

Explore knowledge, attitude and practice towards diabetes mellitus among youth in Klang Valley: A cross-sectional study

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ABSTRACT

In Malaysia, the prevalence rate of diabetes mellitus (DM) in adults has increased from 13.4% to 18.3% in 2019. DM complication involved with two categories such as nephropathy, neuropathy from microvascular and coronary artery disease of macrovascular. Youth population estimated to be more crucial in preventing DM. Therefore, in order to discover any gaps in their understanding and behavior regarding DM, it is imperative to determine the KAP level towards DM among youth in Klang Valley. A cross-sectional study was conducted by convenient respondents among youth aged 15-32 years old (n=426). The survey was adopted from a structured closed-ended questionnaire. Out of 426 respondents, (n=317, 74.4%) already aware on DM disease. The frequency of DM respondents is only 4.5% and not related to the genetic inheritance. The mean scores of the three domains were compared to determine if there is any significant difference in the means of two groups; diabetic respondents and non-diabetic respondents. A one-way ANOVA was conducted to compare the effect of knowledge, attitude and practice towards the level of age of the respondents. Results shows that significant effect of knowledge and practice on level of age at the $p < 0.05$ level [$F(2) = 7.354$, $p = 0.001$] and [$F(2) = 8.898$, $p = 0.000$] respectively. However, practice [$F(2) = 2.692$, $p = 0.069$] resulted insignificant in having the risk of DM. This indicates participants having a good knowledge and attitude but lack of practice. The predictive factors related to youth practice was they were not physically active, endangering their health at risk. In order to reduce the prevalence, they should have a good attitude and practicing toward the healthy lifestyle.

Keywords: Knowledge; attitude; diabetes mellitus and youth

INTRODUCTION

Diabetes mellitus (DM) is now a serious public health globally. According to Institute for Public Health, (2020) in Malaysia, the prevalence of diabetes was 11.2% in 2011 and raised up to 18.3% in 2019, increasing up to 68.3% for 8 years. A national survey report states that 3.6 million people in Malaysia who were 18 years old and older had diabetes in 2019 (The Star Online, 2019). Based on National Diabetes Registry 902 991 active diabetes patients reporting year for 2020 in Malaysia (Ministry of Health Malaysia, 2021). Similar to other countries, South-East Asia countries that has the highest rate of diabetes in the age range of 20-79 years old is India, Bangladesh, Sri Lanka, Nepal and Mauritius (Magliano et al., 2021). Higher risk in minority population can also occur but not because of family history or genetics,

it is influenced by dietary intake and their habits in daily life. Insulin resistance increases a person's risk for developing impaired glucose tolerance and type 2 diabetes (Wondmkun et al., 2020). Overweight and obesity has proven as a risk factor of T2DM in previous research. This could be associated with metabolic abnormalities that result in insulin resistance. DM significantly raises the risk of cardiovascular disease, which are known to be the primary cause of death in Malaysia and account for 35% of all fatalities (Ismail et al., 2023). Numerous factors, including genetics and lifestyle changes have been linked to DM. These factors include obesity, age, perceived stress, smoking, poor dietary habits, hypertension, family history, and physical inactivity (Urrutia et al., 2021).

In order to raise public awareness, DM was extensively advertised by digital media and printing by the effort of government and non-profit organization to reduce the cases of DM. It is believed that people in Malaysia having a good knowledge but improvement of awareness should be more arise in helping prevent DM (Salleh et al., 2019). Nonetheless, most of the people were aware of the risk factor and knowledge of DM but there was still lack of practice and attitude towards DM (Herath et al., 2017). However, almost 40% did not practice daily fruit intake due to the gap of social pressure, culture influence and financial access to a healthy diet (San et al., 2021). An estimated youth people in Malaysia considered important in helping reducing DM, giving supports and preventing in early stage. Therefore, a study of KAP level among youth is crucial to fill up the gaps in their knowledge, practice and attitude about DM prevention, which can be the guidance to themselves, family, elderly, and community. In these efforts of aware of their KAP can reduce and prevent the risk of DM. This will also promote positive attitudes and practices to enhance their access to medical care, improve health in their surrounding and communities.

After taking into account, it is clear that research on Youth in Malaysians understanding is necessary. Therefore, this study helps to assess on exploring existing knowledge, attitude and practice among youth of DM in Klang Valley through cross-sectional study. The KAP level of youth was analyzed using close-ended questions.

METHODOLOGY

Study design and location

This cross-sectional study design was used in this study to determine the prevalence of diabetes mellitus and association with knowledge, attitude and practice of diabetes mellitus among youth in Klang Valley. This research was conducted among Youth in the whole Klang Valley includes Federal Territory of Kuala Lumpur, Selangor district of Petaling (Shah Alam City Council, Petaling Jaya City Council and Subang Jaya City Council), Selangor district of Klang (Klang Municipal Council), Selangor district of Gombak (Selayang Municipal Council), Selangor district of Hulu Langat (Ampang Jaya Municipal Council, Kajang Municipal Council), Selangor district of Sepang (Sepang Municipal Council) and Selangor district of Kuala Langat (Kuala Langat Municipal Council).

The duration of the study started from February 2021 until December 2021 with initial pilot study was conducted from Jun 2021 until August 2021. Informed consent form was given to the respondents before they participated in this study. Ethics approval was obtained from Research and Ethic Committee, Management and Science University (MSU)(MSU-RMC-02/FR01/06/L1/046).

Experimental design

The researcher tools were used to collect data whereby self-administered questionnaire comprised of questions used to collect relevant data was answered to achieve the research objectives. All questionnaires will be adopted from a structured closed-ended questionnaire (Kim et al., 2013). In addition, questionnaires that will be used in this study consisted of 46 questions and divided into four section which are socio-demographic, knowledge, attitude and practice towards diabetes mellitus.

In the first sections of questionnaire was social demographic covered the respondent information. Total of 10 questions in this demographic information including gender, age, education background, occupation, marital status, number of children, location, "Have you ever heard about diabetes mellitus?", "Does anyone else who lives with you have diabetes?" and "Do you have diabetes?". In the knowledge sections, total of 12 questions regarding general knowledge such as symptoms, complications, testing, and risk factor. In addition, attitude was assessed through 12 questions related to adherence of DM. In practices, there were also total 12 questions were included to assess on preventive strategies of respondents including self-care, blood sugar monitoring and dietary changes. The respondent responses were evaluated to determine which practices were good and which were bad.

Response for the questions were in the form of 'Yes', 'No' or 'Don't know'. A positive and true answer was given to mark 1, don't know will be given 0.5 marks while a negative and wrong answer was not given a mark. Total marks of correct responses were then determined for each group.

Sample size

Sample size was calculated based on the total number of youths in Klang Valley. According to national transformation development, the new age range for youth starting in 2018 will be between 15 and 30 years (Khairy Jamaluddin, 2014). According to 2013 statistics, there were 9 414 100 Malaysian nationals aged 15-30 years old. This accounts for roughly 31% of the total population 29 947 000 people (Dzuhailmi et al., 2020).

Selangor is the second place of the highest percentage of youth which is 46.7%, this means there are 17 033 000 of Youth in Klang Valley (Ahmad Razak, 2019). From the total number of youth population, sample size was determined using automated Raosoft calculator (Azmin & Pardi, 2017) with the confidence level 95% distribution with 5% margins of error. Hence, the sample size was 385 respondents. The 10% of the dropout percentage was added to the sample size to reduce the sample error, which make the total sample size needed in this study around 426 respondents.

A pilot study was conducted to assess the validity and reliability of the surveys. A pilot study of structured questionnaires was conducted with a sample of fifty Malaysians to determine the challenges respondent faced in comprehending the questions.

Participants

The questionnaires were randomly distributed by using convenient sampling among youth in Klang Valley and fulfilled the inclusion criteria and willing to participate in this study were chosen as the respondents. According to Youth Policy (2014), youth is defined as those between 15 and 30 years old. Therefore, the study subjects was randomly select among youth communities at age 15 years old to 30 years old who live in the Klang Valley.

The inclusion criteria were participant age from 15 years old and 30 years old in February 2021 until December 2021 in Klang Valley. The respondents should be able to speak, read and understand in either English or Malay with conscious, orientated, and willing to participate. Both genders; female and male in Klang Valley could be the participants.

The exclusion criteria were non-Malaysians. Those who are unable to speak, read and understand English or Malay. Also, unconscious, disorientated and unwilling to participate will be excluded in this study

Data analysis

With SPSS version 21.0, the survey data were gathered, categorized, and coded before being calculated to achieve the stated goals. The sociodemographic data of the study population was defined and summarized using descriptive statistics (frequency, percentage, mean, and standard deviations). Normality test was used to assess skewness and kurtosis. Independent samples t-test or one-way ANOVA with Pearson correlation were used for the data matches parametric assumptions. Comparison test was used to determine whether between the knowledge versus among patients of diabetes mellitus, non-patients and their age of the study population. The total score of knowledge, attitude and practice was used in this comparison test. Significant was defined as a p-value less than 0.05.

RESULTS

Pilot study

A pilot study is the initial phase in the research methodology, and it is often a smaller sized study that helps plan and modify the big study (In J, 2017). Therefore, a pilot study was carried out in a small number of participants (n=50) based on Table 1. The Cronbach's alpha value for knowledge, attitude and practice was 0.766. Hence, this Cronbach alpha was indicated acceptable. The questions that have been removed was "If yes, which of the following organs are affected in diabetes?" and this Cronbach alpha exclude socio-demographic.

Table 1

Cronbach's alpha of 35 items

Cronbach's alpha	Cronbach's alpha based on standardized items	N of items
0.766	0.722	35

Notes: The values of Cronbach's Alpha were acceptable >0.7

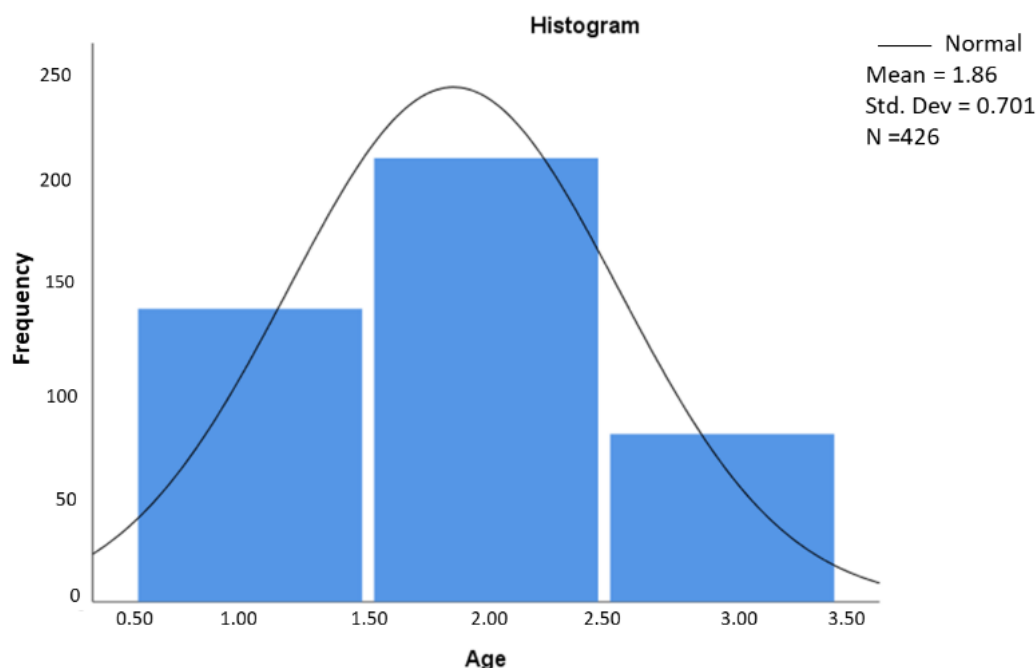
Normality test

The normality test was analysed by using the data from age group of respondents. Figure 1 shows the mean age group of respondents (N=426) was 1.86 and the standard deviation value was 0.701. Moreover, the histogram on Figure 2 shows the curve of the frequency of each respondent's age group was normal. For the test of normality, separated into two test which was skewness and kurtosis to determine normality. Based on the normality result

on Table 2, it showed the result below was normal (± 0.198). It showed the data distribution is normal due to the value of standard error of skewness within ± 1.96 .

Figure 1

Normality test according to the age



Notes: Normal curve of normality test.

Table 2

Normality test based on Skewness and Kurtosis

			Statistic	Standard error
Age	Mean		1.8615	0.03396
	95% Confidence Interval for Mean	Lower bound	1.7947	
		Upper bound	1.9283	
	5% Trimmed Mean		1.8461	
	Median		2.0000	
	Variance		0.491	
	Std. Deviation		0.70097	
	Minimum		1.00	
	Maximum		3.00	
	Range		2.00	
	Interquartile Range		1.00	
	Skewness		0.198	0.118
	Kurtosis		-0.957	0.236

Notes: Standard error of Skewness within ± 1.96 .

Socio-demographic distribution

The survey questionnaire on the KAP of diabetes mellitus (DM) among youth in Klang Valley was completed by 426 respondents. As shown in Table 3, the mean DM knowledge score was 6.8563 (SD =1.34583, range: 2.10-9.10). The mean attitude score for DM was 7.9107 (SD =1.46055, range: 3.54-11.58), indicating a positive attitude. The mean score for practice was 4.7418 (SD=2.93676, range: 0.00-11.08), indicating a good practice. Of the total sample, 301 of them were female (70.7%) and 125 (29.3%) were men. Majority of the respondents were age from 23-27 (n=209, 49.1%), while the rest of them were age from 15-22 (n=138, 32.4%) and age 28-32 (n=79, 18.5%).

Most of the respondents had bachelor or degree education level (n=196, 46.0%), followed by diploma level (n=129, 30.3%). Nearly half of the respondent was unemployed (n=183, 43.0%), part of them were working by different sector such self-employed (n=64, 15.0%), management (n= 57, 13.4%), hospitality/retail (n=40, 9.4%), healthcare (n=25, 5.9%), engineering (n=24, 5.6%), education (n=18, 4.2%) and construction (n=15, 3.5%). More of the respondent are single (n=377, 88.5%), while married (n=43, 10.1%) and divorced and widowed has the same frequency and percent (n=3, 0.7%). Number of children 1-2 (n=27, 6.3%), 3-4 (n=4, 0.9%) and >5 (n=2, 0.5%). The respondents were from different locations. Majority of the respondents come from Selangor district of Petaling (n=132, 31.0%), second highest location was Federal Territory of Kuala Lumpur (n=104, 24.4%), followed by other location in Klang Valley which was Selangor District of Hulu Langat (Ampang/Kajang) (n=52, 12.2%), Selangor District of Klang (n=40, 9.4%), Selangor District of Gombak (n=39, 9.2%), Selangor District of Sepang (n=34, 8.0%) and Selangor District of Kuala Langat (n=25, 5.9%).

Table 3

Frequency of socio-demographic characteristic distribution (N= 426)

Characteristics		Mean	SD	Min	Max	n	%
Knowledge		6.8563	1.34583	2.10	9.10		
Attitude		7.9107	1.46055	3.54	11.58		
Practice		4.7418	2.93676	0.00	11.08		
Gender	Female					301	70.7
	Male					125	29.3
Age	15-22					138	32.4
	23-27					209	49.1
	28-32					79	18.5
Education Background	Not Schooling (Unschoolled)					5	1.2
	SPM					47	11.0
	STPM/ Foundation/ O-level					34	8.0
	Diploma					129	30.3
	Degree					196	46.0
	Master					15	3.5
	PhD					0	0
Occupation	Unemployed					183	43.0
	Self-employed					64	15.0
	Construction					15	3.5
	Healthcare					25	5.9
	Management					57	13.4
	Education					18	4.2
	Engineering					24	5.6
	Hospitality					40	9.4
Marital Status	Single					377	88.5
	Married					43	10.1
	Divorced					3	.7
	Widowed					3	.7
Number of Children	No					393	92.3
	1-2					27	6.3
	3-4					4	.9
	>5					2	.5
Location	Federal Territory of Kuala Lumpur					104	24.4
	Selangor District of Petaling (Shah Alam/ Subang Jaya/ Petaling Jaya)					132	31.0
	Selangor District of Klang					40	9.4
	Selangor District of Gombak (Selayang)					39	9.2
	Selangor District of Hulu Langat (Ampang/ Kajang)					52	12.2
	Selangor District of Sepang					34	8.0
	Selangor District of Kuala Langat					25	5.9

Notes: All data are given in percentage. SD: Standard Deviation, Min: Minimum, Max: Maximum and n: Frequency.

Diabetes mellitus awareness

The information regarding diabetes mellitus awareness is shown in Table 4. The awareness of the respondent regarding DM divided into three sections; knowledge, attitude and practice. The data showed out of the 426 respondents, most of the respondents were aware on diabetes mellitus disease (n= 317, 74.4%), whereas only (n=109, 25.6%) has not heard about diabetes mellitus. Based on the objective 1, which was to determine the awareness of Type-2 diabetes mellitus patients among youth in Klang Valley and its socio-demographic.

Table 4

Frequency of information of diabetes mellitus that has heard (yes) and has not heard (no) regarding diabetes mellitus.

Parameters	Frequency (n)	Percent (%)
Have you ever heard about Diabetes Mellitus?		
Yes	317	74.4
No	109	25.6

Notes: Awareness of diabetes mellitus.

Frequency of diabetes mellitus patients among youth in Klang Valley

The diabetes mellitus distribution on three different groups of age as shown in Table 5. Out of 426 respondents, only (n=19) respondent have diabetes. 15-22 years old (n=8) and 23-27 years old (n=8) has the same amount of respondent that has diabetes in their age. Whereas only (n=3) respondent from 28-32 years old has diabetes. This means most of the respondent (n=407) does not have diabetes.

Table 5

Frequency of different age that has diabetes and non-diabetes.

Parameter		Age			Total
		15-22	23-27	28-32	
Do you have diabetes?	No	130	201	76	407
	Yes	8	8	3	19
Total		138	209	79	426

Notes: Diabetes mellitus distribution on three groups of age

History of diabetes mellitus on family background

To determine the respondents that having diabetes mellitus has a genetic inheritance factor, the respondents were asked the question in Table 4.6. Based on the family background factor, only (n=10) respondent that has diabetic come from the family that have diabetic background (n=182) and (n= 9) respondent has diabetic come from the family that does not have diabetic (n=225). The number of the two groups; respondents that having diabetic and non-diabetic and their family background is similar and not significantly difference.

Table 6

Frequency status of family background that has diabetes (yes) and non-diabetic (no).

Parameter		Does anyone else who lives with you have diabetes mellitus?		Total
		No	Yes	
Do you have diabetes?	No	225	182	407
	Yes	9	10	19
Total		234	192	426

Notes: Family background of respondents having diabetes mellitus.

Comparison between knowledge, attitude and practice between diabetic and non-diabetic respondents

The mean scores of the three domains; knowledge, attitude, and practice (KAP) were compared to determine if there is any significant difference in the means of two groups; diabetic respondents (yes) and non-diabetic respondents (no) based on Table 7. There was a significant different in the knowledge scores for diabetic respondents ($M=6.6184$, $SD=1.80902$) and non-diabetic respondents ($M=6.8674$, $SD=1.32218$); $t(18.908) = 0.593$, $p=0.045$. In attitude scores, there was not a significant different for group having DM ($M=8.2065$, $SD=1.87982$) and group not having DM ($M=7.8969$, $SD=1.43948$); $t(424) = -0.903$, $p=0.091$. There were two groups which are diabetic and non-diabetic to compared with the mean score of level of attitude. In addition, there was not a significant different in the scores for group having DM ($M=7.4759$, $SD=3.21123$) and group not having DM ($M=4.6141$, $SD=2.886441$); $t(424) = -4.234$, $p=0.308$.

Table 7

Comparison of mean $\pm$ SD, mean differences and p-value between total score of Knowledge (K), Attitude (A) and Practice (P) with status of diabetic (yes) and non-diabetic

Parameters (Total Score)	Diabetic (n=19)	Non-diabetic (n=407)	Mean Diff (95% CI)	p-value
Knowledge	6.62 $\pm$ 1.81	6.87 $\pm$ 1.32	0.25 (-0.37, 0.87)	0.045
Attitude	8.21 $\pm$ 1.88	7.90 $\pm$ 1.44	-0.31 (-0.98, 0.36)	0.091
Practice	7.48 $\pm$ 3.21	4.58 $\pm$ 2.90	-2.90 (-4.24, -1.55)	0.308

Notes: KAP level of diabetic and non-diabetic among youth. $P < 0.05$

Comparison of knowledge, attitude and practice between gender

The mean scores of KAP level were compared to identify if there is any significant different based on gender stated on Table 8. There was not a significant different in the knowledge scores for group male ($M=6.8788$, $SD=1.51845$) and female ($M=6.8470$, $SD=1.26990$); $t(424) = -0.222$, $p=0.015$. In addition, there was not a significant different for male ($m=8.0689$, $SD=1.56763$) and female ($M=7.8450$, $SD=1.41122$); $t(424) = -1.443$, $p=0.432$ in attitude scores. However, practice resulted in significant different in male ($M=4.5200$, $SD=3.07383$) and female ($M=4.8339$, $SD=2.87815$); $t(218.747) = 0.978$, $p=0.212$.

Table 8

Comparison of mean $\pm$ SD, mean differences and p-value between total score of Knowledge (K), Attitude (A) and Practice (P) between gender on diabetes mellitus among youth.

Parameters (Total Score)	Male (n=125)	Female (n=301)	Mean Diff (95% CI)	p-value
Knowledge	6.88 $\pm$ 1.52	6.85 $\pm$ 1.27	-0.03 (-0.31, 0.25)	0.015
Attitude	8.07 $\pm$ 1.57	7.85 $\pm$ 1.41	-0.22 (-0.53, 0.08)	0.432
Practice	4.52 $\pm$ 3.07	4.83 $\pm$ 2.88	0.31 (-0.30, -0.93)	0.212

Notes: KAP level between gender.

Comparison of knowledge, attitude and practice

A one-way between subject's ANOVA was conducted to compare the effect of knowledge, attitude, and practice (KAP) towards level of age among the respondents. There is a significant effect of knowledge and practice on level of age at the $p < 0.05$ level [$F(2) = 7.354$, $p=0.001$] and [$F(2) = 8.898$, $p=0.000$] respectively as shown in Table 9.

Table 9

Comparison of knowledge, attitude and practice.

	F	Sig.
Knowledge	7.354	0.001
Attitude	2.692	0.069
Practice	8.898	0.000

Notes: $P < 0.05$. KAP level among three group of age.

Comparison of knowledge, attitude and practice based on age

Further multiple comparison using Tukey's post hoc test (Table 10) indicated that the knowledge of 15-22 years old ($M = -0.52595$, $SE = 0.001$), age 23-27 ($M = 0.52595$, $SE = 0.001$) and age 28-32 ($M = 0.52812$, $SE = 0.014$) is significantly lower than those with practice; age 15-22 ($M = 1.61773$, $SE = 0.000$) and age 28-32 ($M = -1.61773$, $SE = 0.000$).

Table 10

Comparison of knowledge, attitude and practice.

Dependent Variable		(I) Age	(J) Age	Mean Difference (I-J)	Std. Error	p	95% CI
Knowledge	Tukey HSD	15-22	23-27	-0.52595*	0.14546	0.001	-0.8681 ± -.1838
			28-32	-0.52812*	0.18710	0.014	-0.9682 ± -.0881
		23-27	15-22	0.52595*	0.14546	0.001	0.1838 ± .8681
			28-32	-0.00217	0.17515	1.000	-0.4141 ± .4098
		28-32	15-22	0.52812*	0.18710	0.014	0.0881 ± .9682
			23-27	0.00217	0.17515	1.000	-0.4098 ± .4141
	Dunnett t (2-sided) ^b	15-22	28-32	-0.52812*	0.18710	0.009	-0.9381 ± -.1181
		23-27	28-32	-0.00217	0.17515	1.000	-0.3860 ± .3817
Attitude	Tukey HSD	15-22	23-27	-0.37020	0.15957	0.054	-0.7455 ± .0051
			28-32	-0.21784	0.20524	0.539	-0.7006 ± .2649
		23-27	15-22	0.37020	0.15957	0.054	-0.0051 ± .7455
			28-32	0.15236	0.19213	0.708	-0.2995 ± .6043
		28-32	15-22	0.21784	0.20524	0.539	-0.2649 ± .7006
			23-27	-0.15236	0.19213	0.708	-0.6043 ± .2995
	Dunnett t (2-sided) ^b	15-22	28-32	-0.21784	0.20524	0.433	-0.6676 ± .2319
		23-27	28-32	0.15236	0.19213	0.610	-0.2687 ± .5734
Practice	Tukey HSD	15-22	23-27	0.98258*	0.31630	0.006	0.2387 ± 1.7265
			28-32	1.61773*	0.40684	0.000	0.6609 ± 2.5746
		23-27	15-22	-0.98258*	0.31630	0.006	-1.7265 ± -.2387
			28-32	0.63515	0.38085	0.219	-0.2606 ± 1.5309
		28-32	15-22	-1.61773*	0.40684	0.000	-2.5746 ± -.6609
			23-27	-0.63515	0.38085	0.219	-1.5309 ± .2606
	Dunnett t (2-sided) ^b	15-22	28-32	1.61773*	0.40684	0.000	0.7262 ± 2.5093
		23-27	28-32	0.63515	0.38085	0.157	-0.1995 ± 1.4698

Notes: *mean difference is significant at the $p < 0.05$ level. b. Dunnett t-tests treat one group as a control and compare all other groups against it.

Correlation of knowledge, attitude and practice

The correlation coefficient between KAP is presented in Table 11. According to Cohen (2013), there are three classifications based on the level of correlation between variables: weak ($r = 0.10-0.29$), moderate ($r = 0.30-0.49$), and high ($r = 0.50-1.00$). There was high correlation of knowledge between attitude and practice ($r=1.00, p<0.01$). In addition, moderation correlation of attitude between knowledge and practice ($r=0.325, p<0.01$). However, practice resulted in weak correlation ($r=-0.013, p<0.01$).

Table 11

Pearson correlations between KAP Correlations between scores of knowledge, attitude and practices towards DM.

	Knowledge	Attitude	Practice
Knowledge	1	0.325**	-0.013
Attitude	0.325**	1	0.55
Practice	-0.13	-0.093	1.000

Notes: **Correlation is significant at the 0.01 level (2-tailed)

DISCUSSION

This study aimed to determine the KAP level among various age groups of youth. Out of the 426 respondents, only 4.5% has been diagnosed with diabetes mellitus and 95.5% is non-diabetic respondents. Most of the respondents were female because female was more likely to participate compared to male. In a previous study, female had more interest in health research compared to males (Otufowora et al., 2021). Most of the respondent have a different level of educational background, 46.0% comes from a degree student. In the previous study, the level of education was significantly associated with knowledge of diabetes mellitus (Herath et al., 2017). The majority of the population were unemployed (43%) because of the young ages who still in school or study duration, between the ages of 15-27 years old, while some of the respondents were working with different occupations as well as different educational background. Most of the respondents was single (88.5%) and only married (10.1%) due to ages of the respondents are considered young. In addition, most of the respondents does not have any children, 6.3% from the respondent has children 1-2. Majority of the respondents is from Selangor District of Petaling (Shah Alam, Subang Jaya, Petaling Jaya) (31.0%) followed by Federal Territory of Kuala Lumpur (24.4%), another 44.6% comes from other location of Klang Valley. Furthermore, this study was distribute using online platform which is easier for the respondent to answer the survey.

Furthermore, the question of "Have you ever heard about diabetes mellitus?" has been asked in the survey to identify the level of awareness among youth. Most of the respondent has heard about diabetes mellitus, whereas only little number of respondents have not heard about diabetes mellitus. This indicate that the level of awareness among youth in Klang Valley was higher. Taking an active role in health education and promotion could help increase Malaysian understanding of DM on both personal and community levels (Qamar et al., 2017). According to this research finding, only 19 of the respondents had DM, contributing to a population prevalence of DM of 4.5%. This means 407 of the respondents does not have diabetes. According to National Diabetes Registry Report (2019), the total of active diabetes patients in Malaysia registered was 897 421 in 2019 with 42.9% was male and 57.1% female. While the prevalence of diabetes among youth from aged 18-19 years old and 20-24 years old in Malaysia with 2% and 4.9% in 2011, respectively (Ministry of Health, 2015). Even majority of the respondents had a higher knowledge compared to attitude and practice. However, prevention is important in order to reduce the risk of diabetes mellitus in an individual at an early stage. This result was supported by a previous study by (Yun et al., 2007) which found that Malaysia was well known of diabetes mellitus and has a good knowledge among diabetic individual compared to healthy population. This could be due to the fact that the study participants were hospitalized and had a better access to health education (Asmelash et al., 2019). Next, family background that has diabetic and does not have diabetic only cover a little percentage to a respondent that has diabetic. With this finding, it showed DM of the youth respondents does not necessarily depend on genetic inheritance. It is supported by how slowly population gene pools evolve, the current outbreak is most likely the result of significant lifestyle changes (Dedoussis et al., 2007). In a previous study, stated that increased intake of processed meat and sugar-sweetened drinks is linked to other harmful lifestyle variables such as physical inactivity, increased BMI, smoking and bad dietary patterns, all of which have a strong link to DM (Bellaou et al., 2018).

Regarding the level of knowledge, there was a significant difference in the score of groups having DM and group not having DM. This showed that participants have a knowledge regarding DM. The score could be due to the respondent's level of education, as a considerable majority of them still in their study level in university. The majority of the responders had a basic understanding of DM, including its definition, symptoms, and more. However, in the level of attitude among two differences groups which are diabetic respondents, there was not a significant different in the scores. Same goes to level of practice among diabetic respondent and non-diabetic

respondent. According to other findings, participants with more knowledge also had a higher attitude score (Rahaman et al., 2017). This finding showed that diabetic respondent on youth has a better practice in order to maintain the sugar level, whereas non-diabetic have the knowledge of DM but they do not have a good practice to prevent DM from developing. But other finding showed majority (>75%) had moderate or good knowledge, it is not reflected on their attitudes as about 88% were found to have poor attitude towards diabetes (Herath et al., 2017). This is because of their several factors involved including ignorance (not understanding the preventive role, personal belief, work or study priorities as personal barrier for youth of non-diabetic. According to AshaRani et al. (2022), their belief on healthy does not have to attend any screening, rather than checking routine diabetes health screening. This is conception regarded as originating from Asian culture (Chien et al., 2020)

In this study, a survey is used to identify the prevalence of diabetes mellitus and to access the level of KAP among youth in Klang Valley was conducted. Based on the result, it showed that KAP among youth in Klang Valley has significance different between score of Knowledge (K) among diabetic and non-diabetic person which means there is relationship between the prevalence of diabetes mellitus and its association with KAP. While Attitude (A) and Practices (P) non-significant difference between the prevalence of DM and its association with KAP. Hence, they are already aware that diabetes mellitus was a chronic health problem, and it could be prevented. Other findings also indicate that most of their respondent is knowledgeable which means they can identify the risk of DM (Asmelash et al., 2019). Also, a study conducted in Bale, Ethiopia that their respondent recognized or understand about DM and could determine the risk factors of DM (Kassahun & Mekonen, 2017). It is possible that this is linked to the worldwide phenomena of DM which is believed become increasing each year. This becomes worst over the time.

The Ministry of Health's efforts in spreading information such as complication, prevention of diabetes mellitus or campaign regarding diabetes mellitus to increase public awareness of DM have resulted in improved attitudes and practices. Aside from that, it's possible that because respondents lived in Klang Valley received a lot of information about DM from numerous media such as brochures, radio or television, as well as social media such as Twitter, Facebook, Instagram, Telegram to help spreading the information and prevention of DM at early stage. This is due to one behavior of social modelling or action could influenced by the behavior of others (Latha et al., 2020). According to other finding, the social media post can spark an interest in someone by following their step (Kreps & Neuhauser, 2010). However, another factor such as the weight, inactivity could influence that contribute to DM which need to be taken care of. Through preventing diabetes mellitus from increasing each year, it is possible to avoid unhealthy diet, inactivity because they can help to develop DM in an individual apart from family history, race or ethnicity and more. This suggests that providing continuous health education about the DM is necessary to ensure that youth in Klang Valley have a better understanding regarding DM by gaining more knowledge as well as provide more positive attitude and practice towards DM. This is to ensure that youth could prevent this DM and could help spreading the information more towards diabetic and non-diabetic patient as well as giving them support and motivation. In this research has shown that their risk of having diabetes mellitus is lower if the respondents have a better knowledge together with a good attitude and practice of DM. If this knowledge is put into practice, it can help individuals avoid not only the disease but also a number of other chronic illnesses like cardiovascular disease as part of the complications of DM.

From the comparison analysis between three groups age include 15-22 years old, 23-27 years old and 28-32 years old, it was found that the knowledge and practice have a significance difference. Based on the comparison between knowledge and practice among youth in the study population, it was found that if the level of the knowledge and practice among community increase. However, attitude could be decreased among youth. As a result, the Ministry of Health Malaysia should raise and continue community awareness and disseminate information about DM in order to improve their understanding and as a result, their attitude and practice could be improved. Other aspects, such as motivation play a role as well. A person self-efficacy and self-regulation may be strengthened by their own values and attainable performance standards, which would result in more healthful behaviour, notable preventing DM (Chew, 2014). Furthermore, the finding revealed that knowledge between the three groups of age has a significantly lower than those with practice. This indicate that people were aware regarding the prevention of DM. This supported by the previous study that person who believe their health is result of luck or the actions of powerful other have less knowledge and are less inclined to eat healthier, while having less stress (Tam et al., 2014). Furthermore, since there is still increasing cases of DM in Malaysia. To improve youth and community member understanding on KAP about DM, the authorities should raise and disseminate awareness of the issue.

CONCLUSION

In conclusion, the current study was able to offer a thorough assessment of youth knowledge, attitude, and practices towards diabetes mellitus. According to our findings, it was proved that knowledge of three group of age among youth has significantly lower than those with practice between group 15-22 years old and age 28-32 years old. This indicate that youth were aware a good practice led to a better life. In addition, effort is very important to be taken care of to increase as well as improved the level of knowledge, attitude and practice regarding DM. Besides, there was a strong correlation found between knowledge and practice levels and attitudes. As a result,

health education needs to be improved and strengthened since it will significantly motivate youth to continue improving their knowledge and practicing proper preventative measures, and have an even more positive attitude. Limitation of this study is only for youth population in Klang Valley because it involved a small sample size. In addition, the study was conducted in Klang Valley which may limit the findings to be generalised to others setting such as involvement of adult and older people. On the other hand, ethnicity or race was not in the survey for them to answer, this indicate that the study on ethnicity and race could not be conducted. However, this finding contributes to the prevalence of DM and its association among youth in Klang Valley.

AUTHOR CONTRIBUTIONS

Nurnazira Hanis conducted the following research as part of a research project under the supervision of Dr. Nurul Azira Ismail. Nurnazira Hanis wrote this paper with the guidance of Dr. Nurul Azira Ismail and Dr. Neni Widiasmoro. All authors have read and agreed to the published version of the manuscript.

ETHICS APPROVAL

Ethical approval was obtained from the Medical Research Ethics Committee of the Management & Science University (MSU) (MSU-RMC-02/FR01/06/L1/046).

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CONFLICTS OF INTEREST

The authors declare no conflict of interest in this work.

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