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Knowledge and Attitude of Undergraduate Medical Students on the Act of Abortion and Malaysia Abortion Law: A Cross Sectional Study

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Abstract

According to World Health Organization (WHO), more than fifty million cases of abortion are performed annually. Increased mortality and morbidity rate due to unsafe abortion has become a major concern in the society. Thus, as future healthcare providers, medical students play an important role in reducing the rate of unsafe abortion. Due to the lack of attention given on abortion education in medical school, this study is aimed to assess their knowledge on abortion and its legality in Malaysia, their attitude towards abortion and their willingness to provide abortion services in their future practice. An analytical cross-sectional study was conducted among medical students of Melaka Manipal Medical College (MMMC), Malaysia from January to March 2020, with a minimum sample size of 115. Epi Info™ 7 application was used in this research to calculate the sample size. The sampling method used in this study was non-probability purposive sampling method. A self-administered questionnaire was distributed for data collection. Participation in the study is purely voluntary. Odds ratios and 95% confidence intervals were derived from ANOVA, unpaired t – test and linear regression analysis. Among 117 participants, more than two – thirds of them have low to moderate knowledge and attitude towards abortion. All respondents were willing to anticipate most of the abortion services in their future practice. Knowledge about abortion is not associated with attitude towards abortion and neither is it associated with willingness to provide abortion services in the future practices. However there is a significant association between the attitude towards abortion and the willingness to provide abortion services in upcoming practice.

Keywords

Abortion, Knowledge, Attitude, Willingness, Medical Students, Cross – Sectional Study

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1. Introduction

Abortion has become a raising concern in the 20th century. With constantly expanding population size, along with modernization, many factors contribute to the decision of having abortion. Worldwide, 25 million unsafe abortions occur every year which amounts to 45% of all abortions that happen throughout the world annually. Unsafe abortions were frequently performed by providers who lacked in the necessary skills and done in an environment that did not meet the minimum medical standards. In some circumstances, abortions were self-induced. Unsafe abortions imposed massive economic and health burdens especially on women and society. [1, 2] Abortion is among the biggest issues that is constantly being talked about and spread due to its raising issues in the society. Abortion is also prohibited in many of the developing countries in the world and also many other countries except in some restricted cases although abortion has been practiced commonly throughout the world and has been going on long before the beginning of recorded history. It is a subject that stirs up controversy. This subject has also raised some fundamental questions about humanity, human's

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existence and what makes us human. [3] In spite of this, a large number of abortion cases are being performed annually which according to WHO may reach to more than fifty million yearly. [4] Majority of the unsafe abortions that sum up to 97%, are done in developing countries such as Africa, Asia and Latin America.

On an average, four to six mothers out of 500,000 pregnancies die due to unsafe abortion practices in Malaysia. [5] There are also increased chances of spontaneous abortion in female with elder partner of at least five to ten years. [6] In Malaysia, the number of abortions, abortion ratio and the prevalence of abortion have not been officially documented even though rough estimates for local abortion ratio and abortion rate exist. Experience of women on abortion has not been studied extensively in Malaysia. Abortion is not commonly addressed as a public health issue even though it is widely available at many private clinics and some public hospitals under special conditions due to the legality as well as cultural and religion sensitivities. Most people misunderstand that abortion is illegal in all circumstances. Abortion is also not accessible easily due to the lack of information on abortion leading to unsafe abortion. [7].

In Malaysia, family planning services are unavailable towards unmarried couples. Nowadays with the trend of marrying late and sexually active adults and adolescents, issues such as unwanted pregnancies and abandonment of babies has become a concerning issue in Malaysia. [8] Abortion is a complex issue as people have different views and reasons to terminate a pregnancy. The act of abortion involves not only adults but also young girls. Generally, abortion is a punishable offence under the Penal Code of Malaysia. Unlike the other commonwealth countries such as United Kingdom, India and Singapore, there is no official and specific Act that governs abortion in Malaysia. The Penal code alone governed the act of abortion without further amendment after 1989. The issue on abortion becomes more crucial when abortion by rape victims are involved. This is based on the statistics showing that the incidence of rape cases in Malaysia is becoming more serious. However, currently there is no specific Act of the Malaysian legislative to regulate this practice. [9]

The Ministry of Health of Malaysia has defined unwanted pregnancy as “pregnancy that was not planned for or not desired by the couple or the mother at the time of conception. Sometimes this may be due to an abnormality of the foetus or of an illness in the mother”. Next, abortion is defined as “the expulsion or removal of an embryo or foetus from the uterus at a stage of pregnancy when it is incapable of independent survival (500 grams or 22 weeks gestation). It may be spontaneous miscarriage, or induced for medical or social reasons”. Termination of pregnancy instead is defined as “done for the purpose of this document is confined to procedures to remove an embryo or foetus where the pregnancy is less than 22 weeks of gestation or if the gestation is unknown, where the foetus is estimated to be less than 500 grams”. Lastly, unsafe abortion has been defined as “a procedure for terminating an unwanted pregnancy either by persons lacking the necessary skills, or in an environment lacking the minimal medical standards, or both”. [10]

In a study regarding the attitude towards abortion conducted among the Greeks, faith in God continues to be one of the significant factor of avoiding abortion. Most of the participants who took part in this study declares that faith in God makes them believe that abortion is an act of murder and a sin, whatever the reason behind the abortion. In extreme and absolute opposition towards abortion mostly come from the Roman Catholic community. [11] Besides religion, in the context of Greek law, another study also proved that Churches are against termination of pregnancy. [12] Women choose for unsafe methods of abortion because of strict laws on abortion, the high cost to terminate a pregnancy or the challenges of stigma attached to abortion. Study strongly confirmed that the most important factor of the women’s psychological reaction to abortion is the amount of support from the women’s significant other, such as partner, parents and friends. [13]

In recent years, it is known that the mechanism of stigma related to abortion has started to be focused on and understood more than before. Kumar et al. defined abortion stigma as “a negative attribute ascribed to women who seek to terminate a pregnancy that marks them, internally or externally, as inferior to the ideals of womanhood.”[14] According to this definition, women who had abortions has a hard time in the challenges of social norm that questions their sexuality and maternity causing the community to respond negatively to their decision on abortion. [15, 16] The stigma towards abortion affects the woman who had abortion and also affects the person associated within the abortion process such as the provider. [17]

A study conducted in University of Washington found that there was a strong association between those who agree to incorporate surgical abortion into practice and the intention to pursue a career in obstetric and gynaecology or women health. [18] On top of that, a survey from India recorded about 23% of the medical interns in Maharashtra agreed that the act of abortion is morally wrong but however 85% of them still believe that a women should always have the right to terminate the pregnancy in case of an unwanted pregnancy. [19] Another study demonstrated a conservative attitude among the healthcare providers in sub-Saharan Africa and Southeast Asia towards induced abortion except for the case of pregnancy due to rape or incest. [20] A study among American youth showed

that 54% of them did not know that abortion is sometimes legal under some circumstances. [21] Many doctors are reluctant to offer abortion services due to the fear of being called a murderer and the stigma of the society towards abortion. In some cases, the act of abortion is against their cultural beliefs and also religion. Low awareness and lack of knowledge of abortion law could be one of the reason why the doctors do not provide abortion services. [22]

Medical students in Malaysia do have some knowledge regarding abortion but there is still gap due to the lack of attention given on abortion education in medical school.. A study in Malaysia showed that medical students are both pro-choice and pro-life. Generally, students would agree of abortion approved under the law, to save the mother's life and to preserve her physical and mental health. However, the attitude towards other reasons of abortion varies widely and a more in-depth analysis should be done towards other factors that have a negative impact on attitude towards abortion. [22] Moreover, studies on medical students' attitudes towards abortion education in Malaysia found that about 80% of the medical students intended to provide some forms of abortion services in their future practices despite limited understanding on abortion. [23] Individuals who have spent 15 years of life in health care services are more prone to support medical termination of pregnancy. [24] In Malaysia, the medical curriculum has not taken the students opinion on what they want to learn in the university as compared to how it is done in America. There is also very little feedback taken from students about their opinion on how they have been educated on topics in these universities. [25] Pace et al. says that early exposure to clinical experiences with abortion along with family planning will impact on the knowledge, attitudes and intentions of the medical student to provide abortion in the future. This can help to abate this public health crisis. [26] The attitude and perception of the future healthcare providers' should be understood to properly orient them to the clinical practice. This is important to their future intakes. [27]

In Malaysian schools, sex education is incorporated at a very basic level. There is no proper education adolescents get on sex and reproductive health that may give rise to more and more unsafe abortions uprising in the country. The Western culture of being open minded and having sex before marriage has been something the Malaysian youth now wants to mimic, making it even more important that schools should start educating us pertaining to reproduction and contraceptive use in a more effective way. Being students means we are still apart of the youth, hence educating us the right way will spread the right message and notion to other non medical students on topics like this thus promoting a safer environment and a better future not just for the people but the country. The stigma that has been around abortion which is still a taboo for many people in the country can also be brought up in forums where the youth can have more discussions on how the problem can be battled in a healthier way. Hence we hope to get the ball rolling to help the students to think and seek knowledge on legislation on abortion, how abortion is done and how do we curb the unsafe abortion rate as we will have to face such challenges during our working life in the matter of a few years. [28]

Research question

Are Melaka Manipal Medical College (MMMC) students knowledgeable on the matter of abortion in Malaysia and what are their attitude and towards abortion in the country?

Research objective

This study is designated to find out how much do undergraduate medical students really know about abortion in Malaysia. As future doctors, it is important we have an opinion on this matter and not be swayed by the society on our perception pertaining to abortion. We have to be rationale as professionals, at the same time abide to the law regarding abortion or more commonly known as medical termination of pregnancy (MTP) that has been set in our country. We would also like to see if religion plays a role on how the students approach abortion.

Research hypothesis

Medical students in Melaka Manipal Medical College (MMMC) are aware about medical termination of pregnancy. They have a good attitude and perception towards individuals that have to take this step and are not swayed by the community around this stigma.

2. Methodology

2.1. Study Design, Setting, Time, Population

An analytical cross-sectional study entitled "Knowledge and Attitude of Undergraduate Medical Students on the Act of Abortion and Malaysia Abortion Law" was conducted among Melaka-Manipal Medical College (MMMC) students. The college offered three programs, namely Foundation in Science (FIS), Bachelor of Medicine and Bachelor of Surgery (MBBS), and Bachelor of Dental Surgery (BDS) respectively with a population of approximately 600 students. There are five semesters in MBBS, mainly semester 6 and 7 in Muar campus and 8, 9, and 10 in Melaka campus. The study was conducted among 150 medical students from clinical year in Muar campus of Melaka-Manipal Medical College (MMMC) Malaysia. The period of study was from January to March 2020, for a total of 6 weeks duration.

2.2. Sample Size

Epi Info™ 7 application was used in this research to calculate the sample size. Screenshot of the calculation is shown below.

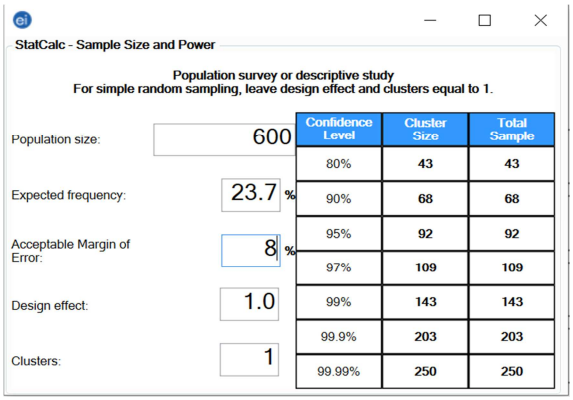

Figure 1. Sample Size.

Where,

Population size: 600 students in MMMC of Malaysia

Expected frequency: 23.7% of students with knowledge regarding the proportion of women of reproductive age who are using modern contraceptive methods in Malaysia is less than 40% [20]

Acceptable margin of error: 8.0%

Hence, based on the application Epi Info™ 7 we used the sample size 600.

For the sample size according to the confidence level 95% is 92.

Minimum sample size needed: 92

The maximum percentage of non-response rate allowed in this research is 20%.

To allow for non-response, the final sample size was calculated using the formula below:

$$n_{final} = \frac{ncalculated}{1-(non\ response\ rate)}$$

$$n_{final} = \frac{92}{1-(0.2\%)}$$

$$n_{final} = 115$$

The minimum sample size collected was 92. The final calculation was done to include the non-response rate of 20%. Hence, the final sample size calculated for this study was 115 after rounding off.

2.3. Sampling

The sampling method used in this study was non-probability purposive sampling method. Our inclusion criteria were medical students from semester 6 of Melaka Manipal Medical College Muar campus, Malaysia. The subjects are students who were present on the day of data collection, given their informed consent, and filled up all the questions in the questionnaire. Exclusion criteria in our study were students who were absent on the day of data collection, did not give their informed consent, and did not fill up the questionnaire completely.

2.4. Data Collection Methods

We have collected our data using a self-administered questionnaire which is a modified version of a validated questionnaire. The questionnaire was based on a review of past studies, and in consultation with medical professionals from the Ministry of Health and Reproductive Rights Advocacy Alliance of Malaysia and the universities that was included in the study like University Malaya (UM), University Sarawak Malaysia (UNIMAS), and Melaka Manipal Medical University (MMMC). [26]

Our questionnaire consists of 4 parts; (a) socio-demographic background, (b) knowledge of abortion, (c) attitudes towards abortion and sexuality and (d) willingness to provide abortion services in future practice.

In the first part, labelled as section A, we have asked socio-demographic questions to ask about gender, nationality, ethnicity, religion, place of upbringing, marital status and intended field of specialization. For section B, they were asked to indicate on a three point scale of ‘’yes’’, ‘’no’’, or ‘’unsure’’ about the knowledge of abortion regarding the general knowledge on abortion, safety of medical procedure on abortion, the uses of contraceptive methods in Malaysia and also the legislative on abortion whether abortion is permissible under present laws or not.

For section C: attitude towards abortion and sexuality, we used a five point Likert scale, respondents were asked to specify their strength of agreement with the statements. The statements are about the opinion of the respondent on the legalisation of abortion under exceptional circumstances, accessibility and affordability of abortion services in Malaysia, the right of the foetus to live, public education on abortion, and how religion affect the decision on abortion issue. Response options are ‘’strongly disagree’’, “disagree”, “neutral”, “agree” and ‘’strongly agree’’ of score 1, 2, 3, 4, and 5 respectively. Lastly, for Section D, the response options are “Yes”, “No” and “Unsure” of score 2, 1, and 0 respectively. The respondents were asked whether they are willing to provide contraceptive information and services to unmarried persons, also pre-abortion and post-abortion counselling. Moreover, they are asked if they are willing to guide the women in decision making for abortion or they

remain neutral and leave it to the women to decide. Last but not least, participants were asked whether they are willing to provide medical or surgical abortion in their future practices.

2.5. Data Processing and Analysis

Data collected was tabulated using Microsoft Excel and analysed using Epi Info software. The frequency and percentage were used to analyse age, gender, nationality, ethnicity, religion, place of upbringing, marital status, field of intended specialization, intended place of practice, and whether they have learnt about medical termination of pregnancy. Odds ratio was used to measure the association in our study. The level of significance is 0.05.

Table 1. Statistical Test used for Data Analysis.

Independent variable	Dependent variable	Statistical test
Age	Knowledge of abortion and abortion law	ANOVA
Gender		Unpaired t-test
Nationality	Attitudes towards Abortion and Sexuality	ANOVA
Ethnicity		ANOVA
Religion	Willingness to provide abortion services in future practice	ANOVA
Place of upbringing		ANOVA
Marital status		Unpaired t-test
Field of intended specialization		ANOVA
Intended place of practice		ANOVA
Whether they have learnt about medical termination of pregnancy		Unpaired t-test

2.6. Ethical Consideration

Research Ethics Committee, Faculty of Medicine, Melaka Manipal Medical College, Malaysia approval upon the study was received. Participation in the study is purely voluntary. Study participants were briefed upon the study objectives prior to the participation. Participants have the right to withdraw from the study without providing any reasons. They were assured that all data will remain anonymous and confidential throughout the study.

3. Results

Table 2. Socio-demographic characteristics of undergraduate medical students (n=117).

Variables	n (%)
Age	
<22	17 (14.5)
22-25	99 (84.6)
>25	1 (0.9)
Mean (SD)	22.39 (0.96)
Gender	
Male	40 (34.2)
Female	77 (65.8)
Nationality	
Malaysian	113 (96.6)
Non Malaysian	4 (3.4)
Race	
Malay	24 (20.5)
Chinese	37 (31.6)
Indian	36 (30.8)
Others	20 (17.1)
Religion	
Buddhist	29 (24.8)
Christian	18 (15.4)
Hindu	31 (26.5)
Islam	29 (14.8)
Others	9 (7.7)
Place of Upbringing	
Rural	28 (23.9)
Urban	89 (76.1)
Marital Status	
Single	116 (99.2)
Married	1 (0.9)
Field of specialization in the future	
Obstetrics-gynaecology/women's health	17 (14.5)
Paediatrics	24 (20.5)
Internal Medicine	30 (25.6)
Others	46 (39.3)
Intended place of practice	
Rural	31 (26.5)
Urban	86 (73.5)
Learnt about medical termination of pregnancy	
Yes	102 (87.2)
No	15 (12.8)

The socio-demographic characteristics of our respondents are shown in Table 2. Most of the respondents (84.6%) are from age category of 22 to 25 years old. Female respondents consist of 65.8% of the study population, with 34.2% of male students.

Out of 117 medical undergraduates that answered our research questionnaire, 4 of them are Non- Malaysian (3.4%), while the rest of 96.6% are Malaysian students. Chinese ethnicity comprised of 31.6%, followed by Indian, Malay and others with 30.8%, 20.5% and 17.1% respectively. The other race group consists of Sabah and Sarawak natives, and the students from Sri Lanka.

In terms of religion, there are 26.5% of the students whom believe in Hinduism, 24.8% of Buddhist, 15.4% of Christian, 14.8% of Muslim and a minority of 7.7% with other beliefs.

Most of the students (76.1%) were brought up in an urban setting, with the rest of 23.9% with a rural place of upbringing. The intended place of practice also of similar

figures, with 73.5% in an urban setting while the remaining 26.5% in rural area.

Besides, 25.6% of the respondents intended to pursue Internal Medicine in the future, while 20.5% and 14.5% of students want to specialise in the field of Paediatrics and Obstetrics and Gynaecology respectively. While about 39% of the students wanted to pursue other specialisation in the future, such as Surgery, Orthopaedics and Psychiatry.

Table 3. Knowledge of Abortion (n=117).

No	Statement	Correct response n, (%)
a.	Legally restricting abortion reduces the number of abortions.	42 (35.9)
b.	The vast majority of women are likely to have at least one abortion by the time they are 45 years old.	44 (37.6)
c.	Abortion is a safe medical procedure when performed with proper equipment.	98 (83.8)
d.	Abortion is a safe medical procedure when performed with correct technique.	103 (88.0)
e.	Abortion is a safe medical procedure when performed with sanitary standards.	102 (87.2)
f.	Where effective contraceptive methods are available and widely used, the total abortion rate decreases.	95 (81.2)
g.	If all contraceptive users were to use methods correctly all the time, there would not be any unintended or unwanted pregnancies.	47 (40.2)
h.	The proportion of women of reproductive age who are using modern contraceptive methods in Malaysia is less than 40%.	31 (26.5)

Table 3 depicts the correct response on the statement evaluating the knowledge of respondents regarding abortion. Majority of the medical students have a good knowledge when it comes to the safety of medical procedure on abortion when performed with correct techniques, sanitary standards, or with equipment, of 88.0%, 87.2%, and 88.3% respectively.

The knowledge on use of contraceptive methods in Malaysia to reduce on abortion rate are of 81.2%, but there are decreased to 40.2% and 26.5% of correct response when it comes to correct contraceptive method leading to unwanted pregnancies and proportion of women age using modern contraceptive methods in the country respectively.

This study shows that 35.9% and 37.6% of the medical students have knowledge of legislative on abortion whether abortion is permissible under present laws or not. This group of students are aware that abortion restriction decreases the chances of abortion rate and that most of the women have at least one abortion as they reach 45 years old.

Table 4. Knowledge about Legality of Abortion in Malaysia.

No	Conditions permissible under present laws	Correct Response n, (%)
a.	If it is performed to save the woman's life.	108 (92.3)
b.	If it is performed to preserve the woman's physical health.	100 (85.5)
c.	If it is to performed preserve the woman's mental health.	75 (64.1)
d.	If it is performed for socio-economic reasons (e.g. low family income, limited living space).	75 (64.1)
e.	If it is performed due to serious foetal impairment.	24 (20.5)
f.	If an unmarried woman became pregnant and wanted to terminate the pregnancy.	74 (63.3)
g.	If the woman's pregnancy was the result of rape	42 (39.5)
h.	If the woman became pregnant due to contraceptive failure.	80 (68.4)

Table 4 illustrated the correct response on the statement about the knowledge on legality of abortion in Malaysia, the table shows that majority of the undergraduate medical students with percentage of 92.3% and 85.5% knows that abortion is performed to save mother's life and to preserve her physical health. There is 64.1% of medical students that are aware abortion cannot be done due to socioeconomic reasons.

This survey shows that moderate amount of 68.4% medical student aware that abortion cannot be done when women can become pregnant due to contraceptive failure; also 63.3% has the knowledge that unmarried women that become pregnant and wish to terminate the pregnancy cannot undergo abortion.

More than two third of the medical students has misconception about the statement abortion cannot be performed due to serious foetal impairment with only 20.5% correct response, also only 39.5% of medical students are aware that abortion cannot be performed if the women's pregnancy was the result of rape.

Table 5. Attitude towards Abortion.

No	Statements	Strongly Disagree n, (%)	Disagree n, (%)	Neutral n, (%)	Agree n, (%)	Strongly Agree n, (%)
a.	Abortion should be legalized on demand as a woman's reproductive right to decide.	4 (3.4)	15 (12.8)	37 (31.6)	30 (25.6)	31 (26.5)
b.	Abortion services should be easily accessible.	6 (5.1)	21 (18.0)	37 (31.6)	31 (26.5)	22 (18.8)
c.	Abortion services should be easily affordable	7 (6.0)	18 (18.4)	36 (30.8)	35 (30.0)	21 (18.0)
d.	Information on abortion should be made available to the public.	1 (0.9)	7 (6.0)	25 (21.4)	54 (46.2)	30 (25.6)

No	Statements	Strongly Disagree n, (%)	Disagree n, (%)	Neutral n, (%)	Agree n, (%)	Strongly Agree n, (%)
e.	Abortion services should be made available to the public.	4 (3.4)	18 (15.4)	38 (32.5)	34 (29.0)	23 (19.7)
f.	Abortion should be carried out if the pregnancy will result in the birth of a child with physical defects.	2 (1.7)	8 (6.8)	36 (30.8)	42 (35.9)	29 (24.8)
g.	Abortion should be carried out if the pregnancy will result in the birth of a child with mental defects.	4 (3.4)	12 (10.3)	38 (32.5)	36 (30.8)	27 (23.1)
h.	A woman should have abortion if she thinks that the birth of the child will jeopardize her future.	12 (10.3)	34 (29.1)	29 (24.8)	29 (24.8)	13 (11.1)
i.	Women should be given the right to decide for themselves whether or not to carry on with the pregnancy.	6 (5.2)	8 (6.8)	35 (30.0)	41 (35.0)	27 (23.1)
j.	It is ok to abort because a foetus is not a life until it is born.	36 (30.8)	33 (28.2)	36 (30.8)	5 (4.3)	7 (6.0)
k.	A woman who is having an unwanted pregnancy should still give birth to the child because life is precious.	8 (6.8)	18 (15.4)	50 (42.7)	24 (20.5)	17 (14.5)
l.	Abortion is like taking a life as life begins at conception.	10 (8.6)	10 (8.6)	53 (45.3)	24 (20.5)	20 (17.1)
m.	Fetus has the right to live as it is a potential human being.	1 (0.9)	5 (4.3)	34 (29.1)	54 (46.2)	23 (19.7)
n.	Abortion can affect the future fertility of a woman.	1 (0.9)	11 (9.4)	29 (24.8)	55 (47.0)	21 (18.0)
o.	Abortion should be made legal for women who become pregnant as a result of rape or incest.	2 (1.7)	7 (6.0)	23 (19.7)	42 (35.9)	43 (36.8)
p.	Abortion should be made legal for economic/social reasons.	7 (6.0)	24 (20.5)	37 (31.6)	33 (28.2)	16 (13.7)
q.	Abortion providers are sinful.	28 (23.9)	26 (22.2)	57 (48.7)	4 (3.4)	2 (1.7)
r.	Women who have abortion are sinful.	35 (29.9)	24 (20.5)	54 (46.2)	3 (2.6)	1 (0.9)
s.	Having or performing abortions under any circumstances goes against my personal religious beliefs.	23 (19.7)	18 (15.4)	58 (49.6)	12 (10.3)	6 (5.1)

Table 5 illustrates the percentage distribution of respondent's level of agreement and disagreement with each statement regarding the attitude towards abortion.

Generally, more than 40% of the respondents agreed to the accessibility, affordability, and the availability of abortion services to the public. 46.2% of the students agreed that information on abortion should be made available to the public.

As shown in the table, 25.6% response agreed that abortion should be legalized on demand as a woman's reproductive right to choose, while 26.5% of the students have strongly agreed to the statement. Statement about necessity of abortion if there is detection of child with mental defects received 53.9% of agreement.

39.4% disagreement to the negative statement on abortion jeopardizing a women's future, compared with 35.9% of agreement to this statement are also noticed; with similar finding of 59% of disagreement that support that foetus is not a life, compared to only 10.3% minority who supported the statement.

More than half of the respondents, of 58.1% agreed that females have the right to continue with their pregnancies, and of 42.7% students are neutral about giving birth to the baby despite of having unwanted pregnancy since its life is precious.

Besides, 45.3% of the respondents gave a neutral response on abortion as a life taking act as life begins at conception itself.

Students agreed that fetus is a potential human being and that they have the right to live consists of 65.9% of the study population. A remarkable percentage of 72.7% agreed that it has to be legal for the abortion to be carried out if the pregnancies are due to rape or incest and with only 41.9% of the students with agreement that legality of abortion with economic and social reasons.

Statements on abortion providers are sinful, women who have abortion are sinful and that having or performing abortions under any circumstances goes against personal religious beliefs received majority of neutral response, with 48.7%, 46.2% and 49.6% respectively.

Table 6. Willingness to provide abortion services in future practice.

No	Services	Willingness, Yes n (%)
a.	Contraceptive information to unmarried persons	108 (92.3)
b.	Contraceptive services to unmarried persons.	93 (79.5)
c.	Give pre-abortion counselling.	101 (86.3)
d.	Try to persuade the client to keep the pregnancy.	66 (56.4)
e.	Remain neutral, leaving the client to make her own decision	89 (76.1)
f.	To give post-abortion counselling on future contraceptive use.	106 (90.6)
g.	To endorse or give written support to a request for an abortion provided, I am convinced that the client had been fully informed when she made her request.	78 (66.7)
h.	To make referrals for a woman who is seeking abortion services.	73 (62.4)
i.	To provide medical abortion as part of my practice.	51 (43.6)
j.	To provide surgical abortion as part of my practice.	50 (42.7)

Table 6 illustrates the willingness to provide abortion services in future practices among medical students. The result shows that the students were willing to anticipate most of the abortion services such as providing contraceptive information and services to the unmarried persons, giving pre and post-abortion counselling, giving written support to a request of abortion and making referral for a woman who is seeking for abortion in their future practice. 56.4% of the participants decided to persuade the client to keep the pregnancy while 76.1% of them decided to leave the client to make her own decision. However, there were less than half of the respondents, 43.6% and 42.7% were willing to provide medical and surgical abortion in their future practices respectively.

Table 7. Knowledge, Attitude and Willingness (n=117).

Variables	Frequency (%)
Knowledge on Abortion	
High	9 (7.7)
Moderate	69 (59.0)
Low	39 (33.3)
Mean (SD)	59.62 (19.)
Minimum- Maximum	0.00 – 100.00
Knowledge on Legal Abortion in Malaysia	
High	24 (20.5)
Moderate	48 (41.0)
Low	45 (38.5)
Mean (SD)	61.32 (21.77)
Minimum- Maximum	0.00 – 100.00
Total Knowledge	
High	15 (12.8)
Moderate	51 (43.6)
Low	51 (43.6)
Mean (SD)	9.68 (2.51)
Minimum- Maximum	18.75 – 93.75
Attitude (19-95)	
High	5 (4.3)
Moderate	83 (70.9)
Low	29 (24.8)
Mean (SD)	60.87 (11.93)
Minimum- Maximum	47.00 – 80.00
Willingness (0-20)	
Mean (SD)	15.00 (4.01)
Minimum- Maximum	0.00 – 20.00

Table 7 shows the frequency of medical students with low, moderate and high knowledge on abortion and its legality in Malaysia, attitude towards abortion and willingness to provide abortion services in their future practice. For the knowledge on abortion, majority of the students (59%) were having moderate knowledge, 33.3% with low knowledge and leaving only 7.7% with high knowledge.

However, the result on the knowledge on abortion legality in Malaysia shows a better number of students with high knowledge (24%) compared to those with high knowledge on abortion (7.7%). The frequency of students with moderate and low knowledge of the same was almost similar, which were 40% and 38.5% respectively.

In overall knowledge, majority of the students were having moderate to low knowledge, in which they shared the same percentage (43.6%) and only 12.8% were having high knowledge. For the attitudes towards abortion, only 5% of the students were having good attitude. Majority of the students (70.9%) were having moderate attitude and the rest 24.8% of the students were having poor attitude towards abortion. Lastly, overall students were willing to provide abortion services in the future practice, in which their scores range from 0.00-20.00.

Table 8. Association between Socio-demographic Characteristics, Intended Future Speciality, Intended Place of Practice and Knowledge of Medical Termination of Pregnancy, and Abortion Legality in Malaysia.

Independent Variable	Total Knowledge Percentage Mean (SD)	Mean Difference (95% CI)	P Value
Gender			
Male	57.50 (15.13)	Reference	
Female	62.01 (15.89)	4.51 (-1.52-10.55)	0.141
Nationality			
Malaysian	60.56 (15.36)	2.75 (-13.15-18.65)	0.732
Non Malaysian	57.81 (27.18)	Reference	
Race			
Malay	60.94 (17.22)		
Chinese	58.78 (12.88)		0.855
Indian	60.76 (17.53)		
Others	62.50 (16.09)		
Religion			
Buddhist	58.19 (14.48)		
Christian	60.20 (14.91)		
Hindu	58.89 (17.21)		0.448
Islam	62.07 (15.93)		
Others	68.75 (15.31)		
Place of Upbringing			
Rural	57.81 (13.35)	Reference	
Urban	61.31 (16.37)	-3.49 (-10.24 – 3.25)	0.307
Field of specialization in the future			
Obstetrics-gynaecology/women's health	65.44 (16.10)		0.159
Paediatrics	63.02 (13.90)		

Independent Variable	Total Knowledge Percentage Mean (SD)	Mean Difference (95% CI)	P Value
Internal Medicine	61.46 (14.03)		
Others	56.66 (17.05)		
Intended place of practice			
Rural	60.28 (13.26)	Reference	
Urban	60.54 (16.58)	-0.26 (-6.81 – 6.29)	0.939

Table 8 illustrates the association between gender, nationality, race, religion, place of upbringing, intended future speciality, intended place of practice with the undergraduate students' knowledge of medical termination of pregnancy (MTP) and abortion legality in Malaysia. Both male and female are at 15% when it comes to knowledge percentage with a mean percentage of 4.5. Non-Malaysians have more knowledge compared to Malaysians at 27.18% and 15.36% respectively with a mean difference of 2.75.

According to race, the Indians have 17.53% while the Malays have 17.22% showing they have the most knowledge on abortion followed by others with 16.09% and lastly the Chinese with 12.88%. Religion wise, Hindus have the highest knowledge percentage at 17.21% while Muslim and others are at 15%, followed by Buddhist and Christians with 14% of knowledge percentage. Next, most people that were brought up in an urban setting had more knowledge on abortion compared to a rural setting with percentages of 16.37% and 13.35% respectively. Even those that intend to work in an urban setting have a higher knowledge percentage compared to those that want to work in a rural setting, of 16.58% and 13.26% respectively.

Lastly, according to the intended fields of specialisation, those who intend to specialise in other fields than paediatrics, obstetrics and gynaecology and internal medicine had the highest knowledge scores at 17.05%. However all variables have P-values more than 0.05 which shows that there is no significant association between gender, nationality, race, religion, place of upbringing, intended future speciality, intended place of practice and knowledge on MTP and abortion legality in Malaysia in our study.

Table 9. Association between Socio-demographic profile, Intended Future Speciality, Intended Place of Practice, Knowledge of Medical Termination of Pregnancy and Attitudes towards Abortion.

Independent Variable	Attitude Score Mean (SD)	Mean Difference (95% CI)	P Value
Gender			
Male	61.23 (7.15)	Reference	
Female	63.05 (6.74)	1.83 (-0.83 – 4.48)	0.176
Nationality			
Malaysian	62.44 (7.02)	0.44 (-6.55 – 7.43)	0.901
Non Malaysian	62.00 (2.16)	Reference	
Race			
Malay	62.29 (8.67)		
Chinese	62.76 (7.18)		0.989
Indian	62.31 (6.66)		
Others	62.20 (4.55)		
Religion			
Buddhist	63.59 (5.60)		
Christian	59.74 (7.21)		
Hindu	62.94 (5.62)		0.423
Islam	62.34 (7.60)		
Others	62.89 (11.02)		
Place of Upbringing			
Rural	61.79 (6.79)	Reference	
Urban	62.63 (6.97)	-0.84 (-3.82 – 2.13)	0.575
Field of specialization in the future			
Obstetrics-gynaecology/women's health	62.06 (7.08)		
Paediatrics	64.50 (6.90)		0.103
Internal Medicine	63.67 (7.01)		
Others	60.67 (6.54)		
Intended place of practice			
Rural	63.06 (7.37)	0.87 (-2.01 – 3.74)	0.552
Urban	62.20 (6.77)	Reference	

Table 9 shows the association between gender, nationality, race, religion and place of upbringing, intended future speciality, intended place of practice with attitude of undergraduate students towards abortion. The males had a better attitude toward abortion compared to females with scores of 7.15% and 6.74% respectively. Their mean difference was 1.83.

Next, Malaysians were found to have a better attitude towards abortion compared to Non-Malaysians with an attitude score percentage of 7.02% and 2.16% respectively. Their mean difference was 0.44. According to races, Malays

had the highest attitude score followed by the Chinese, Indians and others at 8.67%, 7.18%, 6.66% and 4.55% accordingly. Following religion, other religions than Buddhists, Hindu, Islam and Christians had the highest attitude score at 11.02%. The attitude score of those that were brought up in the rural area and the urban area were both at 6%.

According to the field of specialization in the future, obstetrics and gynaecology had the highest attitude score at 7.08% while other fields had 6.54%. Lastly, those that intended to practice in the rural area had a higher attitude score at 7.37% compared to those who wanted to work in urban areas at 6.77%. However, all the P values are higher than 0.05 hence there is no significant relationship between gender, nationality, race, religion, and place of upbringing, intended future speciality, intended place of practice with attitude towards abortion.

Table 10. Association between Socio-demographic Status, Intended Future Speciality, Intended Place of Practice, Knowledge of Medical Termination of Pregnancy and Willingness to provide abortion in future practice.

Independent Variable	Willingness Mean (SD)	Mean Difference (95% CI)	P Value
Gender			
Male	15.08 (3.59)	-0.06 (-1.62 – 1.49)	0.937
Female	15.01 (4.23)		
Nationality			
Malaysian	14.97 (4.01)	-1.78 (-5.82 – 2.27)	0.386
Non Malaysian	16.75 (4.03)		
Race			
Malay	15.63 (4.14)	-	
Chinese	14.68 (4.58)	-	0.816
Indian	15.17 (3.73)	-	
Others	14.75 (3.35)	-	
Religion			
Buddhist	15.21 (4.35)	-	
Christian	14.05 (3.75)	-	
Hindu	14.71 (3.87)	-	0.849
Islam	15.66 (3.82)	-	
Others	15.67 (4.85)	-	
Place of Upbringing			
Rural	13.93 (4.40)	-1.45 (-3.16 – 0.25)	0.095
Urban	15.38 (3.84)		
Field of specialization in the future			
Obstetrics-gynaecology/women's health	14.88 (4.73)	-	
Paediatrics	14.54 (3.59)	-	0.735
Internal Medicine	14.73 (3.27)	-	
Others	15.54 (4.43)	-	
Intended place of practice			
Rural	14.39 (4.27)	-0.88 (-2.54 – 0.78)	0.297
Urban	15.27 (3.91)		

Table 10 shows the result findings of willingness of medical students to provide abortion services in their future practice based on the association with different aspects. In terms of gender, both male and female share almost similar mean values with males slightly higher (15.08) while females (15.01).

The mean difference (-0.06) between these two genders is the highest among all the categories. This shows that males are more willing to provide abortion services in their future practice compared to females. The study also found that non-Malaysians are more willing to provide abortion (16.75) than Malaysians (14.97) with the lowest mean difference (-1.78) between these two categories in the table findings.

There is also a strong difference between race category and religion category. This is because Malays show the highest mean value (15.63) while Chinese shows the least value (14.68) under the race category, which does not coincide with the religion category that is topped by others (15.67) and the least is shown by Christian (14.05) instead.

Those who intended to practice as a paediatrician (14.54) has the least willingness to provide abortion services compared to other specialties. Those who intended to specialize in other fields (15.54) are the most willing to provide abortion services which is even higher than those intended to pursue obstetrics and gynaecology (14.88). Based on their place of

upbringing category, medical students who are brought up in urban regions scored a higher mean value (15.38) than those who are brought up in rural region.

This finding coincides with the category of intended place of practice in the future, with those intended to practice in urban areas scored higher (15.27) than those intended to practice in rural areas (14.39). All the findings from this table however is not significant, with their P values more than 0.05. The minimum P value is (0.095) from the category of place of upbringing while the highest is from gender category (0.937).

This is further supported by the fact that the value 1 is present in the range of all 95% confidence level from all the categories in table 9. This shows that the findings are not significant.

Table 11. Association between Knowledge, Attitude and Willingness.

Variable	r	P-value
Knowledge vs Attitude	0.1	0.250
Knowledge vs Willingness	0.1	0.278
Attitude vs Willingness	0.3	<0.001

Table 11 demonstrates the findings of how knowledge, attitude and willingness are associated with abortion. The P value of attitude vs willingness is less than 0.001, which is less than 0.05. Therefore, the result shows a significant value with association between attitude towards abortion and willingness to provide abortion in their future practices. The other two associations show no significant value as both are less than 0.05 with knowledge vs attitude (0.250) while knowledge vs willingness (0.278). Therefore, knowledge about abortion is not associated with attitude towards abortion and knowledge about abortion is not associated with willingness to provide abortion in future practices. On the other hand, all 3 associations showed a positive correlation with magnitude of r value in attitude versus willingness (0.3) and showed the same value in both comparisons of knowledge versus attitude (0.1) as well as knowledge versus willingness (0.1).

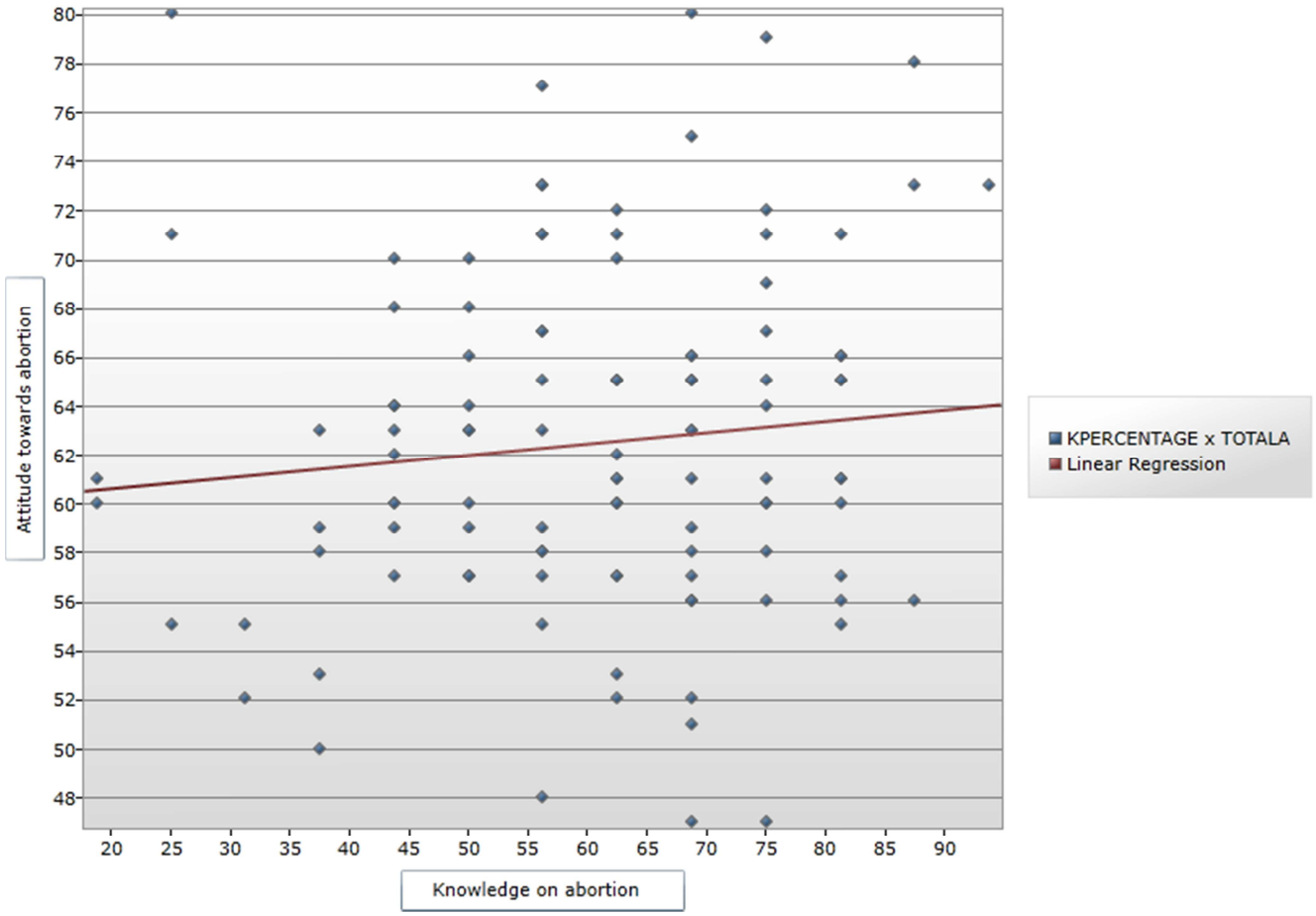

Figure 2. Association between Knowledge on Abortion and its Legality and Attitude towards Abortion.

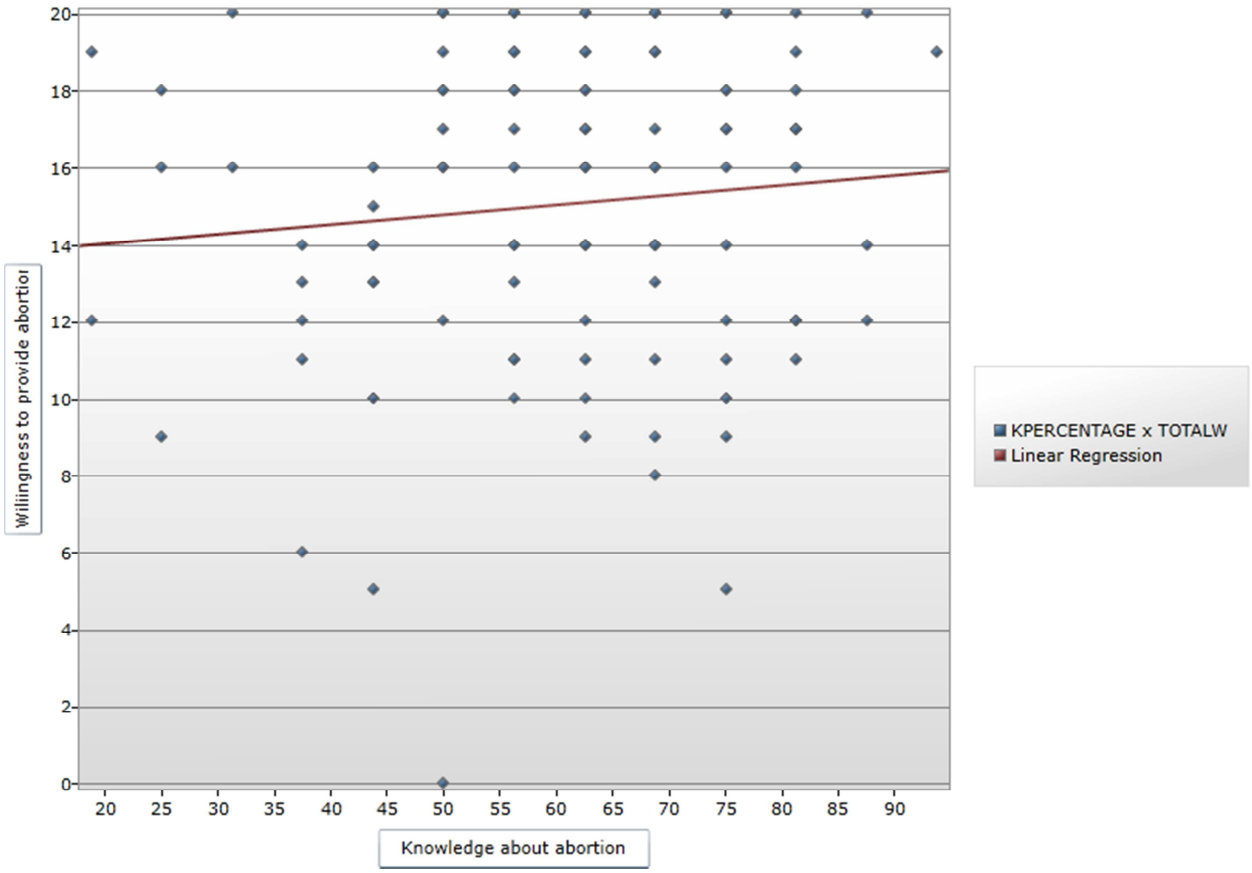

Figure 3. Association between Knowledge on Abortion and its Legality and Willingness to Provide Abortion Services.

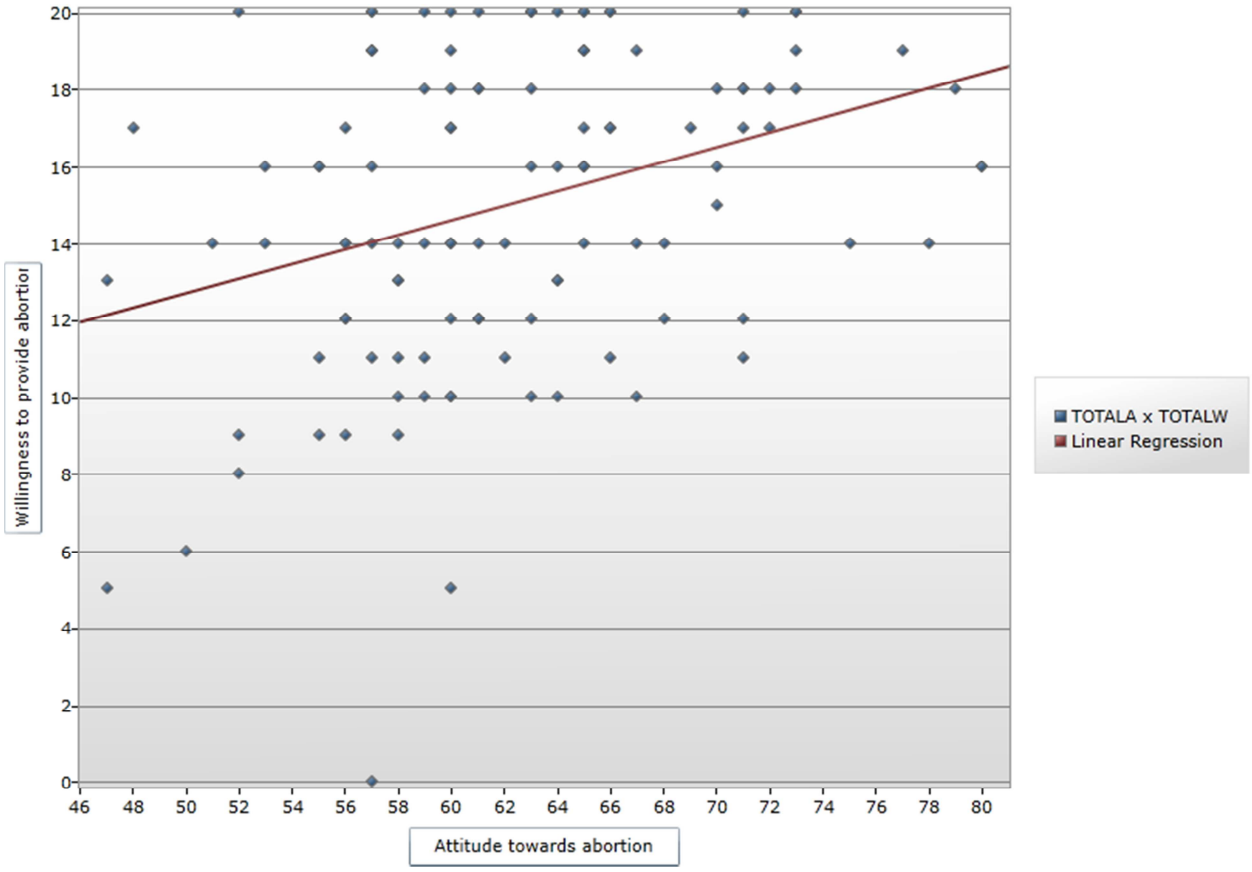

Figure 4. Association between Attitude towards Abortion and Willingness to Provide Abortion Services.

4. Discussion

We conducted a cross-sectional study among medical students of Melaka Manipal Medical College (MMMC) to assess their knowledge on abortion and its legality in Malaysia, their attitudes towards abortion and their willingness to provide abortion services in future practice. Based on our results, we found out that about half of the students were having moderate to low knowledge on abortion. There was only one in eight of the students who possess high knowledge. Most of the students were deficient in abortion knowledge compared to the knowledge on the abortion legality in Malaysia. About one – third of the respondents were less aware that by making the abortion legal can reduce the number of abortion, as reflected in our data analysis. Two quarters of our participants were having a misperception in which they thought that majority of women at the age of 45 are likely to have at least one abortion and that correct contraceptive measures can provide 100% protection. Besides, data analysis result showed that only small proportion of the students knew that abortion can be performed if there is serious foetal impairment (20.5%) and if the woman's pregnancy was the result of rape (39.5%). Moving on to gender wise, our results showed that females had a better knowledge compared to the males. Next, we also found out that those who were brought up in an urban area had a higher knowledge compared to those in rural areas. Moreover, those who prefer obstetrics-gynaecology or women's health as their future specialization has a higher knowledge compared to the other fields of specialization. A previous cross-sectional study from Malaysia conducted among the medical doctors also showed that majority of the doctors especially the house officers had a misconception as they believed that a correct contraceptive method can completely prevent the unwanted pregnancy. This is concurrent to our study findings. [29] Another study on knowledge about abortion law among Mexican youth showed that more than half of the respondents were unaware about the legality of abortion in their state by which they believed that abortion was never legal. They also found out that their awareness had a significant association with their level of education and the type of school they had attended. [9] Knowledge is an important pivotal element to give a clue for someone to proceed to a particular action. This was proven by a study conducted among the women and health care providers in Malaysia, in which they found out that the lack of knowledge in the abortion law among women results in their difficulties in accessing abortion information and services hence decided to go for an illegal abortion. [17]

In our study, the attitude towards abortion was mostly on the neutral side especially in the statement of abortion providers were sinful, the women who undergo abortion were sinful and that having or performing abortions under any circumstances were against personal religion beliefs received majority of neutral response, with 48.7%, 46.2% and 49.6% respectively. This showed that religion do not have a significant impact on the attitude of medical students towards abortion. They were also neutral on the statement giving birth to the baby despite of having unwanted pregnancy since life is precious and abortion as a life taking act as life begins at conception itself. Most of the respondents were both pro-life and pro-choice. Only 10.3% of the medical students strongly disagree on the negative statement of a woman should have abortion if she thinks that the birth of the child will jeopardize her future. This was a pro-choice statement as they gave the right to the women to do abortion if she thinks the birth of the child will bring a negative impact to her. In the previous study, it was found that the medical students were also both pro-life and pro-choice., the students would agree on the statement that were allowed by the law, for example to save the life of the mother and to preserve her physical or mental health. However, their attitude on abortion for other reasons than that vary widely based on different sub-groups. There was need for this to be studied especially on the perception of normative beliefs among the peers and society which would cause negative impact on attitudes towards abortion. [22] A cross-country study in Norway and Northern Ireland showed there was significant difference in students' attitude to abortion reflecting differences in religious, legal and educational experiences. [32]

The result of more than 50% of students were willing to provide advice and prescribe contraception to unmarried people were shown in our study. They were also willing to provide counselling to the patient before and after an abortion. Next, they were willing to leave the choice of abortion on the mother but also willing to persuade the mother to keep her pregnancy. Moving on, many students were willing to give a written letter to endorse abortion or a referral of patient seeking abortion services. However less than 45% of the students were willing to provide medical or surgical abortion services as part of their practice. In our study, males were more willing to provide abortion services in their future practice compared to females. The study also found that non-Malaysians were more willing to provide abortion services. Those who intended to practice as paediatricians have the least percentage of willingness to provide abortion services compared to other specialties. Now looking at previous studies, we found that family planning services in Malaysia does not provide information regarding the use of contraception to an unmarried person [22] which shows that it is great many students are willing to provide this service to them. According to a study done in University

of Washington, medical students were least enthusiastic about supporting non – physician provision of abortion. This was believed to be due to perceiving the procedure to be outside of their training scope as well as to protect their own clinical territory. [18] There was another study carried out in Canada that had the same results that showed medical students who perceived that obtaining abortion training would be difficult had significantly weaker intentions to pursue training in and to provide abortion services in future practice. They believed that it would be hard to hire people who are willing to provide abortion services. [24] This shows how medical students are less willing when it comes to providing abortion services medically or surgically but it could be due to other reasons that we did not get the time to explore in our study due to time restrictions. Christian and Muslim respondents were more to believe that abortion was morally unacceptable for any reason and say that they would never perform the procedure or refer patients for an abortion compared to other religions. [14] This finding also coincided with our study which shows religion may play a part in medical student to make a decision on abortion.

Based on our data analysis, knowledge about abortion was not associated with attitude towards abortion neither was it associated with willingness to provide abortion services in the future practices. This somehow contradicted with the previous study showing that less knowledge on abortion law was one of the reasons that abortion services are not provided. [22] However, there was a significant association between the attitude towards abortion and the willingness to provide either medical or surgical abortion as their part of service in the future. This finding corroborate the previous study conducted on medical students' attitudes towards Malaysian education regarding abortion, stated that despite of limited knowledge on abortion, majority of the medical students intended to provide service of abortion in the future. [23]

A positive correlation was shown in all aspects comparisons, namely attitude towards abortion versus willingness to provide abortion in the future with the highest absolute value of r, knowledge on abortion versus attitude towards abortion, as well as knowledge of the same versus willingness to provide abortion services in the future. Although the magnitude shows low correlation, it signifies a new finding since previous studies did not apply this degree of association.

Throughout the study, we encountered some of the limitations stated below. Our sample only included one semester of the students since the other semester were on sessional and final exams. Hence, our sample was not able to generalise to the large population and the number of the population were of small number. Therefore this study should not be generalized among other medical students in different settings and in different colleges. Besides, the study design selected, namely Cross – Sectional Analytical Study, was not able to reflect the causal relationship between all the variables. There were no observational changes over time as well. We also did not ask about the perception of the respondents in our research. To overcome the above restriction, the parameters shall include the involvement of all medical students in the college, giving priority to the final year students as they are of the nearest duration to practice. This will indirectly increase the population size.

Interventions to increase abortion knowledge should focus on multiple exposures to ensure accurate knowledge, especially of complex concepts such as the legal gestational age limit. [30] Respondents also can be trained in abortion regarding general knowledge, legal aspect, pre- and post-abortion counselling. Besides, abortion procedures and education can also be included in the existing medical curriculum. [22] This will help in the declination of the maternal morbidity and mortality rates when safe abortion services are made available. Recommendations on supporting opposition to legislative restrictions that hinder abortion and increase the difficulty of providing and training in abortion can also be considered, including funding limitations for abortion education and training. [31]

5. Conclusion

To conclude, despite the lack of knowledge on the act of abortion and on the abortion law in Malaysia and poor attitude towards abortion among medical students, they are still willing to provide abortion services in their future practices. In regard to this, interventions need to be done to enhance the level of understanding and perception of medical students regarding abortion provision. Academic medical institutions have to make sure that the students have a good understanding of the laws and their responsibility to conduct professional action in terms of abotion care. Moreover, the institution should also provide abortion training to help the students to become more competent and confident to provide the service. Upcoming research can consider other sampling methods, such as stratified random sampling, which gives each student in the institution an equal probability to be included in the study. This allows the data to be collected from random student samples from different semesters of study especially those in the final year as they are entering their clinical practices. The need to recruit more participants is crucial to reduce bias and to gain more information regarding medical student's view on abortion so that it can be studied extensively and can be applied or generalised to the population. Moreover, online surveys can be considered as it would help in recruiting more participants and would be more convenient and time efficient compared to paper based questionnaires.

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