Form					
Form 1	17	-	-	-	-
Form 2	11	-	-	-	-
Form 3	16	-	-	-	-
Form 4	18	-	-	-	-
Form 5	11	1093	2.9	1.66	4.94
Ethnicity					
Malay	21	2160	3.3	2.07	5.37
Chinese	19	1675	11.0	6.80	17.39
Indian	0	-	-	-	-
Bumiputera Sabah	28	2885	2.8	1.88	4.14
Bumiputera Sarawak	0	-	-	-	-
Others	5	-	-	-	-

- Prevalence with high RSE, not reported

Table 3.6.4: Prevalence of did not know if their toothpaste is fluoridated among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
SABAH	982	97095	47.3	42.01	52.72
Sex					
Male	446	46362	45.0	38.59	51.66
Female	536	50732	49.6	43.55	55.75
Form					
Form 1	238	22680	50.6	40.99	60.26
Form 2	239	22343	51.6	44.15	59.06
Form 3	157	17942	44.1	33.91	54.80
Form 4	189	18000	46.8	34.10	60.00
Form 5	159	16130	42.5	36.10	49.13
Ethnicity					
Malay	272	26689	41.4	34.60	48.64
Chinese	111	9811	64.6	53.45	74.32
Indian	7	-	-	-	-
Bumiputera Sabah	487	49106	47.7	43.28	52.10
Bumiputera Sarawak	10	1012	48.4	25.03	72.47
Others	95	9804	51.3	36.91	65.46

- Prevalence with high RSE, not reported

Table 3.6.5: Prevalence of use of dental floss among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
SABAH	483	47897	23.4	20.19	26.87
Sex					
Male	214	22245	21.6	17.27	26.69
Female	269	25653	25.1	21.64	28.96
Form					
Form 1	130	12263	27.4	21.04	34.93
Form 2	113	10757	24.9	21.00	29.17
Form 3	70	8156	20.0	14.68	26.75
Form 4	89	8469	22.0	16.97	28.12
Form 5	81	8252	21.7	17.05	27.29
Ethnicity					
Malay	152	14889	23.2	17.70	29.69
Chinese	40	3499	23.0	19.31	27.22
Indian	3	-	-	-	-
Bumiputera Sabah	245	24703	24.0	20.17	28.25
Bumiputera Sarawak	6	-	-	-	-
Others	37	3922	20.5	12.90	31.02

- Prevalence with high RSE, not reported

Table 3.6.6: Prevalence of last dental visit in the past 12 months among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
SABAH	559	54119	26.4	21.48	31.97
Sex					
Male	270	27693	26.9	22.07	32.35
Female	289	26426	25.9	19.60	33.35
Form					
Form 1	126	11879	26.6	20.83	33.26
Form 2	125	11650	26.9	21.86	32.67
Form 3	77	8382	20.6	12.94	31.16
Form 4	122	11266	29.3	21.57	38.47
Form 5	109	10942	28.8	22.67	35.87
Ethnicity					
Malay	181	17609	27.4	22.59	32.77
Chinese	57	5071	33.4	28.80	38.29
Indian	5	-	-	-	-
Bumiputera Sabah	264	26040	25.3	18.29	33.83
Bumiputera Sarawak	7	-	-	-	-
Others	45	4238	22.2	13.52	34.18

- Prevalence with high RSE, not reported

Table 3.6.7: Prevalence of having missed classes or online learning among adolescents with toothache in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
SABAH	174	17347	15.4	11.97	19.47
Sex					
Male	77	8113	14.0	10.02	19.24
Female	97	9234	16.8	12.48	22.14
Form					
Form 1	39	3807	13.8	7.69	23.46
Form 2	36	3416	13.4	7.89	21.98
Form 3	29	3280	15.9	12.00	20.65
Form 4	25	2382	12.2	7.46	19.38
Form 5	45	4462	22.6	15.91	30.95
Ethnicity					
Malay	70	6901	18.2	12.78	25.18
Chinese	5	-	-	-	-
Indian	2	-	-	-	-
Bumiputera Sabah	75	7549	13.7	10.00	18.58
Bumiputera Sarawak	2	-	-	-	-
Others	20	2047	22.4	12.62	36.51

- Prevalence with high RSE, not reported

Table 3.6.8: Prevalence of avoidance of smiling due to teeth appearance among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
SABAH	624	61476	30.1	26.43	33.96
Sex					
Male	218	23015	22.4	18.14	27.40
Female	406	38461	37.7	33.87	41.78
Form					
Form 1	131	12607	28.3	22.05	35.45
Form 2	142	13160	30.5	23.35	38.72
Form 3	87	10094	24.9	20.12	30.32
Form 4	132	12287	32.1	24.95	40.14
Form 5	132	13328	35.2	29.35	41.51
Ethnicity					
Malay	179	17723	27.7	22.67	33.37
Chinese	62	5472	36.0	26.11	47.27
Indian	5	-	-	-	-
Bumiputera Sabah	321	32062	31.2	26.37	36.37
Bumiputera Sarawak	9	878	42.0	19.66	68.20
Others	48	4823	25.4	19.32	32.62

- Prevalence with high RSE, not reported

Table 3.6.9: Prevalence of using soap most of the time or always during handwashing in the past 30 days among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95% CI	
				Lower	Upper
SABAH	1389	137503	67.2	62.72	71.44
Sex					
Male	629	65309	63.6	57.24	69.61
Female	760	72194	70.8	67.03	74.38
Form					
Form 1	305	28900	64.9	57.39	71.81
Form 2	304	29017	67.4	61.44	72.87
Form 3	217	24730	60.9	54.00	67.47
Form 4	288	27174	70.7	61.22	78.69
Form 5	275	27682	72.9	64.57	79.90
Ethnicity					
Malay	406	39578	61.9	54.92	68.35
Chinese	110	9806	64.9	59.56	69.88
Indian	9	989	74.5	38.78	93.09
Bumiputera Sabah	721	72613	70.6	65.57	75.10
Bumiputera Sarawak	16	1547	74.0	39.98	92.40
Others	127	12970	67.9	55.29	78.28

Table 3.6.10: Prevalence of handwashing most of the time or always before eating in the past 30 days among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
SABAH	1738	173183	84.7	80.20	88.31
Sex					
Male	823	85907	83.8	78.94	87.73
Female	915	87276	85.6	79.85	89.86
Form					
Form 1	370	35222	79.2	71.39	85.30
Form 2	383	36520	84.8	75.68	90.97
Form 3	302	34325	84.6	77.74	89.61
Form 4	346	32975	85.8	77.21	91.52
Form 5	337	34141	89.9	85.44	93.14
Ethnicity					
Malay	547	53702	84.1	79.58	87.75
Chinese	110	9909	65.2	48.91	78.60
Indian	10	1091	82.2	44.51	96.38
Bumiputera Sabah	885	89450	86.9	83.05	90.02
Bumiputera Sarawak	19	1873	89.6	66.08	97.42
Others	167	17158	89.8	82.43	94.25

Table 3.6.11: Prevalence of handwashing most of the time or always after using the toilet in the past 30 days among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
SABAH	1782	176835	86.6	83.42	89.24
Sex					
Male	828	86299	84.3	80.50	87.45
Female	954	90536	88.9	85.49	91.63
Form					
Form 1	379	35845	80.6	71.07	87.52
Form 2	396	37544	87.4	82.61	91.02
Form 3	301	34201	84.5	79.01	88.77
Form 4	366	34746	90.4	85.27	93.89
Form 5	340	34499	91.1	86.69	94.15
Ethnicity					
Malay	529	51932	81.5	76.31	85.69
Chinese	154	13734	90.4	86.55	93.22
Indian	12	1229	92.6	53.66	99.26
Bumiputera Sabah	905	91342	88.9	85.18	91.81
Bumiputera Sarawak	20	2014	96.3	71.88	99.62
Others	162	16585	86.8	80.96	91.00

Table 3.6.12: Prevalence of handwashing using running water before eating at school in the past 30 days among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
SABAH	776	77151	37.8	33.14	42.69
Sex					
Male	329	34134	33.3	28.61	38.43
Female	447	43017	42.3	36.63	48.16
Form					
Form 1	157	15011	33.7	25.86	42.66
Form 2	171	16315	38.1	32.53	43.92
Form 3	144	16455	40.7	34.11	47.56
Form 4	148	13930	36.2	26.45	47.34
Form 5	156	15441	40.8	32.59	49.50
Ethnicity					
Malay	204	19704	30.9	24.35	38.42
Chinese	52	4652	30.6	26.31	35.29
Indian	5	-	-	-	-
Bumiputera Sabah	441	44732	43.5	38.25	49.00
Bumiputera Sarawak	10	1018	48.7	26.38	71.52
Others	64	6553	34.3	21.82	49.38

- Prevalence with high RSE, not reported

3.7 Mental Health Problems

3.7.1 Mental Health Problems

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3.7.1.1 Introduction

According to the World Health Organization (WHO), one in every seven children and adolescents suffers from mental health problems, accounting for 13.0% of the global disease burden in this age group.[1] In Malaysia, the National Health and Morbidity Survey (NHMS) 2015 found that the prevalence of mental health problems was 34.7% among those aged 16 to 19, and 11.4% among those aged 10 to 15.[2] However, findings from the NHMS 2019 revealed that the prevalence of mental health problems had decreased to 9.5% among those aged 10 to 15 years old.[3] In particular, WHO reported that suicide is the fourth leading cause of death among 15-19 year-olds.[1] In 2017, 10.0% of secondary school adolescents reported suicidal ideation, according to the NHMS.[4]

3.7.1.2 Objectives

i. To identify the prevalence of loneliness in the past 12 months
ii. To identify the prevalence of inability to sleep due to worry in the past 12 months
iii. To identify the prevalence of suicidal ideation in the past 12 months
iv. To identify the prevalence of suicidal plan in the past 12 months
v. To identify the prevalence of suicidal attempt in the past 12 months
vi. To identify the prevalence of not having close friends

3.7.1.3 Variable definitions

- **Lonely "most of the time or always"**: Responded either "most of the time" or "always" for felt lonely during the past 12 months prior to the survey.
- **Unable to sleep "most of the time or always" due to worry**: Responded either "most of the time" or "always" for being worried about something that he/she could not sleep at night during the past 12 months prior to the survey.
- **Suicidal ideation**: ever seriously considered attempting suicide in the past 12 months prior to the survey.
- **Suicidal plan**: made a plan of attempted suicide in the past 12 months prior to the survey.
- **Suicidal attempt**: attempted suicide at least once in the past 12 months prior to the survey.
- **No close friend**: Do not have any close friend.

3.7.1.4 Findings

Overall, 19.2% (95% CI: 16.15, 22.60) of adolescents in Sabah reported feeling lonely "most of the time or always" **(Table 3.7.1)**. A total of 14.9% (95% CI: 12.84, 17.33) of adolescents reported being unable to sleep "most of the time or always" due to worry. **(Table 3.7 2)**. In the past 12 months prior to the survey, suicidal ideation, suicidal plan, and suicidal attempt, were reported 14.5% (95%CI: 12.03, 17.48), 10.5% (95% CI: 8.22, 13.24), and 10.5% (95% CI: 8.75, 12.62), respectively. **(Table 3.7.3)**, **(Table 3.7.4)** **(Table 3.7.5)**. The survey also observed that 3.5% (95% CI: 2.73, 4.58) of the adolescents had no close friends **(Table 3.7.6)**.

3.7.1.5 Discussion / Conclusion

The trend of suicidal ideation among secondary school students in Sabah (14.5%) was higher than GSHS 2012 (8.8%) and GSHS 2017 (9.8%). This figure was also higher in comparison to national prevalence of 13.1%. Prevalence of suicidal plan in this survey (10.5%) was higher compared to the prevalence in GSHS 2012 (7.9%) and GSHS 2017 (7.3%). Moreover, this prevalence was also higher compared to the national prevalence of 10.0%. Prevalence of suicidal attempts in this survey (10.5%) was reported higher compared to the prevalence GSHS 2012 (7.2%) and GSHS 2017 (6.3%). This prevalence was also higher compared to national prevalence (9.5%). In addition to these, more students (3.5%) in Sabah reported having no close friends as compared to previous GSHS 2012 (3.2%) and GSHS 2017 (2.4%). This figure was lower compared to national prevalence (4.2%).

3.7.1.6 Recommendations

1. Enhanced the screening of at-risk adolescents by School Health Teams and referral for further management.
2. Intensify efforts to prevent suicide among student especially among high-risk group (attempt suicide).
3. Strengthen adolescents coping skills and resilience through interactive health promotion activities.
4. To introduce culturally competent programmes in school that upskill teachers and educate parents about risk of suicide among adolescents.
5. To improve the National school curriculum that teaches life skills such as effective coping strategies and develops mental resilience.
6. To review workplace policies with the aim of strengthening family ties such as the introduction of flexible working hours or the provision of options to work from home to increase quality time among parents and children.
7. To review school curriculum and teaching hours to optimize more time for physical activity and quality time for social and professional interaction among adolescents to improve adolescents' life skills.

Table: Mental Health Problems Trend in Sabah

	NHMS 2012	NHMS 2017	NHMS 2022
Loneliness	8.8	10.1	19.2
Inability to sleep due to worry	6.9	8.0	14.9
Suicidal ideation	8.8	9.8	14.5
Suicidal plan	7.9	7.3	10.5
Suicidal attempt	7.2	6.3	10.5
Not having any close friend	3.2	2.4	3.5

3.7.1.7 References

1. WHO Fact Sheet. Adolescent mental health. https://www.who.int/news-room/fact-sheets/detail/adolescent-mental-health. Updated on 17 November 2021
2. Institute for Public Health (IPH). 2015. National Health and Morbidity Survey, NHMS 2015. Ministry of Health Malaysia
3. Institute for Public Health (IPH). 2019. National Health and Morbidity Survey, NHMS 2019. Ministry of Health Malaysia
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3.7.2 Depression

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3.7.2.1 Introduction

Depression is a common mental health problem among adolescents worldwide. Depression can manifest as symptoms such as sadness, guilt, low self-esteem, a lack of happiness, and dissatisfaction with their surroundings.[1] Furthermore, depression can cause individual problems such as difficulty sleeping, loss of appetite, lack of energy, and easy despair, leading to suicidal ideation.[2] According to the World Health Organization (WHO), depression affects 1.1% of adolescents aged 10-14 years and 2.8% of those aged 15-19 years.[3] In Malaysia, the National Health and Morbidity Survey (NHMS) 2019 found that the prevalence of depression was 2.1% among those aged 15 to 19 years old.[4]

3.7.2.2 Objectives

To determine the prevalence of depression among Malaysian adolescents.

3.7.2.3 Variable definitions

Depression: A positive score was defined as a score of 10 and above for Patient Health Questionnaire (PHQ-9), and participants with these scores were categorized as having depression.

3.7.2.4 Findings

Overall, 29.7% (95% CI: 26.30, 33.30) of Sabah adolescents reported depression. The prevalence of depression was significantly higher in female students 39.2% (95% CI: 34.39, 44.26) compared to males 20.3% (95% CI: 16.74, 24.34) **(Table 3.7.7)**.

3.7.2.5 Discussion / Conclusion

This survey indicated a lower prevalence of depression than research done by Normala et al. among 1800 Malaysian secondary school students aged 13 to 17 years old, which reported a 32.7% prevalence of depression among adolescents. Normala's study employed the same depression-measuring tool, the PHQ-9, but it was limited to 10 of 37 randomly chosen secondary schools in the Hulu Langat district area in the state of Selangor.However, the prevalence of depression in Sabah was higher compared to the national figure 26.9%.

3.7.2.6 Recommendations

1. Enhanced the screening of at-risk adolescents by School Health Teams and referral for further management.
2. Holistic intervention programmes targeted to adolescents at risk of depression.
3. Strengthen adolescents coping skills and resilience through interactive health promotion activities.
4. To introduce culturally competent programmes in school that upskill teachers and educate parents about discipline style and pro social parenting techniques.
5. To improve the National school curriculum that teaches life skills such as effective coping strategies and develops mental resilience.
6. To review workplace policies with the aim of strengthening family ties, such as the introduction of flexible working hours or the provision of options to work from home to increase quality time among parents and children.
7. To review school curriculum and teaching hours to optimize more time for physical activity and quality time for social and professional interaction among adolescents to improve adolescents' life skills.

3.7.2.7 References

1. Aquino JP, Londono A, Carvalho AF. An update on the epidemiology of major depressive disorder across cultures. In Understanding depression 2018 (pp. 309-315). Springer, Singapore
2. Kaur J, Cheong SM, Mahadir Naidu B, Kaur G, Manickam MA, Mat Noor M, Ibrahim N, Rosman A. Prevalence and correlates of depression among adolescents in Malaysia. Asia Pac J Public Health. 2014 Sep;26(5_suppl):53S-62S
3. WHO Fact Sheet. Adolescent mental health. https://www.who.int/news-room/fact-sheets/detail/adolescent-mental-health. Updated on 17 November 2021
4. Institute for Public Health (IPH). 2019. National Health and Morbidity Survey, NHMS 2019. Ministry of Health Malaysia

Table 3.7.1: Prevalence of loneliness "most of the time or always" in the past 12 months among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
SABAH	401	39777	19.2	16.15	22.60
Sex					
Male	136	14316	13.7	10.91	17.07
Female	265	25462	24.7	20.27	29.77
Form					
Form 1	63	5972	13.2	9.35	18.19
Form 2	73	6584	14.9	9.95	21.59
Form 3	83	9519	23.0	16.55	31.06
Form 4	106	10020	26.1	21.03	31.84
Form 5	76	7683	20.2	16.78	24.20
Ethnicity					
Malay	104	10030	15.2	10.87	20.85
Chinese	18	1564	10.3	7.09	14.71
Indian	1	-	-	-	-
Bumiputera Sabah	235	23745	23.0	19.16	27.28
Bumiputera Sarawak	4	-	-	-	-
Others	39	3952	20.2	16.37	24.75

- Prevalence with high RSE, not reported

Table 3.7.2: Prevalence of inability to sleep "most of the time or always" due to worry in the past 12 months among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
SABAH	315	31019	14.9	12.84	17.33
Sex					
Male	100	10553	10.1	8.21	12.37
Female	215	20467	19.9	16.77	23.37
Form					
Form 1	53	5025	11.1	8.62	14.10
Form 2	58	5194	11.7	7.94	16.97
Form 3	53	6045	14.6	10.92	19.29
Form 4	85	8087	21.0	16.24	26.81
Form 5	66	6669	17.6	13.43	22.63
Ethnicity					
Malay	72	7032	10.7	7.76	14.46
Chinese	22	1912	12.6	6.99	21.61
Indian	2	-	-	-	-
Bumiputera Sabah	191	18992	18.4	15.29	21.92
Bumiputera Sarawak	2	-	-	-	-
Others	26	2716	13.9	9.95	19.11

- Prevalence with high RSE, not reported

Table 3.7.3: Prevalence of suicidal ideation in the past 12 months among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
SABAH	309	30177	14.5	12.03	17.48
Sex					
Male	80	8338	8.0	6.51	9.74
Female	229	21839	21.2	16.75	26.46
Form					
Form 1	64	6008	13.2	9.01	19.03
Form 2	67	6028	13.6	9.24	19.58
Form 3	52	6025	14.6	9.84	21.03
Form 4	65	5989	15.6	11.53	20.73
Form 5	61	6127	16.1	11.44	22.28
Ethnicity					
Malay	80	7718	11.7	9.07	14.97
Chinese	36	3141	20.7	18.17	23.42
Indian	2	-	-	-	-
Bumiputera Sabah	162	16224	15.7	12.16	20.03
Bumiputera Sarawak	3	-	-	-	-
Others	26	2624	13.4	8.56	20.46

- Prevalence with high RSE, not reported

Table 3.7.4: Prevalence of suicidal plan in the past 12 months among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
SABAH	223	21725	10.5	8.22	13.24
Sex					
Male	55	5784	5.5	3.92	7.76
Female	168	15941	15.5	12.15	19.51
Form					
Form 1	35	3307	7.3	5.10	10.30
Form 2	50	4440	10.0	6.21	15.76
Form 3	42	4831	11.7	7.85	17.03
Form 4	51	4688	12.2	7.73	18.72
Form 5	45	4460	11.7	7.60	17.72
Ethnicity					
Malay	53	5028	7.6	5.60	10.29
Chinese	16	1391	9.2	6.07	13.58
Indian	3	-	-	-	-
Bumiputera Sabah	130	12915	12.5	9.27	16.64
Bumiputera Sarawak	3	-	-	-	-
Others	18	1767	9.0	5.30	15.02

- Prevalence with high RSE, not reported

Table 3.7.5: Prevalence of suicidal attempt "at least once" in the past 12 months among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
SABAH	224	21848	10.5	8.75	12.62
Sex					
Male	66	6938	6.6	5.16	8.52
Female	158	14911	14.5	11.41	18.19
Form					
Form 1	48	4538	10.0	7.70	12.89
Form 2	48	4370	9.9	7.22	13.33
Form 3	41	4700	11.4	7.91	16.06
Form 4	47	4357	11.3	7.88	16.05
Form 5	40	3883	10.2	6.41	15.94
Ethnicity					
Malay	56	5372	8.1	6.13	10.75
Chinese	16	1417	9.3	6.11	13.99
Indian	1	-	-	-	-
Bumiputera Sabah	126	12445	12.0	9.71	14.84
Bumiputera Sarawak	3	-	-	-	-
Others	22	-	-	-	-

- Prevalence with high RSE, not reported

Table 3.7.6: Prevalence of not having any close friends among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
SABAH	73	7344	3.5	2.73	4.58
Sex					
Male	31	3258	3.1	2.33	4.16
Female	42	4085	4.0	2.80	5.59
Form					
Form 1	17	1679	3.7	2.51	5.41
Form 2	15	-	-	-	-
Form 3	15	1750	4.2	2.94	6.08
Form 4	14	-	-	-	-
Form 5	12	1200	3.2	1.95	5.08
Ethnicity					
Malay	24	2463	3.7	2.17	6.38
Chinese	3	-	-	-	-
Indian	0	-	-	-	-
Bumiputera Sabah	37	3595	3.5	2.11	5.69
Bumiputera Sarawak	1	-	-	-	-
Others	8	907	4.6	2.51	8.45

- Prevalence with high RSE, not reported

Table 3.7.7: Prevalence of depression among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
SABAH	621	61458	29.7	26.30	33.30
Sex					
Male	199	21134	20.3	16.74	24.34
Female	422	40324	39.2	34.39	44.26
Form					
Form 1	111	10502	23.2	18.87	28.12
Form 2	140	12943	29.2	23.76	35.30
Form 3	107	12455	30.4	24.70	36.67
Form 4	144	13506	35.1	29.01	41.82
Form 5	119	12052	31.7	25.63	38.56
Ethnicity					
Malay	177	17200	26.2	20.98	32.09
Chinese	34	2994	19.7	16.12	23.87
Indian	3	-	-	-	-
Bumiputera Sabah	340	34117	33.0	28.26	38.20
Bumiputera Sarawak	8	-	-	-	-
Others	59	6122	31.5	22.84	41.62

- Prevalence with high RSE, not reported

3.8 Physical Activity

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3.8.1 Introduction

World Health Organization (WHO) defines physical activity as any bodily movement produced by skeletal muscles that require energy expenditure.[1] Based on WHO, at least 60 minutes per day of moderate-to-vigorous intensity physical activity were recommended for children and adolescents aged 5–17 years.[1] Sufficient physical activity has substantial health benefits for children and adolescents in terms of improving cardio-metabolic health, better musculoskeletal health, increased psychosocial well-being, and academic performance.[2] Despite these established benefits, a substantial proportion of young people fail to meet physical activity guidelines. In addition, adolescents are also exposed to sedentary behaviours, as most of them spend greater time engaged in recreational activities, such as screen-based entertainment and digital communications.[3] Agenda National Malaysia Sihat (ANMS) and National Strategic Plan for Active Living (NASPAL) targeted to increase the adoption of healthy lifestyles among Malaysians which includes reducing the prevalence of physical inactivity among the general population, including adolescents by 10% within 10 years of implementation.[4] Thus, this study will provide more information regarding physical activity among adolescents in Sabah.

3.8.2 Objectives

i. To identify the prevalence of being physically active for a total of at least 60 minutes daily for five days or more in the past seven days among adolescents in Sabah
ii. To identify the prevalence of active transportation or commuting among adolescents in Sabah
iii. To identify the prevalence of sitting behavior among adolescents in Sabah

3.8.3 Variable Definitions

- **Physically active**: physically active for at least 60 minutes per day, for a minimum of five days per week (sum of all the time spent in any kind of physical activity each day).
- **Active transportation/ commuting**: walking or riding a bicycle for at least three days a week to or from school.
- **Sitting behaviour**: Spending time sitting for 3 hours or more in a typical or usual day for leisure activities such as watching television, playing computer games, talking with friends, or surfing the internet.

3.8.4 Findings

Physically active

The prevalence of being physically active was 19.6% (95% CI: 16.65, 22.87), among adolescents in Sabah. The prevalence was significantly higher in males [26.7% (95% CI: 22.32, 31.49)] than in females [12.5% (95% CI: 9.81, 15.67)] **(Table 3.8.1)**.

Active Transportation / Commuting

Overall, 27.8% (95% CI: 23.13, 33.07) adolescents reported active transportation to school. The prevalence was higher in males [29.6% (95% CI: 24.63, 35.16)] compared to females **(Table 3.8.2)**.

Sitting behaviour

A total of 59.1% (95% CI: 52.70, 65.13) had spent at least three hours in a typical or usual day engaging in sitting activities. The higher prevalence was observed in females [60.1% (95% CI: 51.80, 67.78)] compared to males **(Table 3.8.3)**.

3.8.5 Discussion / Conclusion

The prevalence of being physically active among school adolescents in Sabah was lower than national findings (19.6% vs. 21.4%). The prevalence of active commuting in Sabah was higher than national findings (27.8% vs. 27.0%). In addition, the prevalence of sitting behaviour was lower than the national finding (59.1% vs. 66.7%). Compared to previous NHMS findings, the prevalence of being physically active in the current study was higher than in the previous Sabah AHS 2017 (19.6% vs. 18.4%). The prevalence of sitting behaviour increased from 2012 to the current survey (42.3% in 2012, 43.1% in 2017, and 59.1% in 2022).

3.8.6 Recommendations

A comprehensive, integrated, intersectoral approach is required to increase the prevalence of physical activity among secondary school adolescents. Those initiatives and collaborative efforts jointly implemented across diverse ministries, agencies, private sectors, and civil service societies seem very effective, realizing that the social determinants of active living are beyond the health sectors. The recommendations are as below:

1. To explore more behavioral science and behavioral insights into physical inactivity and sedentary behavior among adolescents in Sabah to help us to design evidence-based health promotion and education initiatives with underlying effective 'nudging' techniques.

2. To examine the association between the frequency of use of online-related behaviors (time spent on social media, online communication, and e-games) with a sufficient level of physical activity and sedentary behavior in a more specific manner.
3. To include parents in the interventions and health promotion programs on physical activity among adolescents to encourage and support their children's participation in physical activity.

Table: Physical Activity trend in Sabah

	NHMS 2012	NHMS 2017	NHMS 2022
Physical activity	*21.0%	18.4%	19.6%
Active commuting	-	-	27.8%
Sitting behavior	*42.3%	43.1%	59.1%

* Included WP Labuan

3.8.7 References

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Table 3.8.1: Prevalence of being physically active (at least 60 minutes daily) for a total of 5 days or more in the past 7 days in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
SABAH	398	40430	19.6	16.65	22.87
Sex					
Male	263	27614	26.7	22.32	31.49
Female	135	12816	12.5	9.81	15.67
Form					
Form 1	72	6988	15.5	12.34	19.38
Form 2	81	8092	18.4	13.80	24.05
Form 3	69	7548	18.3	13.99	23.68
Form 4	80	7826	20.4	15.15	26.81
Form 5	96	9976	26.3	19.05	35.06
Ethnicity					
Malay	112	11344	17.4	13.62	21.93
Chinese	25	2364	15.6	10.00	23.41
Indian	2	-	-	-	-
Bumiputera Sabah	215	22017	21.3	17.56	25.64
Bumiputera Sarawak	4	-	-	-	-
Others	40	4146	21.3	16.55	27.09

- Prevalence with high RSE, not reported

Table 3.8.2: Prevalence of active commuting to school (walk or ride a bicycle to or from school for at least 3 days or more in the past 7 days) in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
SABAH	567	57409	27.8	23.13	33.07
Sex					
Male	291	30631	29.6	24.63	35.16
Female	276	26779	26.0	19.91	33.21
Form					
Form 1	118	11485	25.6	19.05	33.46
Form 2	128	12334	28.1	18.58	40.07
Form 3	111	12669	30.8	24.89	37.39
Form 4	86	8247	21.5	15.82	28.43
Form 5	124	12674	33.4	28.22	38.98
Ethnicity					
Malay	173	17653	27.1	20.57	34.69
Chinese	17	1519	10.0	7.39	13.39
Indian	2	-	-	-	-
Bumiputera Sabah	317	32042	31.1	25.54	37.18
Bumiputera Sarawak	3	-	-	-	-
Others	55	5687	29.5	20.76	39.96

- Prevalence with high RSE, not reported

Table 3.8.3: Prevalence of spending at least 3 hours in sitting activities in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
SABAH	1227	121806	59.1	52.70	65.13
Sex					
Male	577	60035	58.1	51.79	64.10
Female	650	61771	60.1	51.80	67.78
Form					
Form 1	215	20574	45.7	36.47	55.32
Form 2	275	25981	59.3	48.73	69.04
Form 3	213	24184	58.9	50.83	66.57
Form 4	276	25980	67.6	56.33	77.15
Form 5	248	25088	66.1	59.46	72.12
Ethnicity					
Malay	322	31883	48.9	40.05	57.75
Chinese	127	11195	73.7	65.66	80.39
Indian	6	662	49.9	24.95	74.87
Bumiputera Sabah	641	64736	62.8	57.71	67.54
Bumiputera Sarawak	15	1477	70.6	46.34	87.03
Others	116	11853	61.7	50.99	71.31

3.9 Protective Factors

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3.9.1 Introduction

Protective factors are individual or environmental characteristics or conditions that promote adolescent health and well-being[1]. The role of protective factors in adolescents is to improve the likelihood of positive health behaviours or outcomes (such as healthy diet, exercise, hygiene practices) and to reduce the negative impacts of risk factors (for example tobacco, alcohol and drug use, violence). Multiple protective factors at the school, peer and family levels can foster healthy behaviours and promote mental health[2]. At the school level, truancy is seen as an indicator that is monitored by lower prevalence, as truancy often acts as a precursor of many harmful behaviours. During adolescence, peer support and parental factors can be fundamental aspects of establishing positive health behaviours to prevent chronic diseases. In line with the strategies stated in the National Adolescent Health Policy, this study focuses on identifying protective factors at family, school, and peer levels that influence adolescent health and integrating these protective factors into health promotion among adolescents in Sabah.

3.9.2 Objectives

i. To determine the prevalence of truancy in the past 30 days among adolescents
ii. To determine the prevalence of peer support in the past 30 days among adolescents
iii. To determine the prevalence of parental or guardian supervision in the past 30 days among adolescents
iv. To determine the prevalence of parental or guardian connectedness in the past 30 days among adolescents
v. To determine the prevalence of parental or guardian bonding in the past 30 days among adolescents
vi. To determine the prevalence of parental or guardian respect for privacy in the past 30 days among adolescents

3.9.3 Variable definitions

- **Truancy:** Missed class or school without permission for at least one day in the past 30 days. (This variable is monitored with lower prevalence to define as protective factors).
- **Peer support:** Adolescents in their school were kind and helpful most of the time or always during the past 30 days.
- **Parental or guardian supervision:** Parents or guardians had always or most of the time, checked to see if their homework was done in the past 30 days.
- **Parental or guardian connectedness:** Parents or guardians had always or most of the time, understood their problems and worries in the past 30 days.
- **Parental or guardian bonding:** Parents or guardians had always or most of the time, really knew what they were doing with their free time in the past 30 days.
- **Parental or guardian respect for privacy:** Parents or guardians had never or rarely gone through their things without their approval in the past 30 days.

3.9.4 Findings

Truancy
The prevalence of truancy in the past 30 days among adolescents was 33.3% (95% CI: 28.66, 38.39). It was higher in females (34.0%, 95% CI: 28.28, 40.18) compared to males (32.7%, 95% CI: 27.09, 38.78). Truancy was highest among Form 5 students with 44.0% (95% CI: 38.62, 49.54) **(Table 3.9.1)**.

Having Peer Support
The prevalence of having peer support in the past 30 days among adolescents was 46.8% (95% CI: 42.61, 51.12). It was higher in females (54.1%, 95% CI: 49.69, 58.48) compared to males (39.1%, 95% CI: 33.90, 44.46). Having peer support was highest among Form 5 students with 55.1% (95% CI: 46.59, 63.35) **(Table 3.9.2)**.

Having Parental or Guardian Supervision
The prevalence of having parental or guardian supervision in the past 30 days among adolescents was 11.2% (95% CI: 9.31, 13.42). It was higher in males (13.4%, 95% CI: 10.80, 16.46) compared to females (9.2%, 95% CI: 7.26, 11.53). Having parental or guardian supervision was highest among Form 1 students with 16.3% (95% CI: 12.19, 21.36) **(Table 3.9.3)**.

Having Parental or Guardian Connectedness
The prevalence of having parental or guardian connectedness in the past 30 days among adolescents was 24.3% (95% CI: 21.36, 27.53). It was higher in males (28.0%, 95% CI: 23.98, 32.36) compared to females (20.9%, 95% CI: 17.06, 25.31). Having parental or guardian connectedness was highest among Form 2 students with 27.7% (95% CI: 21.51, 34.96). **(Table 3.9.4)**.

Having Parental or Guardian Bonding
The prevalence of having parental or guardian bonding in the past 30 days among adolescents was 31.5% (95% CI: 28.94, 34.19). It was higher in males (34.5%, 95% CI: 30.42, 38.92) compared to females (28.7%, 95% CI: 25.90, 31.65). Having parental or guardian bonding was highest among Form 5 students with 36.3% (95% CI: 33.34, 39.43) **(Table 3.9.5)**.

Having Parental or Guardian Respect for Privacy

The prevalence of having parental or guardian respect for privacy in the past 30 days among adolescents was 79.9% (95% CI: 78.02, 81.62). It was higher in females (81.2%, 95% CI: 78.22, 83.80) compared to males (78.5%, 95% CI: 75.63, 81.08). Having parental or guardian respect for privacy was highest among Form 4 students with 83.1% (95% CI: 75.95, 88.40) **(Table 3.9.6)**.

3.9.5 Discussion / Conclusion

Parental protective factors which were parent or guardian supervision, connectedness and bonding showed a decreasing trend. This is quite worrisome because parent/guardian-adolescent relation is a strong protective factor by providing a secure base for them especially in social support and might determine their children's lives and behaviour during adolescence. Therefore, a comprehensive intervention policies or programmes must be further designed to address and to tackle this issue.

3.9.6 Recommendations

Development of interventions that strengthen the protective factors among school adolescents is important and more effective in reducing risk in order to improve the outcomes experienced by the adolescents. Among the interventions that can be implemented are:

1. Monitoring attendance closely by participation of schools, parent and local organizations through enforcement of mandatory attendance law allows identification of at risk and truancy behaviour among school adolescents.
2. Establishment of school programs that need parent's supervision will help in improving the parenting skills especially in parental attachment.

Table: Protective Factors Trend in Sabah

	NHMS 2012	NHMS 2017	NHMS 2022
Truancy	32.7	35.6	33.3
Having peer support	50.6	44.5	46.8
Having parental or guardian supervision	14.3	15.0	11.2
Having parental or guardian connectedness	30.6	32.4	24.3
Having parental or guardian bonding	37.5	37.3	31.5
Having parental or guardian respect for privacy	73.9	71.0	84.0

3.9.7 References

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Table 3.9.1: Prevalence of truancy in the past 30 days among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
SABAH	623	63354	33.3	28.66	38.39
Sex					
Male	284	29986	32.7	27.09	38.78
Female	339	33368	34.0	28.28	40.18
Form					
Form 1	84	8108	20.6	13.35	30.42
Form 2	124	11877	29.6	22.97	37.30
Form 3	121	14204	37.8	30.14	46.21
Form 4	131	12597	35.6	25.69	46.91
Form 5	163	16568	44.0	38.62	49.54
Ethnicity					
Malay	195	19368	35.0	28.74	41.78
Chinese	14	-	-	-	-
Indian	4	-	-	-	-
Bumiputera Sabah	346	35692	36.5	32.72	40.42
Bumiputera Sarawak	8	802	38.3	21.93	57.89
Others	56	5812	31.5	25.02	38.67

- Prevalence with high RSE, not reported

Table 3.9.2: Prevalence of having peer support in the past 30 days among adolescents' students in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
SABAH	899	88757	46.8	42.61	51.12
Sex					
Male	343	35757	39.1	33.90	44.46
Female	556	53000	54.1	49.69	58.48
Form					
Form 1	164	15526	39.5	32.46	47.07
Form 2	190	17565	44.0	37.07	51.27
Form 3	152	17435	46.6	38.31	55.04
Form 4	187	17481	49.6	40.40	58.75
Form 5	206	20750	55.1	46.59	63.35
Ethnicity					
Malay	239	23119	41.7	33.52	50.46
Chinese	67	5985	39.9	33.41	46.78
Indian	6	651	53.5	23.47	81.25
Bumiputera Sabah	502	50547	51.9	47.32	56.38
Bumiputera Sarawak	11	1043	49.9	31.48	68.28
Others	74	7413	40.4	33.87	47.21

- Prevalence with high RSE, not reported

Table 3.9.3: Prevalence of having parental or guardian supervision in the past 30 days among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
SABAH	217	21219	11.2	9.31	13.42
Sex					
Male	120	12223	13.4	10.80	16.46
Female	97	8996	9.2	7.26	11.53
Form					
Form 1	68	6354	16.3	12.19	21.36
Form 2	58	5518	13.8	9.67	19.41
Form 3	35	3838	10.3	6.85	15.08
Form 4	25	2346	6.6	4.63	9.40
Form 5	31	3163	8.4	5.05	13.66
Ethnicity					
Malay	83	8152	14.7	10.75	19.83
Chinese	24	2147	14.4	10.15	20.05
Indian	0	-	-	-	-
Bumiputera Sabah	93	9231	9.5	7.30	12.20
Bumiputera Sarawak	3	-	-	-	-
Others	14	1378	7.5	5.28	10.55

- Prevalence with high RSE, not reported

Table 3.9.4: Prevalence of having parental or guardian connectedness in the past 30 days among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
SABAH	465	46011	24.3	21.36	27.53
Sex					
Male	245	25562	28.0	23.98	32.36
Female	220	20449	20.9	17.06	25.31
Form					
Form 1	103	9591	24.5	18.68	31.54
Form 2	114	11014	27.7	21.51	34.96
Form 3	76	8404	22.5	18.27	27.28
Form 4	79	7408	20.9	15.79	27.22
Form 5	93	9594	25.5	20.08	31.77
Ethnicity					
Malay	150	14875	26.9	22.53	31.78
Chinese	39	3456	23.2	20.21	26.42
Indian	2	-	-	-	-
Bumiputera Sabah	222	22307	22.9	19.46	26.72
Bumiputera Sarawak	5	-	-	-	-
Others	47	4706	25.7	19.39	33.31

- Prevalence with high RSE, not reported

Table 3.9.5: Prevalence of having parental or guardian bonding in the past 30 days among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
SABAH	596	59486	31.5	28.94	34.19
Sex					
Male	302	31354	34.5	30.42	38.92
Female	294	28132	28.7	25.90	31.65
Form					
Form 1	122	11734	30.2	24.27	36.95
Form 2	134	12707	31.9	27.02	37.13
Form 3	99	11287	30.3	24.47	36.92
Form 4	108	10123	28.6	23.15	34.77
Form 5	133	13635	36.3	33.34	39.43
Ethnicity					
Malay	161	15975	29.0	24.06	34.49
Chinese	58	5252	35.2	27.43	43.93
Indian	2	-	-	-	-
Bumiputera Sabah	322	32667	33.6	31.59	35.64
Bumiputera Sarawak	7	715	36.1	19.86	56.26
Others	46	4604	25.1	19.68	31.36

- Prevalence with high RSE, not reported

Table 3.9.6: Prevalence of having parental or guardian respect for privacy in the past 30 days among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
SABAH	1526	150728	79.9	78.02	81.62
Sex					
Male	686	71142	78.5	75.63	81.08
Female	840	79586	81.2	78.22	83.80
Form					
Form 1	327	30851	79.3	75.17	82.91
Form 2	335	31463	79.1	74.51	83.09
Form 3	256	28943	77.8	73.52	81.54
Form 4	309	29396	83.1	75.95	88.40
Form 5	299	30076	80.3	75.68	84.27
Ethnicity					
Malay	445	43279	78.6	74.49	82.16
Chinese	134	12018	80.8	74.42	85.82
Indian	10	1053	86.7	37.38	98.61
Bumiputera Sabah	789	79449	81.8	78.88	84.32
Bumiputera Sarawak	14	1351	68.1	49.53	82.34
Others	134	13578	73.9	67.24	79.67

- Prevalence with high RSE, not reported

3.10 Sexual Behaviours

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3.10.1 Introduction

Adolescent sexual behaviour contributes to various sexual and reproductive health issues. The Global Summary HIV Epidemic Report, there were 150,000 adolescents aged 10-19 that were newly infected with HIV while 1,750,000 adolescents were already living with HIV[1]. It was also reported that the highest rate of sexual transmitted illness (STI) worldwide is among young people aged 15 to 24 years[2]. In Malaysia, the incidence of HIV reported among adolescents aged 13 to 19 was 2.4 per 100,000 population in 2021 and this trend has been steadily increasing in the past 10 years[2]. The WHO reported that 50% of young unmarried girls aged 15 to 19 years in low- and middle-income countries had an unintended pregnancy in 2019[3]. Globally, there were 41 births per 1000 girls aged 15-19 years in 2020 and 14% of maternal deaths. Good knowledge of HIV would help in reducing the transmission as shown in a study that a person with inadequate knowledge of HIV is more vulnerable to acquire the infection and may spread the disease throughout the population[4]. Good knowledge on HIV transmission was also associated with intention to engage in low-risk sexual behaviour[5]. Therefore, this study also aims to assess the knowledge of HIV transmission based on United Nation General Assembly Special Session (UNGASS) indicators among the school adolescents to determine the prevalence of HIV knowledge among them.

3.10.2 Objectives

To determine:

i. the prevalence of ever having sexual intercourse among adolescents in Malaysia
ii. the prevalence of current sexual intercourse in the past 30 days among adolescents in Malaysia
iii. the percentage of first sexual experience before the age 14 years among those who ever had sex
iv. the percentage of having at least two sexual partners among those who ever had sex
v. the percentage of condom usage during the last sexual intercourse among those who ever had sex
vi. the percentage of "other birth control methods" usage during the last sexual intercourse among those who ever had sex
vii. the prevalence of adequate HIV knowledge among adolescents in Malaysia
viii. the percentage of correct responses in each of UNGASS indicators among adolescents in Malaysia

3.10.3 Variable Definitions

- **Sexual intercourse**: sexual acts of penile penetration into the vagina or anus.
- **Risky sexual behaviour**: behaviours such as early sex debut, multiple sex partners and unprotected sex that could lead to health problems.
- **Other birth control methods**: pregnancy prevention methods other than barrier methods (condom usage) including withdrawal, birth control pills or any other non-barrier methods.
- **Ever had sex**: any positive answer for first sexual intercourse.
- **Current sexual intercourse**: sexual intercourse in the past 30 days.
- **Adequate HIV Knowledge**: provided correct responses to all five items of UNGASS indicators/ questions.

3.10.4 Findings

Prevalence of ever had sex among adolescents in Sabah was 6.8% (95% CI: 4.85, 9.43), male adolescents showed significantly higher prevalence 8.7% (95% CI: 6.00, 12.35) compared to females, 5.1% (95% CI: 3.12, 8.14) **(Table 3.10.1)**. Prevalence of current sexual intercourse among adolescents in Sabah was 4.9% (95% CI: 3.45, 6.93), male adolescents had higher prevalence of currently having sexual intercourse which was 6.0% (95% CI: 4.15, 8.74) compared to female; 3.9% (95% CI: 2.16, 6.79) **(Table 3.10.2)**. Of those who ever had sex, 30.8% had sex before the age of 14. It was noted that 12.9% of them used other birth control methods and 11.9% those who had at least two sexual partners. While 5.9% used condom during their last sexual intercourse **(Table 3.10.3)**.

The percentage of correct responses by each item was highest for question "Can a healthy-looking person have HIV?" with 20.9%. "Can a person get HIV from mosquito bites?" with percentage 20.4%. Followed by question %. "Can a person get HIV by sharing food with someone who is infected?" the percentage was 15.0%. "Can a person reduce the risk of getting HIV using a condom every time they have sex?" the percentage was 12.0%. While the least 11.0% for "Can the risk of HIV transmission be reduced by having sex with only one uninfected partner who has no other partner?. **(Table 3.10.4)**

3.10.5 Discussion / Conclusion

This study found that majority of sexually active adolescents are engaging in risky sexual behaviour, i.e., sex debut before age 14 years, having multiple sexual partners and unprotected sex. While from the UNGASS indicators, adequate knowledge on HIV transmission among adolescents are still low.

3.10.6 Recommendations

1. To strengthen sexual and reproductive health education to be more effective and comprehensive in empowering adolescents with appropriate knowledge, attitude, and skills.
2. To enhance the promotion of various existing sexual and reproductive health modules designed to guide and assist parents / guardians / caregivers to talk about sexuality at home and institutions.
3. To improve on parenting skills and effective communication in sexual and reproductive health related matters.
4. To conduct more studies especially qualitative studies in exploring the determinants of risky sexual behaviours among adolescents.
5. To reactivate the Healthy Programme Without AIDS for Adolescents (PROSTAR) to increase HIV/STI awareness and knowledge.
6. To utilise creative and innovative approaches through social media, peer educator programmes, public-private-NGO (triparty) partnerships and etc.
7. To utilise creative and innovative approaches through social media, peer educator programmes, public-private-NGO (triparty) partnerships and etc.

3.10.7 References

1. HIV and AIDS in adolescents. Unicef Data. 2021 https://data.unicef.org/ topic/hivaids/#:~:text=Globally%2C%20 adolescents%20 10%2D19%20years, of%20all%20 AIDS%2Drelated%20deaths
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5. Satterwhite CL, Torrone E, Meites E, Dunne EF, Mahajan R, Ocfemia MC, et al. Sexually transmitted infections among US women and men: prevalence and incidence estimates, 2008. Sex Transm Dis. 2013;40(3):187-93

Table 3.10.1: Prevalence of ever had sexual intercourse among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
SABAH	125	12747	6.8	4.85	9.43
Sex					
Male	74	7791	8.7	6.00	12.35
Female	51	4956	5.1	3.12	8.14
Form					
Form 1	39	3778	9.9	5.64	16.64
Form 2	33	3217	8.1	4.29	14.78
Form 3	23	2663	7.2	4.46	11.36
Form 4	12	-	-	-	-
Form 5	18	-	-	-	-
Ethnicity					
Malay	52	5210	9.5	5.37	16.35
Chinese	11	1015	6.8	3.84	11.83
Indian	0	-	-	-	-
Bumiputera Sabah	47	4999	5.2	3.06	8.64
Bumiputera Sarawak	2	-	-	-	-
Others	13	1322	7.2	4.12	12.14

- Prevalence with high RSE, not reported

Table 3.10.2: Prevalence of current sexual intercourse in the past 30 days among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
SABAH	90	9210	4.9	3.45	6.93
Sex					
Male	52	5441	6.0	4.15	8.74
Female	38	3769	3.9	2.16	6.79
Form					
Form 1	28	2746	7.2	3.77	13.19
Form 2	25	-	-	-	-
Form 3	20	2323	6.3	3.63	10.60
Form 4	6	-	-	-	-
Form 5	11	-	-	-	-
Ethnicity					
Malay	38	3755	6.9	3.76	12.22
Chinese	7	642	4.3	2.51	7.31
Indian	0	-	-	-	-
Bumiputera Sabah	32	3476	3.6	2.15	5.97
Bumiputera Sarawak	2	-	-	-	-
Others	11	-	-	-	-

- Prevalence with high RSE, not reported

Table 3.10.3: Proportion of sexual practices among those who ever had sex among adolescents in Sabah, 2022

Sexual Practices	Unweighted count	Percentage (%)
Percentage of first sex before the age 14 years	39	30.8
Percentage of having at least two sexual partners	15	11.9
Percentage of reported condom use during last sexual intercourse	8	5.9
Percentage of reported using other birth control method during last sexual intercourse	17	12.9

Table 3.10.4: Percentage of Correct Responses by item of UNGASS Indicator among adolescents in Sabah, 2022

Sexual Practices	Unweighted count	Percentage (%)
Can the risk of HIV transmission be reduced by having sex with only one uninfected partner who has no other partners?	232	11.0
Can a person reduce the risk of getting HIV using a condom every time they have sex?	257	12.0
Can a healthy-looking person have HIV?	446	20.9
Can a person get HIV from mosquito bites?	431	20.4
Can a person get HIV by sharing food with someone who is infected?	311	15.0

3.11 Tobacco Use

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3.11.1 Introduction

Tobacco use including cigarette and e-cig/vape is predominantly an issue for male adolescents. Malaysia is committed to achieve smoke free generation by 2040[1]. Various anti-tobacco programs for youths have been established especially at school level. Continuous surveillance of tobacco use among adolescents is essential in monitoring the progress of tobacco control programs in Malaysia generally and at state level of Sabah, specifically.

3.11.2 Objectives

General objective:

To determine the use of tobacco among adolescents in Sabah.

Specific objectives:

i. To identify the prevalence of the current use of any tobacco product adolescents in Sabah
ii. To identify the prevalence of the current tobacco smoking (current smoking) among adolescent in Sabah
iii. To identify the prevalence of the current cigarette smoking among adolescent in Sabah
iv. To identify the prevalence of the current e-cig/vape use among adolescent in Sabah
v. To determine the latest source of cigarette obtained among adolescent cigarette smokers in Sabah
vi. To determine the latest source of e-cig/vape obtained among adolescent e-cig/vape users in Sabah
vii. To determine the prevalence of exposure to second-hand smoke among adolescent in Sabah
viii. To determine the prevalence of exposure to tobacco products advertisement or promotion in the point of sales among adolescents in Sabah

3.11.3 Variable Definitions

- **Current any tobacco use** - the use any of the following tobacco product during the last 30 days: manufactured cigarette, traditional hand rolled cigarettes, roll-your-own cigarettes with cigarette papers, cigar/cigarillos, tobacco pipe (pipe smoking), shisha/hookah, electronic cigarette/ vape, heated tobacco product, snuff or chewed tobacco
- **Current tobacco smoker or current smoker** - the use of any of the following tobacco products during the last 30 days: manufactured cigarette, traditional hand rolled cigarettes, roll-your-own cigarettes with cigarette papers, cigar/cigarillos, tobacco pipe (pipe smoking) or shisha/hookah
- **Current cigarette smoker** - the use of any of the following tobacco products during the last 30 days: manufactured cigarettes, traditional hand rolled cigarettes, roll-your-own cigarettes with cigarette papers or cigar/cigarillos
- **Current e-cig/vape user** - the use of e-cig/vape during the last 30 days

3.11.4 Findings

In Sabah, the prevalence of current use of any tobacco products was 23.0% (95%CI: 18.83, 27.78), which was above the national prevalence [18.5% (95%CI: 17.09, 19.92)]. The prevalence of males was more than two and half times higher [33.3% (95%CI: 27.34, 39.92)] as compared to females [12.7% (95%CI: 10.07, 15.88)] **(Table 3.11.1)**. The prevalence of current smokers in Sabah was 12.2% (95%CI: 9.41, 15.73) with males dominating the prevalence for slightly three times higher as compared to females [18.5% (95%CI: 13.74, 24.49) vs. 5.9% (95%CI: 4.41, 7.94)] **(Table 3.11.2)**, while the current cigarette smoker prevalence was 8.6% (95%CI: 6.34, 11.67) **(Table 3.11.3)**. The prevalence of the current e-cig/vape user among adolescents in Sabah was 19.0 (95%CI: 15.50, 23.12) with the prevalence of males was almost three times higher compared to females [28.3% (95%CI: 22.90, 34.50) vs. 9.7% (95%CI: 7.60, 12.40)] **(Table 3.11.4)**.

Most of the cigarettes obtained by getting them from friends (32.3%) and by buying them from static premises (30.0%) as well as from non-static premises (15.0%) **(Table 3.11.5)**. Most of the e-cig/vape were obtained by getting them from friends (39.1%), by buying them from specific e-cig/vape shops (25.4%) and through a family member (12.3%) **(Table 3.11.6)**. Nearly half of the adolescents reported they have parent or guardian who smoked or used any type of tobacco products [42.3% (95%CI: 36.89, 47.82)] and reported they were exposed to second-hand smoke when someone else smoking nearby in their presence within the past 7 days [44.0% (95%CI: 39.73, 48.32)], with one-fifth [22.3% (95%CI: 18.67, 26.31)] reported they have e-cig/vape used parent or guardians **(Table 3.11.7)**. Nearly one-fifth of the adolescents claimed they were exposed to the tobacco products point-of-sale advertising and promotion for the past 30 days [18.3% (95%CI: 16.16, 20.71)] **(Table 3.11.8)**.

3.11.5 Discussion / Conclusion

The prevalence of tobacco use among adolescents in Sabah just has some narrow difference as compared with the prevalence in Malaysia. There was a significant increase in the prevalence of e-cig/vape use among adolescents, as compared with findings in 2017[2]. This indicates a switch in the preference of nicotine delivery among adolescents in Malaysia, as well as in Sabah within the past five years. Various factors could have contributed to these recent findings. Special concern should also be given to female adolescents as the prevalence of e-cig/vape users has doubled since 2017[2].

3.11.6 Recommendation

Tobacco use, which includes vaping, is a major harmful determinant for human health. It is worrying that the current anti-tobacco programs seem to have not diminished Malaysian adolescents' interest in vaping. A smokefree generation requires participation and dedication from all sectors, including family institutions, education sector, politicians, government and non-governmental organizations. Moving forward, it is high time for all sectors to come together and agree on banning tobacco use among future Malaysian generations. Strengthening the current law and taking legal action are vital in controlling the accessibility of tobacco products, especially e-cig/vape by adolescents. For those who have developed a nicotine addiction, the visibility of quit smoking services should be increased more aggressively to attract more adolescents to seek help. All screening, prevention, and intervention programs among adolescents must be strengthened and delivered in synergy by all governmental and nongovernmental agencies.

3.11.7 References

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2. Institute for Public Health (IPH). 2017. National Health and Morbidity Survey, NHMS 2017. Ministry of Health Malaysia

Table 3.11.1: Prevalence of current tobacco use among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
SABAH	453	46704	23.0	18.83	27.78
Sex					
Male	320	33804	33.3	27.34	39.92
Female	133	12901	12.7	10.07	15.88
Form					
Form 1	81	7823	17.7	12.41	24.64
Form 2	85	8323	19.5	14.21	26.17
Form 3	96	10743	26.9	21.17	33.56
Form 4	89	8993	23.5	15.17	34.45
Form 5	102	10822	28.5	18.98	40.43
Ethnicity					
Malay	172	17440	27.6	21.36	34.88
Chinese	19	-	-	-	-
Indian	3	-	-	-	-
Bumiputera Sabah	202	21081	20.6	16.71	25.20
Bumiputera Sarawak	3	-	-	-	-
Others	54	5773	30.2	23.25	38.19

- Prevalence with high RSE, not reported

Table 3.11.2: Prevalence of current tobacco smoker among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
SABAH	239	24815	12.2	9.41	15.73
Sex					
Male	177	18781	18.5	13.74	24.49
Female	62	6034	5.9	4.41	7.94
Form					
Form 1	49	4773	10.8	6.76	16.84
Form 2	49	4878	11.4	7.19	17.71
Form 3	52	5777	14.5	9.69	21.08
Form 4	42	4324	11.3	6.82	18.10
Form 5	47	5063	13.3	7.06	23.76
Ethnicity					
Malay	96	9848	15.6	10.80	21.99
Chinese	12	1117	7.4	4.01	13.11
Indian	0	-	-	-	-
Bumiputera Sabah	104	10860	10.6	7.68	14.54
Bumiputera Sarawak	1	-	-	-	-
Others	26	2881	15.1	9.15	23.84

- Prevalence with high RSE, not reported

Table 3.11.3: Prevalence of current cigarette smoker among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
SABAH	169	17529	8.6	6.34	11.67
Sex					
Male	131	13848	13.7	9.78	18.78
Female	38	3682	3.6	2.39	5.47
Form					
Form 1	30	2872	6.5	4.32	9.68
Form 2	32	3210	7.5	4.61	12.05
Form 3	39	4294	10.8	7.36	15.47
Form 4	30	3088	8.1	4.55	13.92
Form 5	38	-	-	-	-
Ethnicity					
Malay	64	6605	10.5	6.73	15.89
Chinese	7	-	-	-	-
Indian	0	-	-	-	-
Bumiputera Sabah	80	8335	8.2	5.66	11.65
Bumiputera Sarawak	0	-	-	-	-
Others	18	1935	10.1	6.04	16.48

- Prevalence with high RSE, not reported

Table 3.11.4: Prevalence of current e-cigarette/vape use among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
SABAH	371	38578	19.0	15.50	23.12
Sex					
Male	271	28669	28.3	22.9	34.5
Female	100	9909	9.7	7.6	12.4
Form					
Form 1	58	5621	12.7	8.7	18.2
Form 2	64	6266	14.8	10.8	19.9
Form 3	88	9880	24.8	19.2	31.3
Form 4	74	7534	19.7	12.7	29.2
Form 5	87	9277	24.4	16.3	35.0
Ethnicity					
Malay	142	14503	23.0	17.3	29.9
Chinese	12	-	-	-	-
Indian	3	-	-	-	-
Bumiputera Sabah	170	17822	17.5	14.3	21.1
Bumiputera Sarawak	2	-	-	-	-
Others	42	4577	23.9	17.9	31.2

- Prevalence with high RSE, not reported

Table 3.11.5: Proportion of source of cigarette obtaining during the last time smoking in the past 30 days among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Percentage (%)
Bought from static premises	55	30.0
Bought from non-static premises	28	15.0
Food establishment	5	-
Bought online	5	-
Get from friends	60	32.3
Get from family members	17	9.1
Got some other ways	16	5.4

- Prevalence with high RSE, not reported

Table 3.11.6: Proportion of source of e-cigarette/vape obtaining during the last time using e-cig/vape in the past 30 days among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Percentage (%)
Bought from static premises	78	25.4
Bought from non-static premises	13	-
Food establishment	16	5.1
Bought online	26	8.6
Get from friends	119	39.1
Get from family members	39	12.3
Got some other ways	16	5.4

- Prevalence with high RSE, not reported

Table 3.11.7: Prevalence of exposure to second hand smoke among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
Having parent or guardian who smoked or used any tobacco products	785	79277	42.3	36.89	47.82
Having e-cigarette/vape use parent or guardian	417	42168	22.3	18.67	26.31
Exposure to second hand smoke in the past 7 days	879	88916	44.0	39.73	48.32

Table 3.11.8: Proportion of currently see or notice any tobacco products advertising or promotion in the past 30 days among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
Currently see or notice any tobacco product advertising or promotion in the point of sales in the past 30 days	370	36931	18.3	16.16	20.71

3.12 Violence and Unintentional Injury

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3.12.1 Introduction

Malaysia supports the mandate under resolutions WHA67.15 (2014) and WHA69.5 (2016) on implementing the WHO global plan of action to strengthen the role of the health system within a national multisectoral response to address interpersonal violence in particular against women and girls, and against children. Global school-based health surveys have shown that up to 42% of adolescent boys and 37% of adolescent girls were exposed to bullying[1]. Due to lockdowns caused by the ongoing COVID-19 pandemic, adolescents may be subjected to mistreatment and violence when they are forced to remain at home with their aggressors[2]. In addition, cyberbullying is another issue of concern that is closely related to adolescents' mental health and development[3].

3.12.2 Objectives

To describe the prevalence of:

i. Having been physically attacked at least once in the past 12 months
ii. Involvement in a physical fight at least once in the past 12 months
iii. Having had a serious injury at least once in the past 12 months
iv. Physical abuse at home at least once in the past 30 days
v. Verbal abuse at home at least once in the past 30 days
vi. Having been bullied at least once in the past 30 days
vii. Involvement in the perpetration of cyberbullying a few times within a year or more

3.12.3 Variable Definitions

- **Physical attack**: when one or more persons hurt another person with or without a weapon such as sticks or knives in the past 12 months. It is NOT a physical attack when two individuals or adolescents of about the same strength or power choose to fight each other.
- **Physical fight**: when two individuals or adolescents of about the same strength or power choose to fight each other in the past 12 months.
- **Unintentional injury**: a serious injury which makes the student miss at least one full day of usual activity (such as school, sports or a job) OR requires treatment by doctor or medical personnel in the past 12 months.
- **Physical abuse at home**: when someone is hit so hard that it left a mark OR caused an injury in the past 30 days.
- **Verbal abuse at home**: when someone has had hurtful or insulting things said to them in the past 30 days.
- **Bullying**: when a student or group of adolescents say or do bad and unpleasant things to another student, such as teasing a lot in an unpleasant way or leaving out things on purpose in the past 30 days. It is NOT bullying when two adolescents of about the same strength or power argue or fight or when teasing is done in a friendly and fun way.
- **Cyberbullying (perpetrator)**: bullying or harassment through the internet, cell phones, or other electronic devices (ie, sending insulting messages, posting digitally altered photos, engaging in online fighting, making aggressive comments, sharing someone's embarrassing information, or sending messages that include threats of harm through e-mail, instant messaging, in a chat room, on a website, or sent to a cell phone).

3.12.4 Findings

The prevalence of adolescents who had been physically attacked in the past 12 months was 16.6% (95% CI: 14.44, 19.03) and this was higher in male [17.3% (95% CI: 14.53, 20.49)] compared to female [16% (95% CI: 13.33, 18.98)]. (Table 3.12.1). Overall, 19.3% (95% CI: 16.89, 22.00) adolescents claimed to have been involved in a physical fight, which was higher in male [20.1% (95% CI: 16.84, 23.91)] compared to female [18.5% (95% CI: 15.44, 22.07)]. **(Table 3.12.1)**.

The prevalence of adolescents who had a serious injury in the past 12 months was 22% (95% CI: 19.25, 24.98). Male adolescents showed a higher prevalence [24.9% (95% CI: 21.11, 29.06)] compared to female [19.2% (95% CI: 16.57, 22.21)]. **(Table 3.12.2)**. However, among those who had been seriously injured, the two most common causes of serious injury were falls [8.3% (95% CI: 6.45, 10.69)] and motor vehicle accidents [3.2% (95% CI: 1.89, 5.53)]. **(Table 3.12.3)**.

The prevalence of adolescents reported had experienced physical abuse at home was 10.1% (95% CI: 8.01, 12.69) which was higher among female at 11.3% (95% CI: 8.75, 14.35) compared to male at 8.9% (95% CI: 6.44, 12.20)]. (Table 3.12.4). Overall, 46% (95% CI: 41.50, 50.57) adolescents reported being abused verbally at home and it was significantly higher among female [59.9% (95% CI: 54.90, 64.70)] compared to male [31.3% (95% CI: 26.36, 36.64)]. **(Table 3.12.4)**.

In terms of bullying, 9.9% (95% CI: 8.26, 11.88) adolescents reported having been bullied. This was higher among female [10% (95% CI: 7.82, 12.82)] compared to male [9.8% (95% CI: 7.40, 12.85)]. **(Table 3.12.5)**. The most common

form of bullying was, 'Making fun of how my body or face looks' [1.9% (95% CI: 1.39, 2.63)]. **(Table 3.12.6)**.

With regards to involvement in cyberbullying activities from the perspective of the perpetrator, 18.9% (95% CI: 16.28, 21.90) of adolescents reported that they had been involved in cyberbullying activities a few times within the past year or more. Male adolescents showed a higher prevalence [21.7% (95% CI: 17.83, 26.20)] compared to female [16.1% (95% CI: 13.36, 19.27)]. **(Table 3.12.7)**. The two most common forms of adolescents' involvement in cyberbullying activities were 'Ever made rude comments to anyone online' [13.4% (95% CI: 11.26, 15.91)] and 'Ever spread rumours about someone online' [7.8% (95% CI: 6.66, 9.05)]. **(Table 3.12.8)**.

3.12.5 Discussion / Conclusion

Pandemic situations reduced the prevalence of violence significantly through restricted movement, reduced social exposure, and reduced exposure to physical violence. The prevalence of perpetration of cyberbullying found in this survey is consistent with only a few countries in the world. Despite the reduction in all domains, further strategic steps should be taken to improve the outcome of the survey.

3.12.6 Recommendations

In the previous two surveys, recommendations touched on identifying the risk factors that contributed to the problems. The recommendations in this survey are more focused on dealing with abuse, bullying, cyberbullying, and falling. Approaches should be comprehensive with the involvement of relevant agencies.

i. Promotion of "Bystander Revolution" as part of a bully cessation program, where adolescents are empowered to stop and report a bullying event.
ii. Awareness programmes for cyberbullying should now focus on the perpetrator, as there are already approaches to manage victims of cyberbully.
iii. In schools, life skills education and the implementation of programmes to strengthen the communication between adolescents and teachers.
iv. The overall approach to cyber safety emphasises media watch, written policies and laws to control media contents (violence acts and pornography) and enhancing tele-health and digitalization for accessibility to get help.

3.12.7 References

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Table 3.12.1: Prevalence of involvement in violence at least once in the past 12 months among adolescents in Sabah, 2022

Socio-demographic characteristics	Having been physically attacked at least once					Involvement in physical fight at least once				
	Unweighted count	Estimated population	Prevalence (%)	95 % CI		Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper				Lower	Upper
SABAH	325	32095	16.6	14.44	19.03	372	37300	19.3	16.89	22.00
Sex										
Male	158	16309	17.3	14.53	20.49	182	18966	20.1	16.84	23.91
Female	167	15786	16.0	13.33	18.98	190	18335	18.5	15.44	22.07
Form										
Form 1	79	7497	18.3	14.46	22.80	82	7828	19.1	14.11	25.26
Form 2	69	6569	16.1	12.47	20.52	86	8240	20.2	15.56	25.77
Form 3	64	7069	18.6	15.05	22.78	78	8824	23.3	20.11	26.80
Form 4	62	5784	16.2	12.59	20.61	69	6541	18.3	13.58	24.25
Form 5	51	5176	13.7	9.28	19.90	57	5868	15.6	11.77	20.36
Ethnicity										
Malay	108	10599	18.5	14.19	23.84	121	12045	21.1	17.52	25.20
Chinese	35	3091	20.6	16.37	25.62	25	2207	14.7	10.37	20.47
Indian	2	-	-	-	-	2	-	-	-	-
Bumiputera Sabah	134	13619	13.7	11.17	16.75	173	17703	17.8	15.22	20.80
Bumiputera Sarawak	5	-	-	-	-	4	-	-	-	-
Others	41	4138	22.4	16.64	29.43	47	4780	25.9	21.13	31.25

- Prevalence with high RSE, not reported

Table 3.12.2: Prevalence of had serious injury at least once in the past 12 months among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
SABAH	428	42392	22.0	19.25	24.98
Sex					
Male	225	23358	24.9	21.11	29.06
Female	203	19034	19.2	16.57	22.21
Form					
Form 1	102	9765	23.8	17.79	31.04
Form 2	103	9726	23.9	19.19	29.33
Form 3	84	9317	24.6	18.99	31.21
Form 4	66	6274	17.6	12.49	24.30
Form 5	73	7310	19.4	15.46	24.10
Ethnicity					
Malay	145	14177	24.9	20.88	29.49
Chinese	30	2674	17.8	12.58	24.65
Indian	4	-	-	-	-
Bumiputera Sabah	201	20314	20.5	17.52	23.77
Bumiputera Sarawak	5	-	-	-	-
Others	43	4354	23.6	17.96	30.26

- Prevalence with high RSE, not reported

Table 3.12.3: Major cause of the most serious injury sustained in the past 12 months among adolescents who were injured in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
In a motor vehicle accident or hit by a motor vehicle	56	5594	3.2	1.89	5.53
Fell	146	14361	8.3	6.45	10.69
Something fell or hit him/her	25	2459	1.4	0.98	2.06
Attacked of abused or fighting with someone	16	1618	0.9	0.58	1.51
In a fire or too near a flame or something hot	2	-	-	-	-
Inhaled or swallowed something bad	4	-	-	-	-

- Prevalence with high RSE, not reported

Table 3.12.4: Prevalence of being abused at least once in the past 30 days among adolescents in Sabah, 2022

Socio-demographic characteristics	Physical abuse at home at least once					Verbal abuse at home at least once				
	Unweighted count	Estimated population	Prevalence (%)	95 % CI		Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper				Lower	Upper
SABAH	196	19457	10.1	8.01	12.69	904	88385	46.0	41.50	50.57
Sex										
Male	81	8340	8.9	6.44	12.20	280	29163	31.3	26.36	36.64
Female	115	11117	11.3	8.75	14.35	624	59222	59.9	54.90	64.70
Form										
Form 1	54	5246	12.8	9.06	17.91	151	14288	35.1	28.83	41.89
Form 2	52	4704	11.6	7.95	16.57	198	17693	43.6	36.44	50.98
Form 3	36	4204	11.1	7.29	16.62	162	18608	49.3	41.47	57.09
Form 4	32	3096	8.7	5.64	13.24	201	18709	52.7	41.92	63.25
Form 5	22	2207	5.9	3.97	8.57	192	19089	50.8	44.92	56.75
Ethnicity										
Malay	71	7025	12.4	8.47	17.81	237	22687	40.1	33.53	46.97
Chinese	11	981	6.5	3.44	12.08	49	4219	28.3	23.62	33.55
Indian	0	-	-	-	-	6	-	-	-	-
Bumiputera Sabah	91	9198	9.3	7.34	11.68	511	50830	51.4	47.02	55.72
Bumiputera Sarawak	0	-	-	-	-	12	1166	55.7	35.24	74.45
Others	23	2252	12.2	7.29	19.83	89	8896	48.4	36.22	60.81

- Prevalence with high RSE, not reported

Table 3.12.5: Prevalence of experience in being bullied at least once in the past 30 days among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
SABAH	194	19109	9.9	8.26	11.88
Sex					
Male	87	9178	9.8	7.40	12.85
Female	107	9931	10.0	7.82	12.82
Form					
Form 1	50	4638	11.3	8.58	14.80
Form 2	44	4111	10.1	6.17	16.10
Form 3	34	3716	9.8	5.99	15.74
Form 4	36	3498	9.9	6.75	14.16
Form 5	30	3146	8.4	5.31	12.91
Ethnicity					
Malay	64	6171	10.9	8.28	14.21
Chinese	11	-	-	-	-
Indian	1	-	-	-	-
Bumiputera Sabah	99	10009	10.1	8.72	11.66
Bumiputera Sarawak	3	-	-	-	-
Others	16	1547	8.4	4.74	14.37

- Prevalence with high RSE, not reported

Table 3.12.6: Most common ways of being bullied at least once in the past 30 days among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
Hit, kicked, pushed, shoved around or locked indoor	20	1932	1.1	0.68	1.66
Made fun of race, nationality or color	22	2142	1.2	0.75	1.86
Made fun because of religion	7	-	-	-	-
Made fun with sexual jokes, comments of gestures	22	2181	1.2	0.71	2.03
Left out activities on purpose of completely ignored	18	1715	0.9	0.57	1.57
Made fun of how body or face looks	36	3465	1.9	1.39	2.63

- Prevalence with high RSE, not reported

Table 3.12.7: Prevalence of involvement in cyberbullying activities (perpetrator) a few times within a year or more among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
SABAH	395	39282	18.9	16.28	21.90
Sex					
Male	219	22699	21.7	17.83	26.20
Female	176	16583	16.1	13.36	19.27
Form					
Form 1	73	6847	15.1	10.36	21.44
Form 2	93	8915	20.1	15.64	25.48
Form 3	75	8333	20.1	16.68	24.12
Form 4	78	7387	19.2	13.33	26.92
Form 5	76	7799	20.5	16.05	25.91
Ethnicity					
Malay	109	10840	16.4	12.90	20.70
Chinese	28	2557	16.8	14.10	19.95
Indian	5	516	38.9	18.79	63.62
Bumiputera Sabah	210	20975	20.3	16.63	24.52
Bumiputera Sarawak	7	688	32.9	17.53	53.05
Others	36	3706	19.0	14.68	24.17

Table 3.12.8: Most common ways of involvement in cyberbullying activities (perpetrator) a few times within a year or more among adolescents in Sabah, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
Ever made rude comments to anyone online	259	25762	13.4	11.26	15.91
Ever sent or posted others' embarrassing photos online	81	8155	4.3	3.43	5.25
Ever spread rumours about someone online	152	14905	7.8	6.66	9.05
Ever made threatening comments to hurt someone online	46	4722	2.5	1.63	3.71
Ever asked someone to talk about sex online	39	4055	2.1	1.55	2.89
Ever asked someone to do something sexual online	23	2343	1.2	0.75	2.00

3.13 Adolescents' Perspectives on the Impact of COVID-19 on their families

Contributors: S Maria Awaluddin, Lim Kuang Kuay, Noor Syaqilah Shawaluddin, Tuan Mohd Amin Tuan Lah, Maznieda Mahjom, Noor Ani Ahmad, Saidatul Norbaya Buang, Nik Rubiah Nik Abdul Rashid.

3.13.1 Introduction

The COVID-19 pandemic has impacted adolescents in many aspects, such as their developmental milestones and well-being, even though they are less affected by the COVID-19 disease[1]. Adolescents may have many positive and negative perspectives towards the government restrictions on gathering and outdoor activities, which will affect their mental health status[2].

3.13.2 Objectives

To determine the prevalence of adolescents, reported that:

i. Parents lost their jobs due to the COVID-19 pandemic.
ii. Their family has to cut their expenses due to the COVID-19 pandemic.
iii. Their family needs to move to a less expensive rental house due to the COVID-19 pandemic
iv. Their family had to sell properties due to the COVID-19 pandemic
v. Family relationships became strained due to the COVID-19 pandemic
vi. Family had no changes due to the COVID-19 pandemic
vii. Their family ever been infected with COVID-19

3.13.3 Variable definitions

- **Parents lost job**: the adolescent answered option "Yes" to the statement My parent/s lost his/her/their job.
- **Family has to cut their expenses**: the adolescent answered option "Yes" to the statement "Our family has to cut our expenses".
- **Family has moved to a less expensive rental house**: the adolescent answered option "Yes" to the statement My parent(s) lost his/her/their job.
- **Family had to sell properties**: the adolescent answered option "Yes" to the statement "Our family has to sell properties".
- **Family relationships became strain**: the adolescent answered option "Yes" to the statement family relationships became strained/not close.
- **Family had no changes**: adolescent who answered "No" for each subquestion of 6(a), 6(b), 6(c), 6(d), 6(e) and 6(f).
- **Family ever been infected with COVID-19**: the adolescent answered option "Yes" to the question "Has your family ever been infected with COVID-19?".

3.13.4 Findings

The prevalence of adolescents in Sabah reported that parents lost their job due to the COVID-19 pandemic was 14.3% (95% CI: 12.07, 16.87). Adolescents also reported that their family had to cut their expenses, needed to move to a less expensive rental house and had to sell properties, 51.5% (95% CI: 47.06, 55.98), 4.6% (95% CI: 3.33, 6.45) and 4.1% (95% CI: 3.10, 5.42), respectively. The prevalence of adolescents reported that family relationships became strained was 9.4% (95% CI: 8.46, 10.39). About 42.0% (95% CI: 37.93, 46.23) of adolescents reported that their family had no negative impact during the pandemic COVID-19. In terms of adolescents reporting family members ever been infected with COVID-19, the prevalence was 42.8% (95% CI: 36.12, 49.79). **(Table 3.13.1)**.

3.13.5 Discussion / Conclusion

About half of the adolescents reported that their family had experienced negative consequences following the pandemic COVID-19 including family members ever been infected with COVID-19. Identification of the family who experienced a negative impact due to the COVID-19 pandemic can prevent further mental health problems among the affected population.

3.13.6 Recommendations

Pandemic COVID-19 caused a serious impact on the marginal of the family unit in terms of economic sustainability and parent-adolescent relationships. Therefore, the recommendations are:

i. To work up on the emergency financial support system in reaching the affected family
ii. To strengthen community support such as fundraising, food donation and emergency shelter
iii. To spread awareness on Covid-19 prevention at home to prevent further disease spread
iv. To encourage adolescents to reach out for help in any difficult situation.

3.13.7 References

1. Rao N, Fisher PA. The impact of the COVID-19 pandemic on child and adolescent development around the world. Child Dev. 2021;92(5): e738–48
2. Panchal U, Salazar de Pablo G, Franco M, Moreno C, Parellada M, Arango C, et al. The impact of COVID-19 lockdown on child and adolescent mental health: systematic review. Eur Child Adolesc Psychiatry [Internet]. 2021;(0123456789). Available from: https://doi.org/10.1007/s00787-021-01856-w

Table 3.13.1: Adolescents' perspectives on the impact of COVID-19 pandemic to their family: Self-reported findings from the adolescents in Sabah, 2022

Categories of COVID-19 impact	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
Parents lost job	296	29629	14.3	12.07	16.87
Family had to cut their expenses	1064	106780	51.5	47.06	55.98
Family needed to move to less expensive rental house	96	9630	4.6	3.33	6.45
Family had to sell properties	86	8516	4.1	3.10	5.42
Family relationships became strain	196	19425	9.4	8.46	10.39
Family had no changes	886	87152	42.0	37.93	46.23

APPENDICIES

Appendix 1: Members of Steering Committee NHMS 2019-2022

1. Director General of Health
2. Deputy Director General of Health (Research & Technical Support)
3. Deputy Director General of Health (Public Health)
4. Deputy Director General of Health (Medical)
5. Principal Director, Oral Health Programme
6. Principal Director, Pharmaceutical Services
7. Principal Director, Food Safety and Quality Division
8. Director, Medical Development Division
9. Director, Planning Division
10. Director, Health Education Division
11. Director, Disease Control Division
12. Director, Family Health Development Division
13. Director, Nutrition Division
14. Representative of State Directors
15. Director, Institute for Public Health
16. Dean Faculty of Medicine, University of Malaya
17. Dean Faculty of Medicine, National University of Malaysia
18. Principal Investigator, NHMS

Appendix 2: Terms of reference for NHMS 2022 Steering Committee

1. To approve the objectives and scopes of NHMS 2019 - 2022
2. To facilitate inter and intra sectorial collaboration
3. To monitor the implementation of NHMS 2019 - 2022
4. To facilitate the utilization of the NHMS 2019 - 2022 findings

Appendix 3: List of members of Central Coordinating Committee, NHMS 2022

1. Dr. Noor Ani Ahmad, Director of Institute for Public Health
2. Mr. Lim Kuang Kuay, Principal Investigator of Adolescent Health Survey
3. Dr. Muhammad Fadhli Mohd Yusoff, Method And Statistic
4. Ms. Hamizatul Akmal Abd Hamid, Data Manager
5. Dr. Shubash Shander Ganapathy, Central Field Supervisor of Negeri Sembilan, Melaka & Johor
6. Dr. Ahmad Ali Hj Zainuddin, Central Field Supervisor of Kedah, Perlis, Pulau Pinang & Perak
7. Dr. S Maria Awaluddin, Central Field Supervisor of Kelantan, Terengganu & Pahang
8. Dr. Maznieda Mahjom, Central Field Supervisor of Selangor, Kuala Lumpur & Wilayah Putrajaya
9. Dr. Mohd Shaiful Azlan Kassim, Central Field Supervisor of Sabah, Labuan & Sarawak
10. Dr. Tan Lee Ann, Data Processing & Quality
11. Ms Noor Syaqilah Shawaluddin, Logistic Support
12. Ms. Nashrah Adilah Ismail, Project Manager

Appendix 4: Terms of Reference for NHMS 2022 Central Coordinating Team (CCT)

No	Team	Duties	Officers
1	Project Management and Finance	• Work closely with recruitment group for employment of temporary Research Assistant • Prepare Questionaires mannual, Data collection manual • Meeting with research team members, and stakeholders • Planning for data collection training • Prepare security cards/name tags for research team Arrangement for advanced payment for survey research teams • Process claims of Field Supervisors • Monitor the expenditure/budget	Mr. Lim Kuang Kuay Dr. S. Maria Awaluddin Ms. Nashrah Adilah Ismail Ms. Nurul Amalina Yusof Mr. Muhammad Safuan Suhaimi Mr. Mohamad Shafiq Abd Basid
2	Method and Data Analysis	**Before Data Collection** • Calculate the sample size • Determine the sample distribution by state • Selection of schools samples for each state • Selection of class samples from the selected school • Prepare unique ID for the selected schools and classes • Check module cover and dummy table prepared by key module **During Data Collection** • Monitoring the quality of data received from data processing team • Conducting daily data cleaning • Merge the clean dataset • Updating the monitoring board for data processing and data quality during CCT meeting • Analyst the estimate prevalence for each module during data collection **After Data Collection** • Check syntax analysis to ensure the analysis meet the module objectives • Prepare sampling weight for complex sample analysis • Check the table analysis for technical report • Prepare final database • Prepare data dictionary for reference	Ms. Hamizatul Akmal Abd Hamid Dr. Muhammad Fadhli Mohd Yusoff Ms. Nur Syahirah Ibrahim
3	Data Processing and Quality	• Setting up data processing facility Development of directory of variables database • Development of quality control (QC) manual for data processing Specify data structure for data processing and data output requirement • Responsible for data entry and data cleaning • Monitoring and evaluation of QC performance for data processing Maintenance of the scanning machine • Daily back up for databases	Dr. Tan Lee Ann Ms. Nurul Haniyah Rosslan Ms. Nur Faraeein Zainal Abidin Ms. Azlin Awatif Mohd Amir Hamzah

No	Team	Duties	Officers

4	Central Field Supervisors	**Before Data Collection**
		• Central Field Supervisors are expected to prepare for the initiation of data collection.The preparation tasks include:
		• Conduct meeting with State Education Office, School Principals, Teacher in-charged for the selected schools.
		• To ensure adequate logistic support for the data collection and liaise with the District Education Office, District Health Office and other relevant departments to ensure that:
		  • Human resources are available: Field Supervisors, Team leaders, Research Assistants and drivers.
		  • Manage transport: Vehicles
		  • Manage survey intruments and relavant form
		  • Manage lodging for data collectors
		During Data Collection
		• Gather feedback from the field on the data collection status and problems related to logistics.
		• Visit the field to help data collectors solve the problem if necessary.
		• To ensure all data collection monitoring forms have been received on time.
		• To ensure bundle from field received by the Operation Centre by hand and by post.
		• Updating the monitoring board for state acheivement and atteding CCT meeting.
			Dr. Ahmad Ali Zainuddin
			Dr. Maznieda Mahjom
			Dr. Mohd Shaiful Azlan Kassim
			Dr. S Maria Awaluddin
			Dr. Shubash Shander Ganapathy

5	Operation Centre	• Arrange date and place of meeting • Prepare and circulate briefing materials • Prepare and circulate minutes of CCT meeting • Prepare letters of appointment for Central Field Supervisors, Field Supervisors and data collectors • Prepare advertisement material for recruitment of data collectors Prepare letters of notifications for data collections • Prepare manuals for field Supervisors and data collectors • Develop a system/format and monitor the distribution of materials/ equipment for field work	Mr. Lim Kuang Kuay Ms. Nashrah Adilah Ismail

Appendix 5: List of Research Team Members, NHMS 2022

Alcohol Use

1. Dr. Rusdi Abd Rashid
2. Dr. Norli Abdul Jabbar
3. Mr. Faizul Akmal Abdul Rahim
4. Ms. Hamizatul Akmal Abd Hamid
5. Ms. Halizah Mat Rifin
6. Ms. Hasimah Ismail
7. Mr. Mohd Hatta Abdul Mutalip
8. Dr. Muhammad Fadhli Mohd Yusoff
9. Dr. Thamil Arasu Saminathan
10. Dr. Tania Gayle Robert
11. Dr. Chong Zhuo Lin

Dietary Behaviours

1. Dr. Ahmad Ali Zainuddin
2. Ms. Ainan Nasrina Ismail
3. Ms. Teh Wai Siew
4. Dr. Lai Wai Kent
5. Dr. Suhaila Abdul Ghaffar
6. Mr. Azli Bin Baharudin@ Shaharudin
7. Mr. Chong Chean Tat
8. Ms. Lalitha Palaniveloo
9. Mr. Muhammad Faiz Mohd Hisham
10. Ms. Munawara Pardi
11. Dr. Norsyamlina Che Abdul Rahim
12. Ms. Nurul Huda Ibrahim
13. Ms. Siti Adibah Ab. Halim
14. Ms. Syafinaz Mohd Sallehuddin

Nutritional Status

1. Ms. Ainan Nasrina Ismail
2. Dr. Ahmad Ali Zainuddin
3. Ms. Lalitha Palaniveloo
4. Mr. Khairul Hasnan Amali
5. Ms. Siti Adibah Ab. Halim

Drug Use

1. Dr. Mohamad Salleh Abdul Ghani
2. Dr. Norli Abdul Jabbar
3. Dr. Rushidi Abd Rashid
4. Dr. Thamil Arasu Saminathan
5. Dr. Maznieda Mahjom
6. Ms. Hasimah Ismail
7. Ms. Hamizatul Akmal Abd Hamid
8. Dr. Muhammad Fadhli Mohd Yusoff
9. Mr. Mohd Haniff Bistari
10. Dr. Halizah Mat Rifin
11. Dr. Tania Gayle Rober

Hygiene (Including Oral Health)

1. Dr. Fazila Haryati
2. Ms. Rafidah Ali
3. Dr. Chan Yee Mang
4. Mr. Mohd Hatta Abdul Mutalip
5. Dr. Nik Adilah Shahein
6. Ms. Norzawati Yoep
7. Dr. Annapurny Venkiteswaran
8. Dr. Nurulasmak Mohamed
9. Dr. Nik Daliana Nik Farid
10. Dr. Saidatul Norbaya Buang

Mental Health Problems

1. Dr. Nurashikin Ibrahim
2. Dr. Nor Rahidah Abdul Rahim
3. Dr. Noor Raihan Khamal
4. Dr. Noor Ani Ahmad,
5. Dr. Sherina Mohd Sidek
6. Ms. Norhafizah Sahril
7. Dr. Chan Yee Mang
8. Dr. Kishwen Kanna Yoga Ratnam
9. Mr. Mohd Ruhaizie Riyadzi
10. Mr. Mohd Haniff Bistari
11. Dr. Muhammad Azri Adam Adnan
12. Dr. Muhamad Khairul Nazrin Khalil
13. Dr. Mohd Shaiful Azlan Kassim
14. Mr. Mohamad Aznuddin Abd Razak
15. Ms. Nur Hidayatun Fadhilah Mohd Nor
16. Mr. Sheikh Shafizal Sheikh Ilman

Physical Activity

1. Dr. Hazizi Abu Saad
2. Dr. Mohd Azahadi Omar
3. Ms. Nur Hidayatun Fadhilah Mohd Nor
4. Dr. Muhammad Solihin Rezali
5. Dr. Affendi Isa
6. Ms. Siti Balkhis Shafie
7. Mr. Lim Kuang Kuay
8. Mr. Mohamad Aznuddin Abd Razak
9. Dr. Mohd Shaiful Azlan Kassim
10. Mr. Azli Baharudin@ Shaharudin
11. Mr. Mohd Hairmansah Mohd Shah
12. Ms. Nor'Ain Ab Wahab
13. Ms. Norliza Shamsuddin
14. Ms. Nazirah Alias
15. Ms. Nurul Haniyah Rosslan

Protective Factors

1. Dr. Nik Rubiah Nik Abdul Rashid
2. Dr. Nik Daliana Nik Farid
3. Dr. Zamzaireen Zainal Abidin
4. Ms. Nazirah Alias
5. Ms. Eida Nurhadzira Muhammad
6. Ms. Filza Noor Asari
7. Mr. Faizul Akmal Abdul Rahim
8. Dr. Tan Lee Ann
9. Dr. S Maria Awaluddin
10. Dr. Khaw Wan-Fei
11. Mr. Mohd Amierul Fikri Mahmud
12. Mr. Mohd Farihan Md Yatim
13. Dr. Nur Hamizah Nasaruddin

Sexual Behaviour that contribute to HIV infection, other STI and unintended pregnancy

1. Dr. Anita Suleiman
2. Dr. Nik Rubiah Nik Abdul Rashid
3. Dr. Chong Zhuo Lin
4. Dr. Fatin Athira Tahir
5. Dr. Mazliza Ramly
6. Dr. Maznieda Mahjom
7. Dr. Nik Adilah Shahein
8. Dr. S Maria Awaluddin
9. Dr. Noor Aliza Lodz
10. Dr. Amal Shamsudin

Tobacco Use

1. Dr. Noraryana Hassan
2. Dr. Norliana Ismail
3. Dr. Muhammad Hairul Nizam Abd Hamid
4. Ms. Ummi Nadiah Yusoff
5. Dr. Nizam Baharom
6. Mr. Lim Kuang Hock
7. Mr. Mohd Ruhaizie Riyadzi
8. Dr. Muhammad Fadhli Mohd Yusoff
9. Dr. Thamil Arasu Saminathan
10. Dr. Tania Galye Robert Lourdes
11. Dr. Halizah Mat Rifin
12. Ms. Hamizatul Akmal Abd Hamid
13. Ms. Hasimah Ismail
14. Dr. Wan Kim Sui
15. Dr. Kishwen Kanna Yoga Ratnam

Violence and Unintentional Injury

1. Ms. Hamizatul Akmal Abd Hamid
2. Dr. Tan Lee Ann
3. Dr. Nor Rahidah Abd Rahim
4. Dr. Noor Raihan Khamal
5. Mr. Mohd Hazrin Hasim@Hashim
6. Ms. Nur Faraeein Zainal Abidin
7. Dr. Noor Suraya Muhamad
8. Dr. Shubash Shander Ganapathy
9. Mr. Muhammad Hanafi Bakri

Adolescents' Perspective on the Impact of COVID-19 to their family

1. Dr. S Maria Awaluddin
2. Mr. Lim Kuang Kuay
3. Ms. Noor Syaqilah Shawaluddin
4. Mr. Tuan Mohd Amin Tuan Lah
5. Dr. Maznieda Mahjom
6. Dr. Noor Ani Ahmad
7. Dr. Saidatul Norbaya Buang
8. Dr. Nik Rubiah Nik Abdul Rashid

Appendix 6: List of Data Collection Teams, NHMS 2022

JOHOR

Field Supervisor
Dr. Lai Wai Kent

Drivers
1. Mr. Muhammad Azraei Alias
2. Mr. Mohammad Nazrin Nazmuding

Research Assistants
1. Ms. Salsabeela Mohd Ariff
2. Ms. Nurfatin Syazwana Ayob
3. Ms. Raja Nur Fatin Ainsyah Raja Omar
4. Ms. Nor Diana Zulkefli
5. Mr. Mohammad Luqman Abdul Aziz
6. Ms. Siti Noorul Nadhirah Zamrus

KEDAH

Field Supervisor
Mrs. Lalitha Palaniveloo

Drivers
1. Mr. Muhammad Shahrul Arieff Shahruddin
2. Mr. Mohamad Najmi Shahrin

Research Assistants
1. Ms. Nur Liyana Rosle
2. Mr. Muhammad Iqbal Mat Rosdi
3. Ms. Siti Nur Adibah Zainudin
4. Ms. Nur Hawanis Hashim
5. Mr. Muhammad Zaquan Mohamad Zamri
6. Ms. Noor Fazira Mhd Sofbri

KELANTAN

Field Supervisor
Dr. Norsyamlina Che Abdul Rahim

Drivers
1. Mr. Muhamad Sahasrizan Samat
2. Mr. Muhamad Izzat Amir Mohd Nasir

Research Assistants
1. Mr. Muhammad 'Izzuddin Che Ismail
2. Mr. Mohamad Azli Che Daud
3. Ms. Wan Anisa Rodzlan Hasani
4. Mr. Muhammad 'Izzuddin Che Ismail
5. Ms. Nurul Farhani Faizol
6. Ms. Siti Hajar Ishak

MELAKA

Field Supervisor
Ms. Eida Nurhadzira Muhammad

Drivers
1. Ms. Siti Zulaikha Yahya
2. Ms. Puteri Nurdhiyana Othman

Research Assistants
1. Ms. Erma Safwan Erison
2. Ms. Nur Aishah Solihin Mohmad Nezan
3. Ms. Siti Normah Abdul Manan
4. Ms. Najihah Md Din
5. Ms. Nur Anis Syafiqa Zulkefli
6. Ms. Fairuz Mohd Hashim

NEGERI SEMBILAN

Field Supervisor
Mr. Jayvikramjit Singh Manjit Singh

Drivers
1. Mr. Zakaria Mohammad
2. Mr. Gabriel Jatum

Research Assistants
1. Ms. Norsahira Kamarudin
2. Mr. Mohamad Pauzan Razali
3. Ms. Norhayati Kamarudin
4. Ms. Nurul Syuhada Samsuddin
5. Ms. Siti Aisyah Ibrahim
6. Ms. Izzati Wan Azelee

PAHANG

Field Supervisor
Mr. Sheikh Shafizal Sheikh Ilman

Drivers
1. Mr. Muhammad Ruzaini Ahmad Amri
2. Mr. Ihsan Hashim

Research Assistants
1. Ms. Norhakimah Md Din
2. Mr. Harizamharizal Syafrizal
3. Ms. Norhidayah Abdul Majid
4. Ms. Nur Aina Amira Zailani
5. Ms. Geerthana A/P R. Ravichandiran
6. Mr. Muhamad Firdaus Paizol

PULAU PINANG

Field Supervisor
Ms. Rafidah Ali

Drivers
1. Mr. Muhammad Arif Misra
2. Mr. Muhammad Syauqi Adrus

Research Assistants
1. Mrs. Eng Gaik Sim
2. Mr. Neoh Choo Loa
3. Mr. Mohammad Hasrizal Hassan
4. Mr. Tan Jun Xian
5. Mr. Muhammad Amin Sabri
6. Ms. Nurnabilah Afrina Azami

PERAK

Field Supervisor
Dr. Halizah Mat Riffin

Drivers
1. Mr. Muhammad Raidillah Che Ab. Rahim
2. Mr. Muhamad Syawal Azim Mohd Hisham

Research Assistants
1. Ms. Azieda Abu Bakar
2. Ms. Zawahir Ngah Said
3. Ms. Erma Natasa Norhan
4. Ms. Amni Zulaika Ahmad Azmi
5. Ms. Haszieyatul Affidah Hasnan
6. Mr. Amirul Amin Mohamed Tarmizi

PERLIS

Field Supervisor
Dr. Suhaila Abdul Ghaffar

Drivers
1. Mr. Mohammad Amiruddin Kamarunzaman
2. Mr. Mohd Aizam Zahid

Research Assistants
1. Ms. Ainul Mardhiah Pakhrurrazi
2. Ms. Nur Syuhada Zahid
3. Ms. Fairuz Tasnim Shaffie
4. Ms. Nor Najihah Muslim
5. Ms. Jaizah Jamil
6. Ms. Noor Faralina Izzati Kamarunzaman

SELANGOR

Field Supervisor
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