KEMENTERIAN KESIHATAN MALAYSIA

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NATIONAL HEALTH & MORBIDITY SURVEY 2022

ADOLESCENT HEALTH SURVEY 2022

JOHOR

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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 aims to determine to determine the prevalence of health risk behaviours and protective factors among adolescents in Malaysia. This nationwide cross-sectional survey used two-stage stratified sampling design and a validated self-administered questionnaire. Out of 2798 secondary schools from 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 finding showed that a total of 239 with 33,523 adolescents were involved in this study (overall response rate was 89.0%). In Johor, a total of 16 secondary schools were randomly selected and 2005 students completed the survey out of 2336 eligible students with the response rate of 85.8%.

Johor 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 Johor was 17.9%, 8.5%, 6.4% and 15.7% respectively. The prevalence of ever-alcohol drinkers among adolescents in Johor was 18.7%, 68.5% 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 5.9%, respectively. Of those who ever had sex, 29.1% had their first sexual experience before age 14, and 13.3% had at least two sexual partners. Only 9.8% of respondents or their partners had used condoms, while 12.2% used other birth control methods. A total of 18.8% 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, 13.8% claimed to have been physically attacked in the past 12 months, while 15.4% of adolescents claimed to have been involved in physical fights. With regards to bullying, 8.3% reported having been bullied in the past 30 days. A total of 14.2% of adolescents in Johor reported feeling lonely, and 12.3% 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 11.6%, 8.6%, and 9.1%, respectively. Overall, 22.6% of adolescents reported being depressed. The prevalence of truancy among adolescents in the past 30 days was 22.0%, and only 44.4% 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%, 24.6% and 34.4%, respectively. Overall, 81.9% of adolescents reported brushing their teeth twice a day in the past 30 days. A total of 49.5% of adolescents reported not knowing whether their toothpaste contained fluoride while only 19.3% used dental floss. In the past 30 days, 68.6% always used soap when washing their hands, 81.5% always washed their hands before eating, and 87.1% reported that they always washed their hands after using the toilet. In relation to dietary behaviours, 2.1% 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 33.2% and vegetables at least thrice daily was 25.2% in the past 30 days. Consumption of carbonated drinks at least once daily in the past 30 days was reported at 28.7%, while 8.7% 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 5.8% and 8.4%, respectively, while the prevalence of overweight was 15.8% and obesity was 14.9%. Prevalence of being physically active was 20.2% and 20.8% of adolescents reported active transportation to school. In addition, 69.9% of adolescents had spent at least three hours on a typical or usual day in sitting activities. Overall, 6.3% reported had ever used drug and the prevalence of current drug users was 3.5%. The prevalence of ever used marijuana was 0.9% and about 0.7% were current marijuana users. 3.6% reported had ever used kratom and the prevalence of current used kratom was 2.0.

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.

2.11 References

1. Sawyer SM, Afifi RA, Bearinger LH, et al. Adolescence: A foundation for future health. Lancet 2012;379:1630e40
2. Guthold R, Moller AB, Azzopardi P, Ba MG, Fagan L, Baltag V, Say L, Banerjee A, Diaz T. The Global Action for Measurement of Adolescent health (GAMA) Initiative-Rethinking Adolescent Metrics. J Adolesc Health. 2019 Jun;64(6):697-699
3. World Health Organization (WHO). WHO, Global school-based student health survey (GSHS). WHO. http://www.who.int/chp/gshs/en/. Accessed 17 Aug 2022
4. Biswas T, Townsend N, Huda M, Maravilla J, Begum T, Pervin S, et al. 2022. Prevalence of multiple non-communicable diseases risk factors among adolescents in 140 countries: A population-based study. eClinicalMedicine. 2022;52: 101591
5. Institute for Public Health (IPH) 2012. National Health and Morbidity Survey (NHMS) 2012: Adolescent Health Survey 2012, Malaysia
6. Institute for Public Health (IPH) 2017. National Health and Morbidity Survey (NHMS) 2017: Adolescent Health Survey 2017, Malaysia

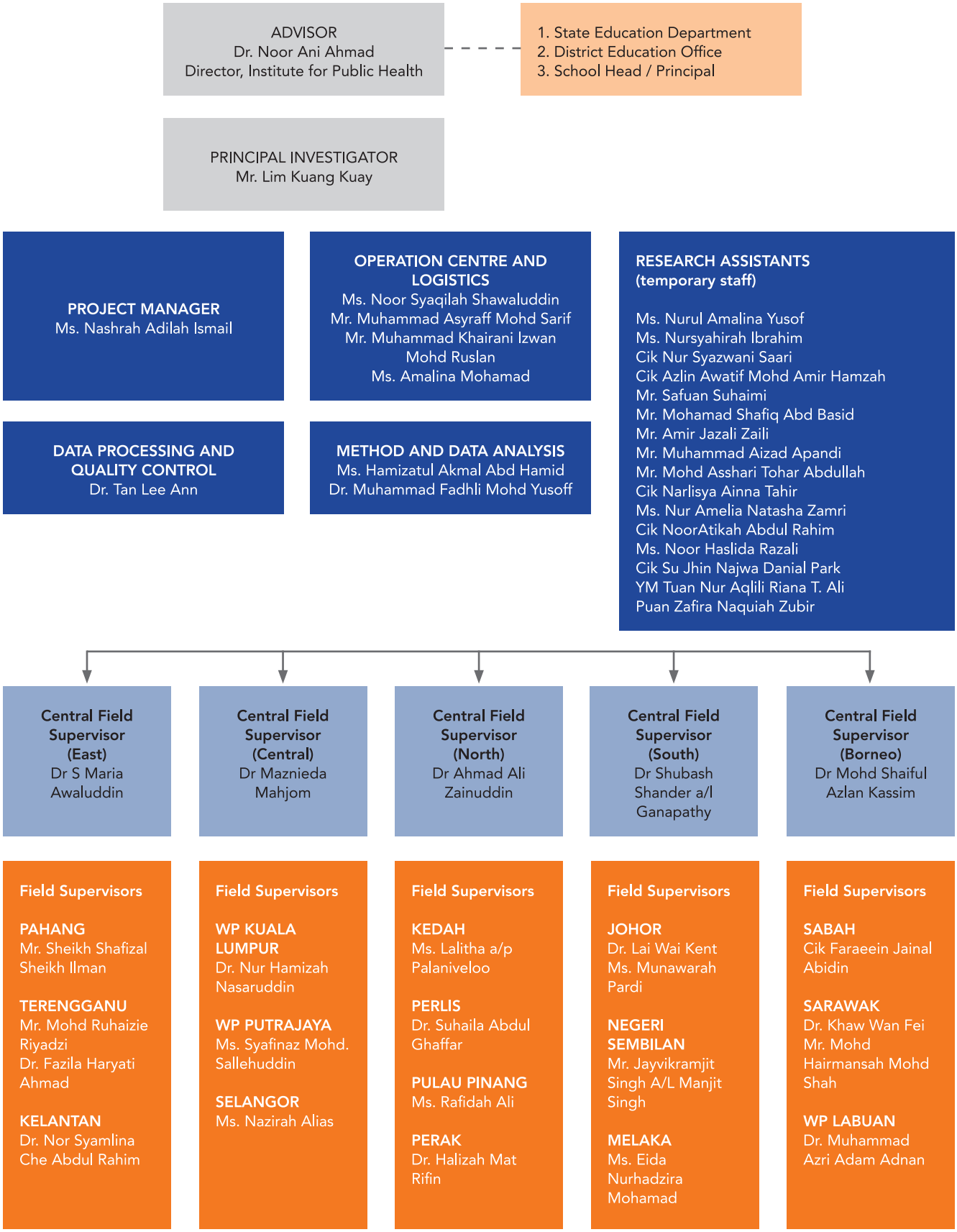

Figure 1: Organisation chart for data collection team NHMS 2022

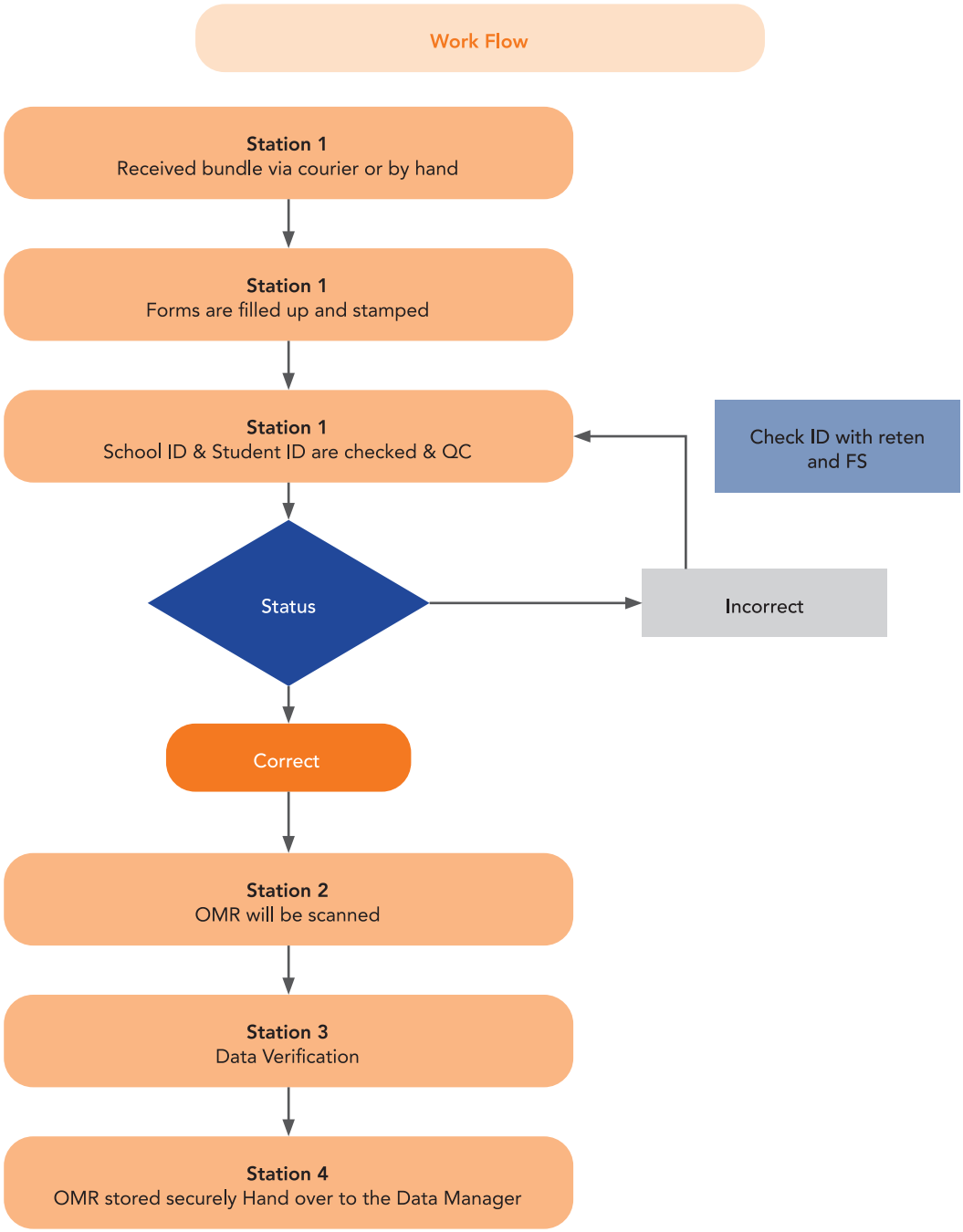

Figure 2: Workflow of Data Processing NHMS 2022

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 Terengganu (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**

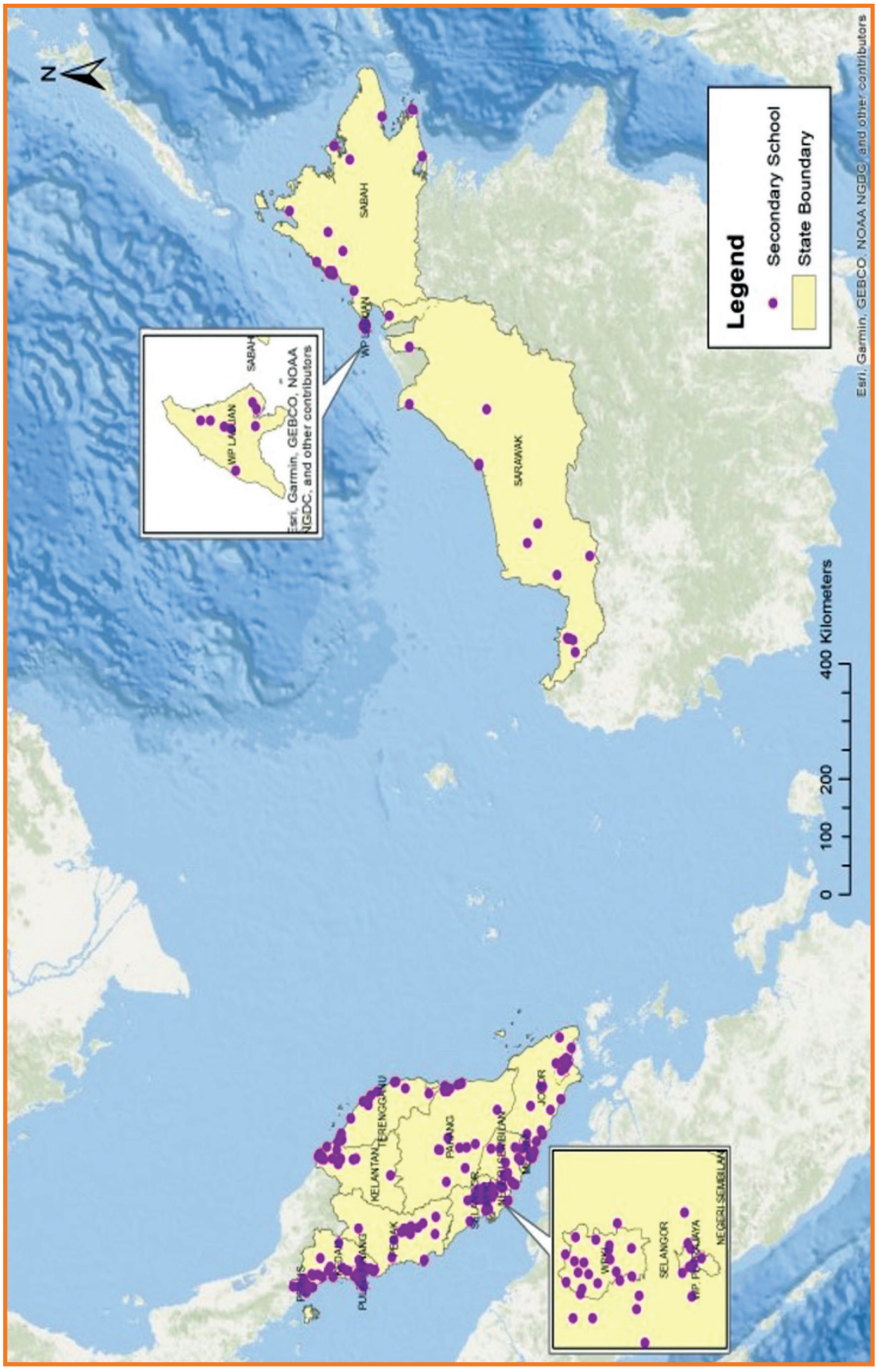

Figure 3: GIS mapping of the selected secondary schools

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 Johor was 18.7% (95% CI: 10.95, 30.01). Males had a higher prevalence at 19.8% (95% CI: 11.05, 33.00) compared to females at 17.5% (95% CI: 9.66, 29.61). **(Table 3.2.1)**

Initiation of First Alcohol Use Before 14 years old
Among ever alcohol drinkers, 68.5% had their first alcoholic beverage before the age of 14 years. **(Table 3.2.2)**

Sources of Obtaining Alcoholic Beverages Among Current Alcohol Drinkers
Among current alcohol drinkers, most adolescents obtained their alcoholic beverages from their family 69.8% followed by 18.0% buying the beverages from a store, shop or street vendor. **(Table 3.2.3)**

Social Problems as a Result of Alcohol Drinking
Overall, majority (90.0%) 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 3.2.4)**

Parental and peer drinking
Parental drinking among current alcohol drinkers in Johor was reported as 75.1%, while peer drinking was 82.5%.

Drunkenness
Among ever alcohol drinkers, only 12.6% reported drunkenness.

3.2.5 Discussion / Conclusion

According to this study, the prevalence of ever alcohol drinkers among adolescents in Johor in 2022 was 18.7% which was about the same as the national prevalence of 18.6%. However, at 68.5%, the proportion of adolescents who drank alcohol for the first time before turning 14 years old remained high. As in earlier surveys, family members remained the primary source of acquiring alcoholic beverages. This can promote home-based underage drinking involvement among the family. An important indicator to support this is the percentage of peer drinking among the current drinkers, which stood at 82.5%.

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

1. World Health Organization,Key Fact: Alcohol. https://www.who.int/news-room/fact-sheets/detail/alcohol
2. World Health Organisation. Alcohol. https://www.who.int/health-topics/alcohol

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

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
JOHOR	407	48564	18.7	10.95	30.01
Sex					
Male	219	25997	19.8	11.05	33.00
Female	188	22567	17.5	9.66	29.61
Form					
Form 1	73	-	-	-	-
Form 2	86	10561	19.9	10.25	35.15
Form 3	71	10380	19.6	10.96	32.67
Form 4	77	8215	16.7	8.95	29.04
Form 5	100	10624	22.3	11.38	39.00
Ethnicity					
Malay	39	5054	2.9	1.86	4.64
Chinese	342	40144	62.0	52.30	70.81
Indian	15	2046	10.2	5.86	17.30
Bumiputera Sabah	1	-	-	-	-
Bumiputera Sarawak	4	-	-	-	-
Others	6	-	-	-	-

-Prevalence with high RSE, not reported

Table 3.2.2: Proportion of ever alcohol drinkers according to alcohol initiation age among adolescents in Johor, 2022

Initiation age of alcohol drinking	Unweighted count	Percentage (%)
Below 14 years old	245	68.5
14 years old and above	116	31.5

Table 3.2.3: Usual sources of obtaining alcohol in the past 30 days among current drinkers among adolescents in Johor, 2022

Sources of obtaining alcohol	Unweighted count	Percentage (%)
I bought from a store, shop or from a street vendor	25	18.0
I gave someone else money to buy it for me	3	-
I got it from my friend	8	-
I got it from my family	94	69.8
I stole it or got it without permission	0	-
I got it some other way	4	-

-Prevalence with high RSE, not reported

Table 3.2.4: 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 Johor, 2022

Number of times	Unweighted count	Percentage (%)
0 times	368	90.0
1 to 2 times	26	-
3 to 9 times	1	-
10 or more times	11	-

-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 Johor. 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 2.1% (95% CI: 1.50, 3.02) 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)**. The prevalence of being hungry was higher among females (3.5%, 95% CI: 2.32, 5.31) as compared to male counterparts.

Fruit consumption
A total of 33.2% (95% CI: 30.02, 36.59) of adolescents consumed fruit at least twice daily in the past 30 days **(Table 3.3.2)**. There were 35.4% (95% CI: 31.22, 39.81) of males and 31.0% (95% CI: 27.39, 34.87) of females who reported consuming fruit at least twice daily.

Vegetable consumption
About 25.2% (95% CI: 22.56, 28.10) of adolescents consumed vegetables at least three times daily in the past 30 days **(Table 3.3.3)**. There were 28.5% (95% CI: 25.16, 32.19) of males and 21.9% (95% CI: 18.40, 25.78) of females who reported consuming vegetables at least three times daily.

Fruits and vegetables intake
About 13.6% (95% CI: 11.49, 15.91) of adolescents consumed fruits and vegetables at least five times daily in the past 30 days **(Table 3.3.4)**. There were 15.7% (95% CI: 12.96, 18.87) of males and 11.4% (95% CI: 9.14, 14.07) of females who reported consuming fruits and vegetables of at least five times daily.

Never Consume Fruit
About 9.2% (95% CI: 7.26, 11.62) of adolescents reported never consume fruit in the past 30 days **(Table 3.3.5)**. Both male and female reported the same prevalence of never consume fruit.

Never Consume Vegetable
About 8.1% (95% CI: 6.67, 9.83) of adolescents never consume vegetable in the past 30 days **(Table 3.3.5).** Prevalence of never consume vegetable was 7.5% (95% CI: 5.89, 9.62) among males and 8.7% (95% CI: 7.08, 10.60) among females.

Never Consume Fruit and Vegetable
A total of 2.0% (95% CI: 1.28, 3.19) of adolescents never consume fruit and vegetable in the past 30 days **(Table 3.3.5)**. Prevalence of never consume fruit and vegetable was 2.1% (95% CI: 1.24, 3.44) among males and 2.0% (95% CI: 1.11, 3.49) among females.

Carbonated soft drinks intake

Overall, 28.7% (95% CI: 25.91, 31.74) of adolescents consumed carbonated soft drinks at least once daily in the past 30 days **(Table 3.3.6)**. There were 30.1% (95% CI: 26.56, 33.80) of males and 27.4% (95% CI: 24.26, 30.80) of females who reported consuming carbonated soft drinks of at least once daily.

Plain water intake

About 47.4% (95% CI: 44.57, 50.16) 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 less than six glasses per day among female (54.5%, 95% CI: 50.40, 58.53) was significantly higher than male (40.3%, 95% CI: 36.85, 43.88).

Milk and milk products intake

About 20.7% (95% CI: 18.52, 23.10) of adolescents consumed milk/milk products at least two times per day in the past 30 days **(Table 3.3.8)**. There were 20.3% (95% CI: 18.04, 22.80) of males and 21.1% (95% CI: 17.14, 25.74) of females who reported consuming milk/milk products at least two times daily.

Fast food intake

About 8.7% (95% CI: 7.33, 10.34) 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 higher among female (10.4%, 95% CI: 8.83, 12.17) compared to male (7.1%, 95% CI: 5.03, 9.89).

3.3.5 Discussions / Conclusion

In Johor, there were 2.1% 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 33.2% and 25.2%, respectively. However, only 13.6% of them consumed fruits and vegetables five times daily. About 47.4% of adolescents reported drinking plain water less than 6 glasses and 20.7% consumed milk/milk products at least two times daily. Consumption of carbonated soft drinks of at least once daily in the past 30 days was reported at 28.7% while 8.7% 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 Johor 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 Johor

	NHMS 2012	NHMS 2017	NHMS 2022
Most of the time or always went hungry	5.7	3.6	2.1
Fruits intake of at least twice daily	41.0	38.2	33.2
Vegetables intake of at least three times daily	32.3	29.2	25.2
Fruits and vegetables intake of at least five times daily	29.8	15.8	13.6
Carbonated soft drinks consumption at least once daily	31.4	23.4	28.7
Milk/milk products intake of at least two times daily	Not reported	27.2	20.7
Fast food intake of at least three days in the past seven days	7.3	7.1	8.7

3.3.7 References

1. Fletcher EA, McNaughton SA, Crawford D, Cleland V, Della Gatta J, Hatt J, Dollman J, Timperio A. Associations between sedentary behaviours and dietary intakes among adolescents. Public Health Nutr. 2018 Apr;21(6):1115-1122
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 Johor 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
JOHOR	41	5541	2.1	1.50	3.02
Sex					
Male	8	-	-	-	-
Female	33	4550	3.5	2.32	5.31
Form					
Form 1	10	1377	2.4	1.44	3.97
Form 2	9	1214	2.3	1.26	4.10
Form 3	5	-	-	-	-
Form 4	10	-	-	-	-
Form 5	7	846	1.8	1.04	3.00
Ethnicity					
Malay	36	4883	2.8	1.99	4.05
Chinese	2	-	-	-	-
Indian	1	-	-	-	-
Bumiputera Sabah	0	-	-	-	-
Bumiputera Sarawak	0	-	-	-	-
Others	2	-	-	-	-

Note:
- 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 Johor, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
JOHOR	658	86353	33.2	30.02	36.59
Sex					
Male	355	46360	35.4	31.22	39.81
Female	303	39992	31.0	27.39	34.87
Form					
Form 1	164	22494	39.3	34.94	43.90
Form 2	129	17319	32.7	26.90	38.99
Form 3	106	15672	29.6	24.68	35.15
Form 4	146	17162	34.9	27.66	42.92
Form 5	113	13706	28.7	22.27	36.20
Ethnicity					
Malay	460	62007	36.2	33.26	39.16
Chinese	111	13428	20.7	16.54	25.67
Indian	67	8371	41.9	33.20	51.16
Bumiputera Sabah	3	380	75.4	19.36	97.50
Bumiputera Sarawak	9	1213	58.9	43.36	72.89
Others	8	954	81.4	56.37	93.69

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

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
JOHOR	513	65627	25.2	22.56	28.10
Sex					
Male	296	37417	28.5	25.16	32.19
Female	217	28210	21.9	18.40	25.78
Form					
Form 1	127	16932	29.5	23.81	35.99
Form 2	100	12971	24.4	19.23	30.46
Form 3	85	12656	23.9	17.17	32.33
Form 4	120	13492	27.4	23.57	31.68
Form 5	81	9576	20.1	16.80	23.90
Ethnicity					
Malay	315	41595	24.2	21.80	26.85
Chinese	125	14789	22.8	19.35	26.74
Indian	61	7700	38.6	27.47	50.97
Bumiputera Sabah	3	390	77.4	21.26	97.76
Bumiputera Sarawak	5	-	-	-	-
Others	4	-	-	-	-

- 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 Johor, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
JOHOR	275	35256	13.6	11.49	15.91
Sex					
Male	162	20568	15.7	12.96	18.87
Female	113	14688	11.4	9.14	14.07
Form					
Form 1	75	9891	17.3	13.28	22.11
Form 2	54	7217	13.6	9.56	18.95
Form 3	39	5716	10.8	6.55	17.33
Form 4	68	7743	15.7	11.89	20.57
Form 5	39	4690	9.8	7.25	13.21
Ethnicity					
Malay	175	22935	13.4	11.47	15.50
Chinese	54	6596	10.2	7.21	14.19
Indian	37	4569	22.9	13.20	36.66
Bumiputera Sabah	2	-	-	-	-
Bumiputera Sarawak	3	-	-	-	-
Others	4	-	-	-	-

- 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 Johor, 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
JOHOR	185	23941	9.2	7.26	11.62	157	21085	8.1	6.67	9.83	40	5273	2.0	1.28	3.19
Sex															
Male	95	12055	9.2	7.03	11.96	74	9888	7.5	5.89	9.62	21	2720	2.1	1.24	3.44
Female	90	11886	9.2	7.16	11.79	83	11197	8.7	7.08	10.60	19	2554	2.0	1.11	3.49
Form															
Form 1	37	5129	9.0	5.77	13.67	29	4126	7.2	4.67	10.93	7	-	-	-	-
Form 2	43	5770	10.9	8.03	14.59	42	5789	10.9	7.72	15.17	12	1695	3.2	1.77	5.67
Form 3	33	4911	9.3	6.99	12.25	26	4052	7.7	5.50	10.59	4	-	-	-	-
Form 4	44	4946	10.1	7.13	14.01	31	3802	7.7	5.33	11.08	10	1156	2.4	1.35	4.08
Form 5	28	3184	6.7	3.93	11.13	29	3316	7.0	4.88	9.85	7	-	-	-	-
Ethnicity															
Malay	126	16839	9.8	7.47	12.80	126	17180	10.0	8.24	12.11	31	4134	2.4	1.48	3.90
Chinese	43	5134	7.9	5.85	10.67	16	1932	3.0	1.88	4.70	5	596	0.9	0.52	1.62
Indian	14	1754	8.8	5.55	13.61	12	-	-	-	-	4	-	-	-	-
Bumiputera Sabah	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-
Bumiputera Sarawak	1	-	-	-	-	2	-	-	-	-	0	-	-	-	-
Others	1	-	-	-	-	1	-	-	-	-	0	-	-	-	-

- 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 Johor, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
JOHOR	567	74778	28.7	25.91	31.74
Sex					
Male	301	39393	30.1	26.56	33.80
Female	266	35385	27.4	24.26	30.80
Form					
Form 1	122	16408	28.6	23.79	34.00
Form 2	126	16774	31.6	26.21	37.46
Form 3	114	17349	32.8	27.10	39.10
Form 4	113	13023	26.5	21.30	32.41
Form 5	92	11224	23.5	18.29	29.74
Ethnicity					
Malay	393	53331	31.1	27.86	34.45
Chinese	122	14448	22.3	16.87	28.90
Indian	47	6353	31.8	25.80	38.49
Bumiputera Sabah	2	-	-	-	-
Bumiputera Sarawak	1	-	-	-	-
Others	2	-	-	-	-

- Prevalence with high RSE, not reported

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

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
JOHOR	949	123127	47.4	44.57	50.16
Sex					
Male	409	52767	40.3	36.85	43.88
Female	540	70359	54.5	50.40	58.53
Form					
Form 1	196	26493	46.2	42.10	50.39
Form 2	185	24722	46.5	42.45	50.65
Form 3	177	26556	50.2	45.12	55.34
Form 4	200	23448	47.8	42.59	53.02
Form 5	191	21907	46.0	40.48	51.66
Ethnicity					
Malay	614	82464	48.0	45.47	50.64
Chinese	248	29603	45.8	39.45	52.25
Indian	72	9264	46.4	38.10	54.87
Bumiputera Sabah	1	-	-	-	-
Bumiputera Sarawak	9	1091	53.0	31.88	73.12
Others	5	-	-	-	-

- 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 Johor, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
JOHOR	409	53874	20.7	18.52	23.10
Sex					
Male	206	26602	20.3	18.04	22.80
Female	203	27272	21.1	17.14	25.74
Form					
Form 1	74	10240	17.9	14.20	22.35
Form 2	79	10617	20.0	16.35	24.18
Form 3	71	10935	20.7	14.96	27.89
Form 4	104	12193	24.8	20.75	29.35
Form 5	81	9887	20.7	16.57	25.62
Ethnicity					
Malay	294	39822	23.2	21.31	25.23
Chinese	56	6521	10.1	6.95	14.38
Indian	49	6335	31.7	24.36	40.12
Bumiputera Sabah	3	390	77.4	21.26	97.76
Bumiputera Sarawak	3	-	-	-	-
Others	4	438	37.4	18.70	60.87

- 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 Johor, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
JOHOR	176	22692	8.7	7.33	10.34
Sex					
Male	74	9289	7.1	5.03	9.89
Female	102	13403	10.4	8.83	12.17
Form					
Form 1	36	4944	8.6	5.43	13.42
Form 2	27	3562	6.7	4.63	9.62
Form 3	36	5290	10.0	6.54	15.02
Form 4	46	5214	10.6	7.16	15.44
Form 5	31	3682	7.7	5.01	11.72
Ethnicity					
Malay	126	16761	9.8	7.71	12.28
Chinese	26	2921	4.5	2.70	7.46
Indian	18	2187	11.0	6.36	18.22
Bumiputera Sabah	0	-	-	-	-
Bumiputera Sarawak	3	-	-	-	-
Others	3	-	-	-	-

- 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 5.8% (95% CI: 4.56, 7.32). Female [6.9%, (95% CI: 5.19, 9.24)] showed higher prevalence compared to males [4.6%, (95% CI: 2.90, 7.34)]. **(Table 3.4.1).**

BMI -for-Age z-score

According to the WHO 2007 Growth Reference Data for 5-19 years, the national prevalence of thinness among adolescents was 8.4% (95% CI: 7.56, 9.29). The data showed that the prevalence of thinness was significantly higher among males [11.1%, (95% CI: 9.52, 12.97)] compared to females [5.6%, (95% CI: 4.36, 7.18)]. **(Table 3.4.2)**.

Overweight and Obesity

The prevalence of overweight was 15.8% (95% CI: 13.67, 18.19. Comparing the sexes, females had a higher prevalence at 17.0% (95% CI: 14.40, 19.94)] compared to males [14.6% (95% CI: 11.28, 18.77]. **(Table 3.4.3).** For obesity, the prevalence was 14.9% (95% CI: 13.44, 16.50). Between the sexes, males had a higher prevalence of obesity at 17.7% (95% CI: 14.94, 20.75) compared to females [12.1% (95% CI: 10.37, 14.08)] **(Table 3.4.3)**.

3.4.5 Discussion / Conclusion

Overall, the prevalence of overweight and obesity totalling 30.7% was higher than thinness (8.4%) and stunting (5.8%). It can be concluded that adolescent in Johor is facing a dual burden of malnutrition, with overnutrition appearing to be a larger problem than undernutrition.

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 Johor, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
JOHOR	114	15047	5.8	4.56	7.32
Sex					
Male	45	6085	4.6	2.90	7.34
Female	69	8962	6.9	5.19	9.24
Form					
Form 1	17	-	-	-	-
Form 2	20	2724	5.1	3.03	8.57
Form 3	16	2548	4.8	2.84	8.07
Form 4	29	3567	7.3	5.51	9.50
Form 5	32	3840	8.1	5.11	12.46
Ethnicity					
Malay	96	12762	7.4	5.84	9.42
Chinese	12	1494	2.3	1.23	4.30
Indian	4	-	-	-	-
Bumiputera Sabah	0	-	-	-	-
Bumiputera Sarawak	1	-	-	-	-
Others	1	-	-	-	-

- Prevalence with high RSE, not reported

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

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
JOHOR	171	21817	8.4	7.56	9.29
Sex					
Male	116	14588	11.1	9.52	12.97
Female	55	7229	5.6	4.36	7.18
Form					
Form 1	30	3928	6.9	5.01	9.30
Form 2	38	5024	9.5	6.76	13.13
Form 3	26	3925	7.4	5.05	10.78
Form 4	36	3930	8.0	5.87	10.79
Form 5	41	5010	10.5	7.60	14.34
Ethnicity					
Malay	104	13720	8.0	6.84	9.32
Chinese	46	5535	8.6	6.76	10.78
Indian	19	2301	11.5	7.55	17.19
Bumiputera Sabah	1	-	-	-	-
Bumiputera Sarawak	1	-	-	-	-
Others	0	-	-	-	-

- Prevalence with high RSE, not reported

Table 3.4.3: Prevalence of overweight (BAZ >+1SD to ≤+2SD) and obesity (BAZ >+2SD) among adolescents in Johor, 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
JOHOR	318	41096	15.8	13.67	18.19	295	38760	14.9	13.44	16.50
Sex										
Male	152	19177	14.6	11.28	18.77	177	23147	17.7	14.94	20.75
Female	166	21919	17.0	14.40	19.94	118	15613	12.1	10.37	14.08
Form										
Form 1	68	9335	16.3	13.57	19.42	62	8476	14.8	12.89	16.91
Form 2	74	9685	18.3	12.73	25.50	61	8211	15.5	11.08	21.22
Form 3	58	8791	16.6	11.87	22.80	57	8583	16.2	12.95	20.17
Form 4	56	6491	13.2	9.80	17.56	56	6292	12.8	9.53	16.99
Form 5	62	6794	14.2	9.41	20.98	59	7197	15.1	11.95	18.88
Ethnicity										
Malay	181	24689	14.4	11.70	17.55	217	29421	17.1	15.48	18.92
Chinese	111	13212	20.4	16.91	24.48	52	6155	9.5	6.94	12.92
Indian	21	2636	13.2	9.69	17.72	22	2707	13.6	8.56	20.81
Bumiputera Sabah	0	-	-	-	-	0	-	-	-	-
Bumiputera Sarawak	3	-	-	-	-	3	-	-	-	-
Others	2	-	-	-	-	1	-	-	-	-

- 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, 6.3% (95% CI: 4.72, 8.47) of adolescents reported that they had ever used drug during their lifetime and it was significantly higher among males [8.7% (95%CI: 6.03, 12.50)] as compared to females [3.9% (95%CI: 2.52, 6.05)] **(Table 3.5.1)**. The prevalence of current drug users was 3.5% (95%CI: 2.47, 4.85); males [5.0% (95%CI: 3.07, 7.90)] were significantly higher than females [2.0% (95%CI: 1.13, 3.38)] **(Table 3.5.2).**

The prevalence of ever used marijuana in a lifetime was 0.9% (95% CI: 0.58, 1.47), and male adolescents at 1.5% (95%CI: 0.86, 2.52) **(Table 3.5.3**). From this survey, about 0.7% (95% CI: 0.38, 1.22) of current marijuana users in the past 30 days are from males [1.1% (95%CI: 0.61, 1.96)] **(Table 3.5.3).**

Overall, 2.7% (95% CI: 1.83, 4.01) of adolescents reported had ever used inhalant during their lifetime. Males was also significantly higher [3.1% (95% CI: 1.81, 5.32)] than females [2.3% (95% CI: 1.41, 3.74)] **(Table 3.5.4).** Overall, 1.6% (95% CI: 1.16, 2.33) of adolescents reported had current used inhalant in the past 30 days. Males was also significantly higher [2.1% (95% CI: 1.18, 3.55)] than females [1.2% (95% CI: 0.68, 2.26)] **(Table 3.5.4).**

Overall, 3.6% (95% CI: 2.36, 5.38) of adolescents reported had ever used kratom during their lifetime and about 6.0% (95% CI: 3.82, 9.17)] of adolescents are male **(Table 3.5.5).** From the data, about 2.0% (95% CI: 1.21, 3.20) of adolescents reported had current used kratom in the past 30 days and about 3.3% (95% CI: 1.88, 5.84) are males **(Table 3.5.5).** Among current users, about 52.4% had bought drugs from someone else **(Table 3.5.6**). Among ever drug users, 72.3% (95% CI: 40.84, 90.84) of them had initiated before the age of 14 years old **(Table 3.5.7).**

3.5.5 Discussion / Conclusion

Based on data, the current use of kratom is the highest among the drugs.

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

1. United Nations Office on Drugs and Crime (UNODC), World Drug Report 2022; Booklet 1; Executive Summary and Policy Implication (ISBN: 9789211483758) https://www.unodc.org/unodc/en/data-and-analysis/world-drug-report-2022.html
2. Institute for Public Health (IPH) 2020. The National Health and Morbidity Survey 2019: NCD. Kuala Lumpur: Ministry of Health Malaysia
3. Bahagian Dasar, Perancangan dan Penyelidkan, Agensi Antidadah Kebangsaan, Kementerian Dalam Negeri; Info Dadah Siri 1/2020; Penyalahgunaan Dadah Dalam Kalangan Remaja; 4 JUN 2020

Table 3.5.1: Prevalence of ever drug use among adolescents in Johor, 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
JOHOR	73	8955	3.5	2.41	4.96	130	16445	6.3	4.72	8.47
Sex										
Male	42	5200	4.0	2.50	6.32	89	11393	8.7	6.03	12.50
Female	31	3755	2.9	1.75	4.86	41	5051	3.9	2.52	6.05
Form										
Form 1	18	-	-	-	-	25	3456	6.1	3.47	10.40
Form 2	19	2284	4.3	2.29	8.05	24	3026	5.7	3.64	8.85
Form 3	7	-	-	-	-	16	-	-	-	-
Form 4	14	-	-	-	-	32	3449	7.1	4.49	10.92
Form 5	15	1669	3.5	2.00	6.12	33	4057	8.5	5.49	13.06
Ethnicity										
Malay	37	4689	2.8	1.50	5.01	92	11914	7.0	4.89	9.85
Chinese	18	-	-	-	-	18	-	-	-	-
Indian	17	2227	11.2	6.68	18.26	18	2354	11.8	7.38	18.31
Bumiputera Sabah	0	-	-	-	-	0	-	-	-	-
Bumiputera Sarawak	0	-	-	-	-	0	-	-	-	-
Others	1	-	-	-	-	2	-	-	-	-

- Prevalence with high RSE, not reported

Table 3.5.2: Prevalence of current drug use among adolescents in Johor, 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
JOHOR	46	5819	2.2	1.70	2.95	70	8984	3.5	2.47	4.85
Sex										
Male	28	3670	2.8	1.81	4.35	49	6458	5.0	3.07	7.90
Female	18	2149	1.7	0.90	3.06	21	2526	2.0	1.13	3.38
Form										
Form 1	17	-	-	-	-	20	2766	4.9	2.69	8.60
Form 2	11	1384	2.6	1.43	4.72	12	1535	2.9	1.74	4.79
Form 3	3	-	-	-	-	7	-	-	-	-
Form 4	9	-	-	-	-	16	1710	3.5	1.92	6.29
Form 5	6	-	-	-	-	15	-	-	-	-
Ethnicity										
Malay	21	2736	1.6	1.00	2.57	45	5901	3.5	2.26	5.26
Chinese	9	-	-	-	-	9	-	-	-	-
Indian	14	1827	9.1	5.64	14.49	14	1827	9.1	5.64	14.49
Bumiputera Sabah	0	-	-	-	-	0	-	-	-	-
Bumiputera Sarawak	0	-	-	-	-	0	-	-	-	-
Others	2	-	-	-	-	2	-	-	-	-

- 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: Prevalence of marijuana use among adolescents in Johor, 2022

Socio-demographic characteristics	Ever used marijuana in a lifetime					Current used marijuana in the past 30 days				
	Unweighted count	Estimated population	Prevalence (%)	95 % CI		Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper				Lower	Upper
JOHOR	19	2397	0.9	0.58	1.47	14	1775	0.7	0.38	1.22
Sex										
Male	15	1929	1.5	0.86	2.52	11	1431	1.1	0.61	1.96
Female	4	-	-	-	-	3	-	-	-	-
Form										
Form 1	5	-	-	-	-	5	-	-	-	-
Form 2	5	-	-	-	-	4	-	-	-	-
Form 3	1	-	-	-	-	1	-	-	-	-
Form 4	6	-	-	-	-	4	-	-	-	-
Form 5	2	-	-	-	-	0	-	-	-	-
Ethnicity										
Malay	11	1380	0.8	0.45	1.46	5	-	-	-	-
Chinese	1	-	-	-	-	2	-	-	-	-
Indian	6	-	-	-	-	6	-	-	-	-
Bumiputera Sabah	0	-	-	-	-	0	-	-	-	-
Bumiputera Sarawak	0	-	-	-	-	0	-	-	-	-
Others	1	-	-	-	-	1	-	-	-	-

- Prevalence with high RSE, not reported

Table 3.5.4: Prevalence of inhalant use among adolescents in Johor, 2022

Socio-demographic characteristics	Ever used inhalant in a lifetime					Current used inhalant in the past 30 days				
	Unweighted count	Estimated population	Prevalence (%)	95 % CI		Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper				Lower	Upper
JOHOR	56	7042	2.7	1.83	4.01	34	4276	1.6	1.16	2.33
Sex										
Male	32	4071	3.1	1.81	5.32	21	2677	2.1	1.18	3.55
Female	24	2971	2.3	1.41	3.74	13	1599	1.2	0.68	2.26
Form										
Form 1	15	-	-	-	-	14	-	-	-	-
Form 2	13	1643	3.1	1.77	5.39	8	-	-	-	-
Form 3	7	-	-	-	-	2	-	-	-	-
Form 4	10	1091	2.2	1.26	3.92	7	-	-	-	-
Form 5	11	-	-	-	-	3	-	-	-	-
Ethnicity										
Malay	31	-	-	-	-	16	-	-	-	-
Chinese	13	1406	2.2	1.16	4.03	7	789	1.2	0.74	1.99
Indian	11	1557	7.8	4.18	14.09	9	1125	5.6	3.15	9.88
Bumiputera Sabah	0	-	-	-	-	0	-	-	-	-
Bumiputera Sarawak	0	-	-	-	-	0	-	-	-	-
Others	1	-	-	-	-	2	-	-	-	-

- Prevalence with high RSE, not reported

Table 3.5.5: Prevalence of kratom use among adolescents in Johor, 2022

Socio-demographic characteristics	Ever used kratom in a lifetime					Current used kratom in the past 30 days				
	Unweighted count	Estimated population	Prevalence (%)	95 % CI		Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper				Lower	Upper
JOHOR	71	9271	3.6	2.36	5.38	39	5109	2.0	1.21	3.20
Sex										
Male	59	7770	6.0	3.82	9.17	33	4345	3.3	1.88	5.84
Female	12	-	-	-	-	6	-	-	-	-
Form										
Form 1	11	-	-	-	-	9	-	-	-	-
Form 2	9	1212	2.3	1.27	4.08	6	-	-	-	-
Form 3	10	-	-	-	-	5	-	-	-	-
Form 4	22	2379	4.9	2.59	8.96	10	-	-	-	-
Form 5	19	-	-	-	-	9	-	-	-	-
Ethnicity										
Malay	62	8077	4.7	3.09	7.17	31	4068	2.4	1.26	4.45
Chinese	2	-	-	-	-	2	-	-	-	-
Indian	5	-	-	-	-	4	-	-	-	-
Bumiputera Sabah	0	-	-	-	-	0	-	-	-	-
Bumiputera Sarawak	0	-	-	-	-	0	-	-	-	-
Others	2	-	-	-	-	2	-	-	-	-

- Prevalence with high RSE, not reported

Table 3.5.6: Source of getting drugs in the past 30 days among current drug users among adolescents in Johor, 2022

Socio-demographic characteristics	Unweighted count	Percentage (%)
I bought them form someone	7	52.4
I give someone else money to buy it for me	3	-
I stole it or got it without permission	0	-
I got it from my friend	2	-
I got it from my family	1	-
I got it some other ways	0	-

- Prevalence with high RSE, not reported

Table 3.5.7: Prevalence of first use of drug before the age of 14 years among ever used drug among adolescents in Johor, 2022

Prevalence	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
Yes	9	1076	72.3	40.84	90.84
No	3	-	-	-	-

- Prevalence with high RSE, not reported

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

3.9% (95%CI: 2.94, 5.20) of adolescents in Johor perceived their oral health as poor or very poor **(Table 3.6.1)**. 81.9% (95%CI: 79.03, 84.39) brushed their teeth twice daily which was significantly higher among females [85.8% (95%CI: 82.63, 88.39)] **(Table 3.6.2)**, 7.7% (95%CI: 6.17, 9.46) never performed daily tongue cleaning **(Table 3.6.3)**, 49.5% (95%CI: 41.69, 57.26) reported not knowing whether their toothpaste contained fluoride **(Table 3.6.4)** and only 19.3% (95%CI: 16.94, 21.99) used dental floss for cleaning their teeth **(Table 3.6.5)**. Only 27.0% (95%CI: 21.04, 33.86) reported to have their last dental visit in the past 12 months **(Table 3.6.6)**, 7.7% (95% CI: 5.67, 10.38) had toothache in the past 12 months and had missed class or not participated with online learning (PdPR) **(Table 3.6.7)**. 29.4% (95%CI: 26.47, 32.53) reported that they had avoided smiling or laughing due to the appearance of their teeth which was significantly higher among females [36.2% (95%CI: 30.58, 42.18)] **(Table 3.6.8)**. The prevalence of Johor adolescents who used soap most of the time or always was 68.6% (95%CI: 64.54, 72.46) and was significantly higher among females [74.1% (95%CI: 70.02, 77.84)] **(Table 3.6.9)**. About 81.5% (95%CI: 75.14, 86.52) and 87.1% (95%CI: 83.70, 89.93) 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 49.5% (95%CI: 42.45, 56.52) washed hands with running water before eating at school, which was significantly higher among Malays [58.8% (95%CI: 52.35, 64.90)] **(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

1. World Health Organization. (2022, October 10). Fact Sheets on Oral Health: WHO Response. Retrieved from https://www.who.int/news-room/fact-sheets/detail/oral-health
2. Calderon S, Mallory C. Look at My Pearly White Teeth: Exploring Adolescents' Oral Health Behavior. Public Health Nurs. 2018; 1-8
3. Malaysian Dental Association. General Oral Health Care, Question 3: Teeth for Life? [Online]. 2020 [Updated 18 April 2020]. https://web.mda.org.my/questions-3-teeth-for-life-contributed-by-prof-dr-ishak-abdul-razak/. Accessed on 13 October 2022
4. Habib R. Effect of Hand Washing Practices and Prevalence of Related Diseases among Primary School Children in Tehsil Lalian, District Chiniot, Pakistan. PriMera Scientific Medicine and Public Health. 2022;1:15-26

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

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
JOHOR	80	10177	3.9	2.94	5.20
Sex					
Male	43	5588	4.3	2.68	6.72
Female	37	4589	3.6	2.59	4.87
Form					
Form 1	16	2109	3.7	1.98	6.73
Form 2	18	2272	4.3	2.44	7.41
Form 3	18	2685	5.1	2.91	8.70
Form 4	15	1658	3.4	1.79	6.27
Form 5	13	1454	3.0	1.63	5.62
Ethnicity					
Malay	47	6301	3.7	2.55	5.25
Chinese	28	3280	5.1	3.31	7.71
Indian	3	-	-	-	-
Bumiputera Sabah	0	-	-	-	-
Bumiputera Sarawak	0	-	-	-	-
Others	2	-	-	-	-

- 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 Johor, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
JOHOR	1641	212884	81.9	79.03	84.39
Sex					
Male	795	102288	78.0	73.39	82.06
Female	846	110596	85.8	82.63	88.39
Form					
Form 1	332	45339	79.1	72.62	84.37
Form 2	315	41966	79.2	74.08	83.49
Form 3	287	42759	80.9	74.42	86.03
Form 4	355	41260	83.9	79.22	87.72
Form 5	352	41560	87.1	82.10	90.91
Ethnicity					
Malay	1077	144125	83.9	80.25	87.03
Chinese	411	49285	76.3	71.46	80.48
Indian	131	16751	83.9	77.57	88.66
Bumiputera Sabah	3	380	75.4	19.36	97.50
Bumiputera Sarawak	12	1544	75.0	46.04	91.33
Others	7	799	68.3	24.11	93.57

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

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
JOHOR	159	19908	7.7	6.17	9.46
Sex					
Male	98	12129	9.3	6.88	12.33
Female	61	7779	6.0	4.66	7.77
Form					
Form 1	37	4835	8.4	5.54	12.65
Form 2	30	3981	7.5	4.92	11.30
Form 3	25	3749	7.1	4.44	11.14
Form 4	33	3523	7.2	4.42	11.42
Form 5	34	3819	8.0	5.03	12.51
Ethnicity					
Malay	68	9133	5.3	4.13	6.82
Chinese	87	10285	15.9	13.69	18.43
Indian	3	-	-	-	-
Bumiputera Sabah	0	-	-	-	-
Bumiputera Sarawak	0	-	-	-	-
Others	1	-	-	-	-

- Prevalence with high RSE, not reported

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

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
JOHOR	1003	128568	49.5	41.69	57.26
Sex					
Male	525	66912	51.0	41.84	60.18
Female	478	61656	47.9	39.15	56.68
Form					
Form 1	206	27394	47.8	36.71	59.09
Form 2	216	28716	54.2	42.49	65.41
Form 3	202	30161	57.1	46.77	66.76
Form 4	193	21423	43.7	33.59	54.32
Form 5	186	20874	43.8	32.03	56.24
Ethnicity					
Malay	500	68161	39.7	34.44	45.25
Chinese	437	52014	80.5	74.97	85.03
Indian	50	6415	32.1	21.21	45.41
Bumiputera Sabah	2	-	-	-	-
Bumiputera Sarawak	7	-	-	-	-
Others	7	808	69.0	38.43	88.84

- Prevalence with high RSE, not reported

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

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
JOHOR	386	50295	19.3	16.94	21.99
Sex					
Male	168	21617	16.5	12.79	21.00
Female	218	28678	22.2	19.17	25.64
Form					
Form 1	100	13703	23.9	18.29	30.60
Form 2	85	11533	21.8	15.92	29.00
Form 3	66	9637	18.2	13.68	23.88
Form 4	72	8387	17.1	13.77	20.94
Form 5	63	7035	14.7	11.21	19.17
Ethnicity					
Malay	228	31022	18.1	15.47	20.99
Chinese	98	11596	17.9	15.11	21.17
Indian	55	7044	35.3	25.95	45.86
Bumiputera Sabah	2	-	-	-	-
Bumiputera Sarawak	2	-	-	-	-
Others	1	-	-	-	-

- Prevalence with high RSE, not reported

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

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
JOHOR	539	70111	27.0	21.04	33.86
Sex					
Male	257	33507	25.6	18.95	33.57
Female	282	36604	28.4	21.39	36.60
Form					
Form 1	125	17228	30.1	21.09	41.00
Form 2	96	12988	24.5	17.30	33.49
Form 3	79	12000	22.7	17.22	29.31
Form 4	124	14536	29.6	21.80	38.72
Form 5	115	13360	28.0	20.37	37.17
Ethnicity					
Malay	351	47000	27.4	21.17	34.59
Chinese	141	17090	26.4	17.40	38.02
Indian	43	5451	27.3	14.66	45.07
Bumiputera Sabah	2	-	-	-	-
Bumiputera Sarawak	2	-	-	-	-
Others	0	-	-	-	-

- Prevalence with high RSE, not reported

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

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
JOHOR	82	10915	7.7	5.67	10.38
Sex					
Male	48	6388	8.8	5.75	13.23
Female	34	4527	6.6	4.57	9.33
Form					
Form 1	21	2924	8.8	5.50	13.93
Form 2	10	-	-	-	-
Form 3	15	2275	8.3	4.84	13.95
Form 4	20	2357	8.7	5.07	14.48
Form 5	16	-	-	-	-
Ethnicity					
Malay	63	8498	9.3	6.37	13.30
Chinese	5	-	-	-	-
Indian	12	1509	9.7	5.67	16.17
Bumiputera Sabah	0	-	-	-	-
Bumiputera Sarawak	0	-	-	-	-
Others	2	-	-	-	-

- Prevalence with high RSE, not reported

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

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
JOHOR	588	76406	29.4	26.47	32.53
Sex					
Male	230	29744	22.7	20.51	25.13
Female	358	46663	36.2	30.58	42.18
Form					
Form 1	115	15391	26.9	22.84	31.44
Form 2	121	16218	30.6	25.28	36.48
Form 3	103	15715	29.7	23.12	37.30
Form 4	124	14772	30.0	24.54	36.20
Form 5	125	14311	30.1	26.49	33.92
Ethnicity					
Malay	441	58886	34.3	31.05	37.75
Chinese	124	14608	22.6	16.67	29.98
Indian	15	-	-	-	-
Bumiputera Sabah	1	-	-	-	-
Bumiputera Sarawak	4	-	-	-	-
Others	3	-	-	-	-

- 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 Johor, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95% CI	
				Lower	Upper
JOHOR	1380	178491	68.6	64.54	72.46
Sex					
Male	647	82894	63.2	57.09	68.99
Female	733	95597	74.1	70.02	77.84
Form					
Form 1	257	35002	61.1	54.36	67.37
Form 2	252	33591	63.4	56.58	69.67
Form 3	240	35936	68.0	61.06	74.19
Form 4	317	37082	75.4	70.16	80.02
Form 5	314	36881	77.3	70.50	82.95
Ethnicity					
Malay	919	122447	71.3	66.75	75.47
Chinese	311	37053	57.3	53.28	61.29
Indian	132	16736	83.8	75.40	89.72
Bumiputera Sabah	3	380	75.4	19.36	97.50
Bumiputera Sarawak	10	1309	63.6	38.62	82.89
Others	5	566	48.3	24.85	72.58

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

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
JOHOR	1620	211937	81.5	75.14	86.52
Sex					
Male	802	104224	79.5	71.70	85.60
Female	818	107714	83.5	76.67	88.65
Form					
Form 1	333	45657	79.6	71.96	85.65
Form 2	297	40027	75.5	67.65	81.98
Form 3	291	43757	82.8	75.63	88.15
Form 4	361	42282	86.0	78.04	91.39
Form 5	338	40215	84.3	73.98	91.04
Ethnicity					
Malay	1127	150990	87.9	84.12	90.92
Chinese	333	40559	62.8	52.96	71.61
Indian	138	17670	88.5	80.63	93.40
Bumiputera Sabah	4	-	-	-	-
Bumiputera Sarawak	11	1415	68.7	47.19	84.36
Others	7	799	68.3	24.11	93.57

- Prevalence with high RSE, not reported

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 Johor, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
JOHOR	1758	226500	87.1	83.70	89.93
Sex					
Male	871	111107	84.8	80.46	88.37
Female	887	115393	89.5	85.90	92.22
Form					
Form 1	353	47802	83.6	77.81	88.04
Form 2	337	44493	83.9	75.04	90.08
Form 3	309	46214	87.4	84.17	90.09
Form 4	391	45079	91.7	87.16	94.72
Form 5	368	42912	90.0	84.95	93.44
Ethnicity					
Malay	1081	144181	84.0	79.21	87.79
Chinese	507	60600	93.9	91.97	95.44
Indian	144	18508	92.7	87.51	95.80
Bumiputera Sabah	4	-	-	-	-
Bumiputera Sarawak	15	1915	93.0	63.54	99.03
Others	7	792	67.6	30.55	90.84

- Prevalence with high RSE, not reported

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

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
JOHOR	979	128269	49.5	42.45	56.52
Sex					
Male	461	60100	46.0	37.07	55.15
Female	518	68169	53.0	45.55	60.36
Form					
Form 1	160	21866	38.4	32.76	44.33
Form 2	179	24382	46.2	37.69	55.02
Form 3	177	26853	50.9	39.91	61.86
Form 4	223	26489	53.9	41.48	65.81
Form 5	240	28679	60.1	49.09	70.22
Ethnicity					
Malay	753	100761	58.8	52.35	64.90
Chinese	183	22147	34.4	25.96	43.96
Indian	37	4636	23.5	17.06	31.45
Bumiputera Sabah	1	-	-	-	-
Bumiputera Sarawak	4	-	-	-	-
Others	1	-	-	-	-

- 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, 14.2% (95%CI: 12.43, 16.08) of adolescents in Johor reported feeling lonely "most of the time or always" **(Table 3.7.1).** A total of 12.3% (95%CI: 10.52, 14.28) 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 11.6% (95%CI: 10.42, 12.80), 8.6% (95%CI: 7.30, 10.17), and 9.1% (95%CI: 7.42, 11.16), respectively **(Table 3.7.3)**, **(Table 3.7.4) (Table 3.7.5).** The survey also observed that 3.7% (95% CI: 2.99, 4.53) 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 Johor (11.6%) was higher than GSHS 2012 (11.3%) and GSHS 2017 (7.5%). However, this figure was lower in comparison to national prevalence of 13.1%. Prevalence of suicidal plan in this survey (8.6%) was also higher compared to the prevalence in GSHS 2012 (8.1%) and GSHS 2017 (5.7%). Nonetheless, this prevalence was lower compared to the national prevalence of 10.0%. Prevalence of suicidal attempts in this survey (9.1%) was reported lower compared to the prevalence in GSHS 2012 (9.7%), but higher than GSHS 2017 (4.6%). This prevalence was lower compared to national prevalence (9.5%). In addition to these, more students (3.7%) in Johor reported having no close friends as compared to previous GSHS 2017 (3.1%), but lower compared to GSHS 2012 (3.9%). This figure was also 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 Johor

	NHMS 2012	NHMS 2017	NHMS 2022
Loneliness	7.1	8.9	14.2
Inability to sleep due to worry	6.4	6.5	12.3
Suicidal ideation	11.3	7.5	11.6
Suicidal plan	8.1	5.7	8.6
Suicidal attempt	9.7	4.6	9.1
Not having any close friend	3.9	3.1	3.7

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

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, 22.6% (95% CI: 19.41, 26.17) of Johor adolescents reported depression. The prevalence of depression was significantly higher in female adolescents, 31.9% (95% CI: 26.54, 37.79) compared to males, 13.5% (95% CI: 11.24,16.13) **(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. The prevalence of depression in Johor was lower 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 Johor, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
JOHOR	284	36809	14.2	12.43	16.08
Sex					
Male	99	12683	9.7	7.79	11.98
Female	185	24125	18.7	15.36	22.59
Form					
Form 1	41	5252	9.2	6.09	13.63
Form 2	65	8771	16.5	12.72	21.25
Form 3	46	6949	13.1	10.11	16.92
Form 4	59	7153	14.5	11.04	18.93
Form 5	73	8683	18.2	13.86	23.54
Ethnicity					
Malay	209	27682	16.1	13.72	18.90
Chinese	51	6039	9.3	6.79	12.68
Indian	20	2559	12.8	7.48	21.10
Bumiputera Sabah	2	-	-	-	-
Bumiputera Sarawak	1	-	-	-	-
Others	1	-	-	-	-

- 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 Johor, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
JOHOR	251	31942	12.3	10.52	14.28
Sex					
Male	96	11591	8.8	6.90	11.27
Female	155	20351	15.8	12.92	19.10
Form					
Form 1	34	4547	7.9	5.27	11.76
Form 2	42	5470	10.3	7.02	14.86
Form 3	51	7615	14.4	9.91	20.47
Form 4	59	6662	13.5	10.92	16.70
Form 5	65	7648	16.0	12.41	20.47
Ethnicity					
Malay	176	22965	13.4	11.10	16.02
Chinese	53	6088	9.4	6.83	12.80
Indian	16	2124	10.6	6.82	16.21
Bumiputera Sabah	1	-	-	-	-
Bumiputera Sarawak	2	-	-	-	-
Others	3	-	-	-	-

- Prevalence with high RSE, not reported

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

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
JOHOR	233	30075	11.6	10.42	12.80
Sex					
Male	67	8152	6.2	4.76	8.09
Female	166	21923	17.0	13.93	20.55
Form					
Form 1	36	4694	8.2	6.03	11.03
Form 2	55	7530	14.2	9.47	20.67
Form 3	38	5656	10.7	6.79	16.45
Form 4	49	5816	11.8	8.27	16.65
Form 5	55	6379	13.4	10.46	16.95
Ethnicity					
Malay	157	20998	12.2	10.62	14.04
Chinese	63	7532	11.6	9.34	14.39
Indian	9	-	-	-	-
Bumiputera Sabah	1	-	-	-	-
Bumiputera Sarawak	0	-	-	-	-
Others	3	-	-	-	-

- Prevalence with high RSE, not reported

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

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
JOHOR	172	22450	8.6	7.30	10.17
Sex					
Male	51	6417	4.9	3.63	6.57
Female	121	16033	12.4	9.41	16.22
Form					
Form 1	29	3890	6.8	4.84	9.43
Form 2	43	5873	11.1	7.79	15.45
Form 3	26	3882	7.3	4.38	12.06
Form 4	33	3986	8.1	5.49	11.83
Form 5	41	4818	10.1	7.04	14.29
Ethnicity					
Malay	124	16677	9.7	7.88	11.92
Chinese	34	4024	6.2	4.72	8.14
Indian	11	1378	6.9	4.22	11.07
Bumiputera Sabah	1	-	-	-	-
Bumiputera Sarawak	1	-	-	-	-
Others	1	-	-	-	-

- 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 Johor, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
JOHOR	180	23714	9.1	7.42	11.16
Sex					
Male	59	7526	5.7	4.10	7.99
Female	121	16188	12.6	9.77	15.99
Form					
Form 1	37	5015	8.7	5.64	13.32
Form 2	35	4731	8.9	6.31	12.48
Form 3	34	5058	9.6	5.83	15.31
Form 4	41	4946	10.1	6.64	14.96
Form 5	33	3964	8.3	6.08	11.26
Ethnicity					
Malay	125	17121	10.0	7.92	12.49
Chinese	37	4297	6.6	4.40	9.89
Indian	13	1646	8.2	4.57	14.43
Bumiputera Sabah	1	-	-	-	-
Bumiputera Sarawak	1	-	-	-	-
Others	3	-	-	-	-

- Prevalence with high RSE, not reported

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

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
JOHOR	72	9584	3.7	2.99	4.53
Sex					
Male	37	5084	3.9	2.87	5.23
Female	35	4500	3.5	2.62	4.62
Form					
Form 1	19	2644	4.6	3.16	6.68
Form 2	13	1673	3.1	1.74	5.62
Form 3	15	2279	4.3	2.38	7.70
Form 4	9	1008	2.0	1.15	3.64
Form 5	16	1980	4.2	2.44	6.99
Ethnicity					
Malay	51	6863	4.0	3.12	5.11
Chinese	9	-	-	-	-
Indian	12	-	-	-	-
Bumiputera Sabah	0	-	-	-	-
Bumiputera Sarawak	0	-	-	-	-
Others	0	-	-	-	-

- Prevalence with high RSE, not reported

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

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
JOHOR	453	58564	22.6	19.41	26.17
Sex					
Male	139	17652	13.5	11.24	16.13
Female	314	40912	31.9	26.54	37.79
Form					
Form 1	69	9061	16.1	12.14	20.92
Form 2	88	11912	22.4	17.08	28.84
Form 3	85	12684	24.1	16.80	33.21
Form 4	94	11358	23.1	17.97	29.27
Form 5	117	13548	28.5	22.70	35.01
Ethnicity					
Malay	348	45942	26.9	22.78	31.44
Chinese	73	8425	13.0	9.27	18.06
Indian	22	2984	15.0	9.83	22.32
Bumiputera Sabah	1	-	-	-	-
Bumiputera Sarawak	3	-	-	-	-
Others	6	-	-	-	-

- 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 Johor.

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 Johor
ii. To identify the prevalence of active transportation or commuting among adolescents in Johor
iii. To identify the prevalence of sitting behavior among adolescents in Johor

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 20.2% (95% CI: 17.69, 22.89) among adolescents in Johor. The prevalence was significantly higher in males [23.9% (95% CI: 20.80, 27.41)] than in females [16.3% (95% CI: 13.12, 20.13)] **(Table 3.8.1).**

Active Transportation/ Commuting
Overall, 20.8% (95% CI: 13.84, 29.92) adolescents in Johor reported active transportation to school. The prevalence was higher among males [22.0% (95% CI: 12.99, 34.66)] compared to females and form 4 [29.7% (95% CI: 16.51, 47.35)] compared to the other form. **(Table 3.8.2).**

Sitting behaviour
A total of 69.9% (95% CI: 65.78, 73.65) adolescents in Johor had spent at least three hours in a typical or usual day engaging in sitting activities. The higher prevalence was observed in males [70.0% (95% CI: 65.61, 74.11)] compared to females, form 4 [79.5% (95% CI: 72.53, 85.03)] **(Table 3.8.3).**

3.8.5 Discussion / Conclusion

The prevalence of being physically active and active commuting among school adolescents in Johor was lower than national findings (20.2% vs. 21.4%, 20.8% vs. 27.0%, respectively). In addition, the prevalence of sitting behavior was higher than the national finding (69.9% vs. 66.7%). Compared to previous NHMS findings, the prevalence of being physically active in the current study was lower than in the previous Johor AHS 2017 (20.2% vs. 25.3%). The prevalence of sitting behavior among school adolescents in Johor increased from 2012 to the current survey (49.2% in 2012, 60.7% in 2017, and 69.9% 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 Johor 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 Johor

	NHMS 2012	NHMS 2017	NHMS 2022
Physical activity	19.9%	25.3%	20.2%
Active commuting	-	-	20.8%
Sitting behavior	49.2%	60.7%	69.9%

3.8.7 References

1. The World Health Organization. Physical Activity 2022 [Available from: https://www.who.int/newsroom/fact-sheets/detail/physical-activity
2. Ekelund U, Luan Ja, Sherar LB, Esliger DW, Griew P, Cooper A, et al. Moderate to vigorous physical activity and sedentary time and cardiometabolic risk factors in children and adolescents. JAMA. 2012;307(7):704-12
3. Xu G, Sun N, Li L, Qi W, Li C, Zhou M, et al. Physical behaviors of 12-15 year-old adolescents in 54 lowand middle-income countries: Results from the Global School-based Student Health Survey. J. Glob. Health. 2020;10(1)
4. Ministry of Health Malaysia. National Strategic Plan for Active Living (NASPAL) 2017-2025. Malaysia2018

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 Johor, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
JOHOR	406	52412	20.2	17.69	22.89
Sex					
Male	245	31334	23.9	20.80	27.41
Female	161	21078	16.3	13.12	20.13
Form					
Form 1	82	11093	19.4	14.73	25.10
Form 2	91	11957	22.5	17.10	29.12
Form 3	67	10096	19.1	14.84	24.23
Form 4	92	10478	21.3	17.21	26.09
Form 5	74	8788	18.4	14.36	23.32
Ethnicity					
Malay	250	33341	19.4	16.90	22.21
Chinese	79	9087	14.1	10.63	18.43
Indian	70	9090	45.5	38.30	52.93
Bumiputera Sabah	1	-	-	-	-
Bumiputera Sarawak	3	-	-	-	-
Others	3	-	-	-	-

- 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 Johor, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
JOHOR	414	53978	20.8	13.84	29.92
Sex					
Male	221	28786	22.0	12.99	34.66
Female	193	25192	19.5	13.03	28.23
Form					
Form 1	84	11254	19.7	11.49	31.62
Form 2	57	7545	14.2	11.19	17.86
Form 3	57	8736	16.5	9.73	26.67
Form 4	121	14585	29.7	16.51	47.35
Form 5	95	11859	24.9	13.28	41.69
Ethnicity					
Malay	292	39300	22.9	13.95	35.25
Chinese	84	-	-	-	-
Indian	34	-	-	-	-
Bumiputera Sabah	0	-	-	-	-
Bumiputera Sarawak	2	-	-	-	-
Others	2	-	-	-	-

- Prevalence with high RSE, not reported

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

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
JOHOR	1409	181325	69.9	65.78	73.65
Sex					
Male	719	91649	70.0	65.61	74.11
Female	690	89676	69.7	64.28	74.62
Form					
Form 1	244	32863	57.5	50.36	64.27
Form 2	257	33770	63.6	53.68	72.40
Form 3	260	39212	74.6	67.67	80.50
Form 4	336	38913	79.5	72.53	85.03
Form 5	312	36566	76.7	72.12	80.67
Ethnicity					
Malay	863	114915	67.1	61.08	72.68
Chinese	432	51683	79.9	74.72	84.25
Indian	94	12370	61.9	50.15	72.47
Bumiputera Sabah	1	-	-	-	-
Bumiputera Sarawak	11	1326	64.4	35.94	85.38
Others	8	916	78.2	40.95	94.89

- Prevalence with high RSE, not reported

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 Johor.

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 22.0% (95% CI: 18.03, 26.63). It was higher in males (22.3%, 95% CI: 17.80, 27.57) compared to females (21.8%, 95% CI: 16.88, 27.58). Truancy was highest among Form 5 students with 27.6% (95% CI: 20.99, 35.35) **(Table 3.9.1).**

Having Peer Support

The prevalence of having peer support in the past 30 days among adolescents was 44.4% (95% CI: 38.21, 50.69). It was higher in females (51.0%, 95% CI: 43.81, 58.19) compared to males (37.8%, 95% CI: 31.12, 45.00). Having peer support was highest among Form 4 students with 50.0% (95% CI: 42.44, 57.46) **(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: 9.22, 13.54). It was higher in males (11.8%, 95% CI: 9.08, 15.26) compared to females (10.6%, 95% CI: 8.62, 12.87). Having parental or guardian supervision was highest among Form 1 students with 18.1% (95% CI: 11.99, 26.29) **(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 24.6% (95% CI: 21.46, 27.96). It was higher in males (26.3%, 95% CI: 21.84, 31.33) compared to females (22.8%, 95% CI: 19.00, 27.08). Having parental or guardian connectedness was highest among Form 1 students with 28.5% (95% CI: 22.37, 35.48). **(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 34.4% (95% CI: 30.58, 38.46). It was higher in males (35.9%, 95% CI: 31.05, 41.06) compared to females (32.9%, 95% CI: 27.80, 38.45). Having parental or guardian bonding was highest among Form 4 students with 39.4% (95% CI: 33.59, 45.47) **(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 80.8% (95% CI: 78.30, 83.05). It was higher in males (81.0%, 95% CI: 77.85, 83.84) compared to females (80.5%, 95% CI: 76.26, 84.21). Having parental or guardian respect for privacy was highest among Form 5 students with 83.6% (95% CI: 80.00, 86.66) **(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 Johor

	NHMS 2012	NHMS 2017	NHMS 2022
Truancy	28.8	24.2	22.0
Having peer support	37.9	49.9	44.4
Having parental or guardian supervision	14.0	12.3	11.2
Having parental or guardian connectedness	30.3	34.9	24.6
Having parental or guardian bonding	41.8	51.0	34.4
Having parental or guardian respect for privacy	72.6	77.6	80.8

3.9.7 References

1. Anthony, E. K., & Stone, S. I. (2010). Individual and contextual correlates of adolescent health and well-being. *Families in Society,* 91(3), 225–233. https://doi.org/10.1606/1044-3894.3999
2. Henson, M., Sabo, S., Trujillo, A., & Teufel-Shone, N. (2017). Identifying Protective Factors to Promote Health in American Indian and Alaska Native Adolescents: A Literature Review. *The journal of primary prevention*, 38(1-2), 5–26. https://doi.org/10.1007/s10935-016-0455-2

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

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
JOHOR	440	57242	22.0	18.03	26.63
Sex					
Male	226	29178	22.3	17.80	27.57
Female	214	28064	21.8	16.88	27.58
Form					
Form 1	67	9254	16.1	11.76	21.76
Form 2	71	9902	18.7	13.30	25.60
Form 3	78	11825	22.4	14.12	33.71
Form 4	114	13132	26.7	20.03	34.66
Form 5	110	13129	27.6	20.99	35.35
Ethnicity					
Malay	344	45318	26.4	21.94	31.46
Chinese	59	7146	11.1	6.64	17.85
Indian	28	3663	18.3	13.61	24.25
Bumiputera Sabah	1	-	-	-	-
Bumiputera Sarawak	4	-	-	-	-
Others	4	-	-	-	-

- Prevalence with high RSE, not reported

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

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
JOHOR	895	115119	44.4	38.21	50.69
Sex					
Male	395	49471	37.8	31.12	45.00
Female	500	65648	51.0	43.81	58.19
Form					
Form 1	161	21574	37.6	27.33	49.20
Form 2	165	22064	41.6	29.70	54.61
Form 3	163	24348	46.3	36.04	56.92
Form 4	209	24482	50.0	42.44	57.46
Form 5	197	22651	47.6	38.00	57.38
Ethnicity					
Malay	594	77853	45.5	37.96	53.21
Chinese	207	24993	38.7	30.30	47.78
Indian	87	11427	57.2	44.72	68.85
Bumiputera Sabah	2	-	-	-	-
Bumiputera Sarawak	3	-	-	-	-
Others	2	-	-	-	-

- 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 Johor, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
JOHOR	222	29043	11.2	9.22	13.54
Sex					
Male	119	15455	11.8	9.08	15.26
Female	103	13588	10.6	8.62	12.87
Form					
Form 1	75	10309	18.1	11.99	26.29
Form 2	46	6140	11.6	8.84	15.03
Form 3	33	4784	9.1	6.03	13.43
Form 4	37	4250	8.7	6.28	11.85
Form 5	31	3560	7.5	4.62	11.89
Ethnicity					
Malay	103	14197	8.3	6.95	9.88
Chinese	51	5985	9.3	6.24	13.54
Indian	62	8146	40.8	30.90	51.48
Bumiputera Sabah	2	-	-	-	-
Bumiputera Sarawak	1	-	-	-	-
Others	3	-	-	-	-

- 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 Johor, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
JOHOR	494	63753	24.6	21.46	27.96
Sex					
Male	269	34392	26.3	21.84	31.33
Female	225	29361	22.8	19.00	27.08
Form					
Form 1	118	16285	28.5	22.37	35.48
Form 2	91	12120	22.9	16.02	31.53
Form 3	82	12115	23.0	19.04	27.45
Form 4	115	13025	26.6	22.29	31.35
Form 5	88	10207	21.5	15.99	28.15
Ethnicity					
Malay	304	40326	23.6	20.35	27.09
Chinese	116	13882	21.5	16.20	27.92
Indian	68	8779	44.0	35.46	52.82
Bumiputera Sabah	2	-	-	-	-
Bumiputera Sarawak	2	-	-	-	-
Others	2	-	-	-	-

- 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 Johor, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
JOHOR	695	89235	34.4	30.58	38.46
Sex					
Male	369	46882	35.9	31.05	41.06
Female	326	42353	32.9	27.80	38.45
Form					
Form 1	142	19247	33.6	25.41	42.86
Form 2	130	17237	32.5	26.74	38.88
Form 3	120	18081	34.4	27.41	42.09
Form 4	169	19296	39.4	33.59	45.47
Form 5	134	15374	32.5	25.97	39.72
Ethnicity					
Malay	392	51692	30.2	26.27	34.42
Chinese	201	24323	37.7	31.20	44.70
Indian	95	12379	62.4	45.80	76.47
Bumiputera Sabah	2	-	-	-	-
Bumiputera Sarawak	1	-	-	-	-
Others	4	444	37.9	19.99	59.87

- 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 Johor, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
JOHOR	1618	209485	80.8	78.30	83.05
Sex					
Male	821	105732	81.0	77.85	83.84
Female	797	103753	80.5	76.26	84.21
Form					
Form 1	336	45840	80.0	75.33	83.92
Form 2	306	40805	77.1	71.18	82.15
Form 3	290	43341	82.4	77.88	86.16
Form 4	347	39813	81.2	73.06	87.35
Form 5	339	39686	83.6	80.00	86.66
Ethnicity					
Malay	1027	138143	80.7	77.59	83.44
Chinese	458	54615	84.7	80.47	88.07
Indian	112	14095	71.0	59.05	80.63
Bumiputera Sabah	4	-	-	-	-
Bumiputera Sarawak	11	1396	67.8	30.12	91.13
Others	6	733	62.6	39.13	81.30

- 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 Johor was 7.6% (95% CI: 6.10, 9.55), male adolescents showed significantly higher prevalence 8.7% (95% CI: 6.55, 11.45) compared to females, 6.6% (95% CI: 4.57, 9.38) **(Table 3.10.1)**. Prevalence of current sexual intercourse among adolescents in Johor was 5.9% (95% CI: 4.81, 7.22), male adolescents had higher prevalence of currently having sexual intercourse which was 7.0% (95% CI: 5.15, 9.44) compared to female; 4.8% (95% CI: 3.40, 6.71**) (Table 3.10.2).** Of those who ever had sex, 29.1% had sex before the age of 14. It was noted that 13.3% those who had at least two sexual partners and 12.2% of them used other birth control methods. While 9.8% 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 person get HIV from mosquito bites?" with 29.6. "Can a healthy-looking person have HIV?" with percentage 27.5%. Followed by question "Can a person get HIV by sharing food with someone who is infected?" with 18.8% and 18.6% for "Can a person reduce the risk of getting HIV using a condom every time they have sex. While the least 12.3% 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
2. WHO fact sheet: Adolescent pregnancy. 2022. https://www.who.int/news-room/fact-sheets/detail/adolescent-pregnancy
3. Lindberg LD, Firestein L, Beavin C. Trends in U.S. adolescent sexual behavior and contraceptive use, 2006-2019. Contracept X. 2021 Apr 8; 3:100064
4. T Carine Ronsmans, Wendy J Graham, on behalf of The Lancet Maternal Survival Series steering group, 2006. Maternal mortality: who, when, where, and why. The Lancet's Maternal Survival and Women Deliver Series 2006/2007: 2005 World Health Report
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 Johor, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
JOHOR	150	19854	7.6	6.10	9.55
Sex					
Male	86	11381	8.7	6.55	11.45
Female	64	8474	6.6	4.57	9.38
Form					
Form 1	54	7593	13.2	8.09	20.94
Form 2	24	3058	5.8	3.83	8.61
Form 3	20	3056	5.8	3.76	8.79
Form 4	30	3453	7.0	4.60	10.65
Form 5	22	2694	5.7	3.34	9.47
Ethnicity					
Malay	97	13196	7.7	5.90	10.01
Chinese	27	3326	5.1	3.79	6.93
Indian	21	2713	13.6	7.65	22.98
Bumiputera Sabah	1	-	-	-	-
Bumiputera Sarawak	2	-	-	-	-
Others	2	-	-	-	-

- Prevalence with high RSE, not reported

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

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
JOHOR	115	15326	5.9	4.81	7.22
Sex					
Male	69	9154	7.0	5.15	9.44
Female	46	6172	4.8	3.40	6.71
Form					
Form 1	39	5416	9.4	5.77	15.09
Form 2	20	2616	4.9	3.15	7.65
Form 3	17	2634	5.0	3.14	7.81
Form 4	23	2712	5.5	3.08	9.75
Form 5	16	1947	4.1	2.32	7.15
Ethnicity					
Malay	74	10016	5.8	4.42	7.70
Chinese	22	2764	4.3	3.07	5.92
Indian	16	-	-	-	-
Bumiputera Sabah	1	-	-	-	-
Bumiputera Sarawak	1	-	-	-	-
Others	1	-	-	-	-

- Prevalence with high RSE, not reported

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

Sexual Practices	Unweighted count	Percentage (%)
Percentage of first sex before the age 14 years	44	29.1
Percentage of having at least two sexual partners	19	13.3
Percentage of reported condom use during last sexual intercourse	15	9.8
Percentage of reported using other birth control method during last sexual intercourse	18	12.2

Table 3.10.4: Percentage of Correct Responses by item of UNGASS Indicator among adolescents in Johor, 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?	252	12.3
Can a person reduce the risk of getting HIV using a condom every time they have sex?	388	18.6
Can a healthy-looking person have HIV?	574	27.5
Can a person get HIV from mosquito bites?	606	29.6
Can a person get HIV by sharing food with someone who is infected?	385	18.8

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 Johor, specifically.

3.11.2 Objectives

General objective:

To determine the use of tobacco among adolescents in Johor.

Specific objectives:

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

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 Johor, the prevalence of current use of any tobacco products was 17.9% (95%CI: 13.02, 24.03) and it was almost four times higher in males [28.1% (95%CI: 19.54, 38.55)] than females [7.5% (95%CI: 5.30, 10.54)] **(Table 3.11.1)**. The prevalence of current smokers in Johor was 8.5% (95%CI: 6.08, 11.81) with male have prevalence more than four times higher compared to female 13.9% (95%CI: 9.30, 20.30) vs. 3.0% (95%CI: 1.83, 5.03) **(Table 3.11.2)**, while the current cigarettes smoker prevalence was 6.4% (95%CI: 4.15, 9.87) **(Table 3.11.3)**. The prevalence of the e-cig/vape user among adolescents in Johor was 15.7% (95%CI: 11.13, 21.57) with males have almost five times higher prevalence compared to females [25.7% (95%CI: 17.66, 35.80) vs. 5.5% (95%CI: 3.47, 8.49)] **(Table 3.11.4)**.

Most of the cigarettes obtained by buying them from static premises (44.1%) and getting it from friends (34.7%) **(Table 3.11.5)**. Most of the e-cig/vape were obtained by buying it from e-cig/vape shops (37.4%) and by getting it from friends (36.4%) **(Table 3.11.6)**. Almost half of the adolescents [46.8% (95%CI: 41.80, 51.89)] reported they have parent or guardian who smoked or used any type of tobacco products, with half of them [20.9% (95%CI: 17.20, 25.08)] reported they have e-cig/vape used parent or guardians, while 47.0% (95%CI: 42.87, 51.25) of the adolescents reported they're exposed to second-hand smoke when someone else smoking nearby in their presence within the past 7 days **(Table 3.11.7)**. One-fifth of the adolescents claimed they're exposed to the tobacco products point-of-sale advertising and promotion for the past 30 days [21.0% (95%CI: 18.25, 23.94)] **(Table 3.11.8)**.

3.11.5 Discussion / Conclusion

The prevalence of tobacco use among adolescents in Johor 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 Johor 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

1. Tobacco Control Sector and FCTC Secretariat, 2021. National Strategic Plan for The Control of Tobacco & Smoking Products 2021-2030. Ministry of Health Malaysia
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 any tobacco use among adolescents in Johor, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
JOHOR	350	46499	17.9	13.02	24.03
Sex					
Male	276	36801	28.1	19.54	38.55
Female	74	9699	7.5	5.30	10.54
Form					
Form 1	50	7168	12.5	8.19	18.62
Form 2	63	8468	15.9	11.52	21.63
Form 3	65	10138	19.2	12.21	28.82
Form 4	84	9350	19.0	10.58	31.79
Form 5	88	11376	23.9	14.17	37.27
Ethnicity					
Malay	288	38997	22.7	16.31	30.70
Chinese	39	4607	7.1	5.57	9.05
Indian	17	2141	10.7	7.09	15.88
Bumiputera Sabah	1	-	-	-	-
Bumiputera Sarawak	3	-	-	-	-
Others	2	-	-	-	-

- Prevalence with high RSE, not reported

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

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
JOHOR	169	22168	8.5	6.08	11.81
Sex					
Male	138	18234	13.9	9.30	20.30
Female	31	3934	3.0	1.83	5.03
Form					
Form 1	25	3487	6.1	3.60	10.10
Form 2	30	3800	7.2	4.60	10.96
Form 3	31	4768	9.0	5.47	14.51
Form 4	35	-	-	-	-
Form 5	48	6226	13.1	7.80	21.04
Ethnicity					
Malay	125	16743	9.7	6.35	14.69
Chinese	28	3346	5.2	3.93	6.76
Indian	12	1559	7.8	5.22	11.51
Bumiputera Sabah	0	-	-	-	-
Bumiputera Sarawak	2	-	-	-	-
Others	2	-	-	-	-

- Prevalence with high RSE, not reported

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

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
JOHOR	126	16716	6.4	4.15	9.87
Sex					
Male	110	14709	11.2	6.80	18.03
Female	16	-	-	-	-
Form					
Form 1	15	2139	3.7	2.09	6.63
Form 2	18	2309	4.4	2.41	7.80
Form 3	25	3865	7.3	4.07	12.85
Form 4	27	-	-	-	-
Form 5	41	5296	11.1	6.50	18.42
Ethnicity					
Malay	101	13493	7.9	4.64	13.05
Chinese	15	1867	2.9	1.88	4.43
Indian	6	-	-	-	-
Bumiputera Sabah	0	-	-	-	-
Bumiputera Sarawak	2	-	-	-	-
Others	2	-	-	-	-

- Prevalence with high RSE, not reported

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

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
JOHOR	306	40728	15.7	11.13	21.57
Sex					
Male	253	33683	25.7	17.66	35.80
Female	53	7045	5.5	3.47	8.49
Form					
Form 1	43	6239	10.9	6.50	17.68
Form 2	54	7173	13.5	9.37	19.07
Form 3	60	9364	17.7	11.07	27.13
Form 4	77	8511	17.3	9.45	29.57
Form 5	72	9441	19.8	10.99	33.03
Ethnicity					
Malay	249	33858	19.7	13.55	27.78
Chinese	37	4346	6.7	5.26	8.53
Indian	14	1769	8.9	6.04	12.81
Bumiputera Sabah	1	-	-	-	-
Bumiputera Sarawak	3	-	-	-	-
Others	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 Johor, 2022

Socio-demographic characteristics	Unweighted count	Percentage (%)
Bought from static premises	62	44.1
Bought from non-static premises	9	-
Food establishment	3	-
Bought online	5	-
Get from friends	48	34.7
Get from family members	4	-
Got some other ways	8	5.7

- 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 Johor, 2022

Socio-demographic characteristics	Unweighted count	Percentage (%)
Bought from specific e-cig/vape shop	99	37.4
Bought from pharmacy	7	-
Bought from specific non-static premises	20	-
Bought online	16	-
Got from friends	97	36.4
Got from family member	10	-
Got some other ways	15	5.6

- Prevalence with high RSE, not reported

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

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
Having parent or guardian who smoked/used any type of tobacco products	880	116113	46.8	41.80	51.89
Having e-cigarette/vape use parent or guardian	385	51016	20.9	17.20	25.08
Someone smoking nearby in the presence of respondent in the past 7 days	938	122264	47.0	42.87	51.25

Table 3.11.8: Prevalence of currently see or notice any tobacco products advertising or promotion in the past 30 days among adolescents in Johor, 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	419	54503	21.0	18.25	23.94

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 13.8% (95% CI: 11.55, 16.45) and this was higher in male [15.7% (95% CI: 13.02, 18.93)] compared to female [11.9% (95% CI: 8.81, 15.75)]. **(Table 3.12.1).** Overall, 15.4% (95% CI: 13.42, 17.55) adolescents claimed to have been involved in a physical fight, which was significantly higher in male [18.5% (95% CI: 16.15, 21.06)] compared to female [12.2% (95% CI: 9.18, 16.05)]. **(Table 3.12.1).**

The prevalence of adolescents who had a serious injury in the past 12 months was 18.8% (95% CI: 15.85, 22.21). Male adolescents showed a higher prevalence [21.0% (95% CI: 16.65, 26.15)] compared to female [16.6% (95% CI: 13.53, 20.22)]. **(Table 3.12.2).** However, among those who had been seriously injured, the two most common causes of serious injury were falls [6.6% (95% CI: 5.11, 8.45)] and motor vehicle accidents [3.7% (95% CI: 2.24, 6.22)]. **(Table 3.12.3).**

The prevalence of adolescents reported had experienced physical abuse at home was 6.5% (95% CI: 4.77, 8.69) which was higher among female at 8.3% (95% CI: 5.38, 12.50) compared to male at 4.7% (95% CI: 3.35, 6.48)]. **(Table 3.12.4).** Overall, 38.8% (95% CI: 33.52, 44.37) adolescents reported being abused verbally at home and it was significantly higher among female [50.6% (95% CI: 42.78, 58.48)] compared to male [27.2% (95% CI: 22.93, 31.85)]. **(Table 3.12.4).**

In terms of bullying, 8.3% (95% CI: 6.24, 10.86) adolescents reported having been bullied. This was higher among male [9.3% (95% CI: 6.67, 12.85)] compared to female [7.2% (95% CI: 4.76, 10.72)]. **(Table 3.12.5).** The most common

form of bullying was, 'Making fun of how my body or face looks' [1.6% (95% CI: 1.05, 2.38)]. **(Table 3.12.6).**

With regards to involvement in cyberbullying activities from the perspective of the perpetrator, 17.4% (95% CI: 14.89, 20.34) of adolescents reported that they had been involved in cyberbullying activities a few times within the past year or more. Male adolescents showed a significantly higher prevalence [21.8% (95% CI: 18.54, 25.41)] compared to female [13.0% (95% CI: 10.60, 15.96)]. **(Table 3.12.7).** The two most common forms of adolescents' involvement in cyberbullying activities were 'Ever made rude comments to anyone online' [10.1% (95% CI: 8.59, 11.82)] and 'Ever spread rumours about someone online' [6.8% (95% CI: 5.32, 8.63)]. **(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

1. WHO. (2022) Fact sheet: Adolescent and young adult health.
2. Garstang, J. et al. (2020) Effect of COVID-19 lockdown on child protection medical assessments: A retrospective observational study in Birmingham, UK. BMJ Open 10, 1–6.
3. Vaillancourt, T. et al. (2021) School bullying before and during COVID-19: Results from a population based randomized design. Aggress. Behav. 47, 557–569.

Table 3.12.1: Prevalence of involvement in violence at least once in the past 12 months among adolescents in Johor, 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
JOHOR	278	35926	13.8	11.55	16.45	307	39968	15.4	13.42	17.55
Sex										
Male	162	20641	15.7	13.02	18.93	187	24225	18.5	16.15	21.06
Female	116	15285	11.9	8.81	15.75	120	15743	12.2	9.18	16.05
Form										
Form 1	71	9536	16.6	12.38	21.99	65	8890	15.5	13.33	17.97
Form 2	65	8677	16.4	12.24	21.55	86	11211	21.1	16.23	27.07
Form 3	35	5152	9.7	6.61	14.13	44	6634	12.5	8.69	17.80
Form 4	66	7520	15.3	12.15	19.08	70	8169	16.6	11.97	22.61
Form 5	41	5041	10.6	6.03	17.88	42	5064	10.6	7.08	15.63
Ethnicity										
Malay	186	24788	14.4	11.91	17.42	198	26433	15.4	13.28	17.80
Chinese	69	8177	12.6	9.03	17.39	75	9229	14.3	11.26	17.88
Indian	18	2363	11.8	6.24	21.31	27	3435	17.2	9.49	29.14
Bumiputera Sabah	0	-	-	-	-	0	-	-	-	-
Bumiputera Sarawak	1	-	-	-	-	3	-	-	-	-
Others	4	-	-	-	-	4	-	-	-	-

- 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 Johor, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
JOHOR	373	48925	18.8	15.85	22.21
Sex					
Male	210	27506	21.0	16.65	26.15
Female	163	21420	16.6	13.53	20.22
Form					
Form 1	74	10190	17.8	14.28	21.91
Form 2	71	9501	17.9	14.07	22.56
Form 3	70	10414	19.7	13.53	27.78
Form 4	83	9601	19.5	12.53	29.14
Form 5	75	9219	19.4	13.10	27.73
Ethnicity					
Malay	259	34683	20.2	15.86	25.44
Chinese	75	9015	13.9	12.28	15.74
Indian	29	3916	19.6	10.45	33.77
Bumiputera Sabah	1	-	-	-	-
Bumiputera Sarawak	5	-	-	-	-
Others	4	-	-	-	-

- 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 Johor, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
In a motor vehicle accident or hit by a motor vehicle	64	8673	3.7	2.24	6.22
Fell	117	15238	6.6	5.11	8.45
Something fell or hit him/her	19	2326	1.0	0.64	1.58
Attacked of abused or fighting with someone	13	1716	0.7	0.42	1.30
In a fire or too near a flame or something hot	6	-	-	-	-
Inhaled or swallowed something bad	2	-	-	-	-

- 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 Johor, 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
JOHOR	128	16784	6.5	4.77	8.69	765	100886	38.8	33.52	44.37
Sex										
Male	47	6122	4.7	3.35	6.48	275	35568	27.2	22.93	31.85
Female	81	10662	8.3	5.38	12.50	490	65318	50.6	42.78	58.48
Form										
Form 1	29	3790	6.6	4.46	9.70	110	15006	26.2	20.96	32.17
Form 2	36	4944	9.3	6.04	14.12	159	21975	41.5	32.07	51.50
Form 3	21	3073	5.8	3.27	10.14	141	21235	40.2	32.95	47.84
Form 4	20	2451	5.0	2.69	9.04	186	22510	45.8	37.77	54.02
Form 5	22	2526	5.3	3.16	8.78	169	20160	42.4	35.12	49.96
Ethnicity										
Malay	84	11105	6.5	4.12	10.03	624	83648	48.8	45.61	51.96
Chinese	25	3110	4.8	3.35	6.84	96	11432	17.7	14.95	20.73
Indian	13	1761	8.8	6.08	12.62	32	4181	20.9	11.31	35.48
Bumiputera Sabah	0	-	-	-	-	2	-	-	-	-
Bumiputera Sarawak	2	-	-	-	-	6	-	-	-	-
Others	4	-	-	-	-	5	-	-	-	-

- 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 Johor, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
JOHOR	161	21462	8.3	6.24	10.86
Sex					
Male	90	12192	9.3	6.67	12.85
Female	71	9270	7.2	4.76	10.72
Form					
Form 1	47	6535	11.4	7.60	16.75
Form 2	40	5436	10.3	6.78	15.22
Form 3	21	3265	6.2	3.84	9.78
Form 4	28	3228	6.6	4.24	10.03
Form 5	25	2998	6.3	4.15	9.50
Ethnicity					
Malay	112	15332	8.9	6.12	12.90
Chinese	29	3536	5.5	3.95	7.50
Indian	15	1937	9.7	7.38	12.65
Bumiputera Sabah	0	-	-	-	-
Bumiputera Sarawak	2	-	-	-	-
Others	3	-	-	-	-

- 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 Johor, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
Hit, kicked, pushed, shoved around or locked indoor	7	-	-	-	-
Made fun of race, nationality or color	10	-	-	-	-
Made fun because of religion	4	-	-	-	-
Made fun with sexual jokes, comments of gestures	28	3714	1.5	1.16	1.94
Left out activities on purpose of completely ignored	20	2610	1.1	0.63	1.75
Made fun of how body or face looks	30	3918	1.6	1.05	2.38

- 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 Johor, 2022

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
JOHOR	351	45392	17.4	14.89	20.34
Sex					
Male	222	28548	21.8	18.54	25.41
Female	129	16844	13.0	10.60	15.96
Form					
Form 1	55	7418	12.9	10.13	16.40
Form 2	69	9166	17.3	13.22	22.19
Form 3	64	9654	18.3	12.76	25.45
Form 4	91	10254	20.9	15.97	26.76
Form 5	72	8898	18.7	13.27	25.59
Ethnicity					
Malay	254	33699	19.6	16.37	23.34
Chinese	86	10334	16.0	12.66	19.92
Indian	9	1096	5.5	3.06	9.66
Bumiputera Sabah	0	-	-	-	-
Bumiputera Sarawak	0	-	-	-	-
Others	2	-	-	-	-

- Prevalence with high RSE, not reported

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

Socio-demographic characteristics	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
Ever made rude comments to anyone online	205	26226	10.1	8.59	11.82
Ever sent or posted others' embarrassing photos online	82	10444	4.0	2.73	5.89
Ever spread rumours about someone online	138	17655	6.8	5.32	8.63
Ever made threatening comments to hurt someone online	35	4416	1.7	1.18	2.45
Ever asked someone to talk about sex online	29	3976	1.5	1.00	2.32
Ever asked someone to do something sexual online	15	2142	0.8	0.50	1.37

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 Johor reported that parents lost their job due to the COVID-19 pandemic was 9.0% (95% CI: 6.98, 11.63). 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, 42.6% (95% CI: 39.38, 45.84), 2.8% (95% CI: 2.03, 3.82) and 2.1% (95% CI: 1.53, 2.97), respectively. The prevalence of adolescents reported that family relationships became strained was 6.0% (95% CI: 4.81, 7.53). About 53.0% (95% CI: 49.42, 56.53) 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 56.4% (95% CI: 51.93, 60.69). **(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 Johor, 2022

Categories of COVID-19 impact	Unweighted count	Estimated population	Prevalence (%)	95 % CI	
				Lower	Upper
Parents lost job	179	23499	9.0	6.98	11.63
Family had to cut their expenses	852	110712	42.6	39.38	45.84
Family needed to move to less expensive rental house	53	7258	2.8	2.03	3.82
Family had to sell properties	45	5551	2.1	1.53	2.97
Family relationships became strain	120	15664	6.0	4.81	7.53
Family had no changes	1064	137789	53.0	49.42	56.53

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

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