THE EFFECTIVENESS OF TUBERCULOSIS (TB) EDUCATION INTERVENTION PROGRAMME ON KNOWLEDGE, ATTITUDE, PRACTICE AND STIGMA ABOUT TB AMONG SECONDARY SCHOOL STUDENTS IN KELANTAN.

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TABLE OF CONTENTS

ABSTRAK

KEBERKESANAN PROGRAM INTERVENSI PENDIDIKAN TUBERKULOSIS (TB) TERHADAP PENGETAHUAN, SIKAP, AMALAN DAN STIGMA MENGENAI TB DI KALANGAN PELAJAR SEKOLAH MENENGAH DI KELANTAN.

Pendahuluan Tuberkulosis (TB) adalah masalah kesihatan yang utama di kalangan berjuta-juta orang setiap tahun di seluruh dunia. Di Malaysia, walaupun terdapat program kawalan TB yang komprehensif, jumlah kes TB masih membimbangkan, termasuk kes di kalangan remaja. Kira-kira 8.5% daripada kes TB di Malaysia terdiri daripada kanak-kanak dan remaja yang berumur 10 hingga 19 tahun. Senario semasa menunjukkan bahawa strategi yang inovatif perlu dilaksanakan untuk kawalan TB yang berkesan. Program pendidikan kesihatan di sekolah adalah penting kerana TB boleh tersebar secara meluas dalam suasana sekolah dan ini memujudkan cabaran untuk kawalan penyakit TB. Program pendidikan kesihatan yang dilaksanakan di sekolah dapat menyampaikan maklumat yang tepat mengenai TB dan menghasilkan tingkah laku sihat agar dapat membantu mengawal dan mengakhiri TB.

Objektif Untuk menentukan keberkesanan program pendidikan TB mengenai pengetahuan, sikap, amalan dan stigma di kalangan pelajar sekolah menengah di Kelantan.

Kaedah Kajian ini adalah kajian intervensi (bukan rawak) di sekolah yang dijalankan di kalangan pelajar sekolah menengah dari dua daerah di Kelantan. Kumpulan intervensi menerima program pendidikan TB yang terdiri daripada ceramah, kuiz, perbincangan kumpulan kecil, poster dan bahan bercetak mengenai TB manakala kumpulan kawalan menerima pendidikan kesihatan mengenai penjagaan kesihatan remaja. Pelajar dipilih dengan menggunakan persampelan secara kluster. Pengetahuan,

sikap, amalan dan stigma skor mereka dinilai sebelum, dan satu bulan selepas program menggunakan satu set soal selidik yang telah disahkan. Langkah-langkah berulang ANOVA telah digunakan.

Keputusan Sejumlah 236 pelajar sekolah menengah terlibat di dalam kajian ini. Majoriti responden adalah berbangsa Melayu dan terdiri daripada perempuan. Purata skor peratusan (SD) untuk pengetahuan asas, sikap, amalan dan skor stigma bagi responden adalah 54.0 (4.48), 65.6 (1.74), 70.0 (1.43) dan 66.0 (6.88). Terdapat perbezaan yang signifikan (p <0.001) dalam pengetahuan, dan stigma untuk kumpulan intervensi berbanding kumpulan kawalan, diselaraskan untuk gender, kumpulan etnik dan status merokok, 4 minggu selepas program pendidikan TB. Walau bagaimanapun, untuk sikap dan amalan, tidak terdapat perbezaan yang signifikan (p = 0.210 dan p = 0.243, masing-masing) dalam kumpulan intervensi berbanding kumpulan kawalan berdasarkan masa.

Kesimpulan Kajian ini menunjukkan bahawa tahap asas pengetahuan dan amalan pencegahan tentang TB adalah setara di kalangan pelajar sekolah menengah. Keseluruhannya, mereka mempunyai sikap positif terhadap penyakit TB. Walau bagaimanapun, stigma negatif terhadap TB adalah tinggi. Program pendidikan kesihatan yang digunakan dalam kajian ini terbukti berkesan dalam meningkatkan pengetahuan dan mengurangkan stigma terhadap TB di kalangan pelajar sekolah menengah. Program pendidikan kesihatan ini boleh dijadikan sebagai salah satu strategi untuk pencegahan dan pengawalan TB di Malaysia terutamanya di kawasan sekolah.

Kata kunci: Tuberkulosis; Remaja; Pengetahuan; Sikap; Amalan; Stigma

ABSTRACT

THE EFFECTIVENESS OF TUBERCULOSIS (TB) EDUCATION INTERVENTION PROGRAMME ON KNOWLEDGE, ATTITUDE, PRACTICE AND STIGMA ABOUT TB AMONG SECONDARY SCHOOL STUDENTS IN KELANTAN.

Introduction Tuberculosis (TB) is a major health problem affecting millions of people every year worldwide. In Malaysia, despite having a comprehensive TB control program, the number of TB cases is still alarming, including cases among adolescents. About 8.5% of TB cases in Malaysia were children and adolescent with highest TB incidence between age group of 10 to 19. The current scenario indicates that innovative interventions among adolescents have to be taken seriously for its effective disease control. The need for school intervention programme is crucial as TB can extensively spread in congregate settings like school environment, thus it creates challenges for TB control. Health education programme could streamline accurate information and facilitate health-seeking behaviours among adolescents towards TB, which will help in control and end the TB.

Objective To determine the effectiveness of TB education programme on knowledge, attitude, practice and stigma among secondary school student in Kelantan.

Methodology This study was a school-based interventional study (non-randomized trial) conducted among secondary school students from two districts in Kelantan. The students were selected by using cluster sampling among second form (14-year-olds) and fourth form (16-year-olds) students. The intervention group received TB education program consisted of a lecture, quiz, small group discussion, posters exhibition and printed materials on TB while the control group received information on adolescent health and hygiene. Their knowledge, attitude, practice, and stigma score were assessed

before and one month after the program using validated structured questionnaire. Repeated measures ANOVA were applied.

Results A total of 236 secondary school students were involved with majority of them were Malay and female predominant. The mean percentage score (SD) for baseline knowledge, attitude, practice and stigma score for the respondents were 54.0 (4.48), 65.6 (1.74), 70.0 (1.43) and 66.0 (6.88) respectively. There was a significant difference ($p < 0.001$) in the knowledge and stigma score for intervention group compared to control group, adjusted for gender, ethnicity and smoking status 4 weeks post TB educational programme. However, with regards to attitude and practice score, there was no significant difference ($p = 0.210$ and $p = 0.243$, respectively) comparing both groups.

Conclusion The baseline adolescents in the present study were found to have average levels of knowledge and preventive practices with regards to TB. Overall, they had positive attitudes toward TB disease; however, the level of negative stigma against TB was high. This TB education intervention progamme has been shown to be effective in improving the knowledge and stigma regarding TB among secondary school students. This health education program can be used as one of the strategies for the prevention and control of TB in Malaysia, especially in schools.

Keywords: Tuberculosis; adolescents; knowledge; attitude; practice; stigma

CHAPTER 1: INTRODUCTION

1.1 INTRODUCTION

1.1 Introduction

The ancient scourge of tuberculosis (TB) still remains a major global health problem as it still causes ill-health in millions of people each year and in 2016, TB was one of the top 10 causes of death from an infectious disease worldwide (World Health Organization, 2018). *Mycobacterium tuberculosis*, the bacteria that causes TB was carried in airborne particles and can easily transmitted through coughing, spitting, speaking or sneezing (Centers for Disease Control and Prevention; Ministry of Health, 2012). TB is highly contagious and the ease of infection made anyone in all age groups can contract the disease including children and adolescent. Persons who have compromised immune systems such as having HIV, malnutrition or diabetes, or people who use tobacco and living in overcrowded condition, have a much higher risk of getting TB. When a person has active TB disease, he or she may has typical symptoms such as cough, fever, night sweats, or weight loss and fatigue. However these symptoms could be in mild form which can delay the presentation (Ministry of Health, 2012)

This bacteria has been around for centuries and with a timely diagnosis and correct treatment, most people who develop TB disease can be cured. However, even though we had equipped with drugs to treat TB effectively, we still unable to eradicate this deadly infection fully as lacked of awareness about TB and high TB stigma among public lead to delays in seeking care and results in transmission of bacteria to others (Andrew Courtwright and Abigail Norris Turner, 2010; Khairiah Salwa, Nur Hairani, Noresah, & Wan Asna, 2012; Koay, 2004; Rundi, 2010)

The WHO declared TB a global emergency in 1993, and the Stop TB Partnership proposed a global plan that aimed to save 14 million lives between 2006 and 2015. In

2016, the WHO's Stop TB Strategy was replaced by the End TB Strategy, which covers a 20-year period (2016–2035). The End TB Strategy aims to end the global TB epidemic. With 2015 as the baseline, the strategy includes the targets of a 90% reduction in TB deaths and an 80% reduction in the TB incidence by 2030 (World Health Organization, 2014). Recognising the health concerns of TB, Ministry of Health (MOH), Malaysia has embarked on several measures to control the disease such launching the National TB control programme (NTP) since 1961. This program covers prevention strategies i.e vaccination, screening and detection especially in high risk group, treatment by implementing the DOTS treatment strategy and produced guideline for managing TB effectively (Ministry of Health, 2016).

Despite having a comprehensive TB control programme, Malaysia has a high number of cases. In 2017, the World Health Organization (WHO) reported the estimated TB rate in Malaysia as 93 in 100,000. Thus, Malaysia was categorised as an intermediate TB-burden country (World Health Organization, 2017). A national study found that children and adolescents accounted for 8.5% of the TB cases (Liew et al., 2015). A survey conducted in Kelantan obtained similar results: 8.4% of the registered TB cases in 2012–2015 were children and adolescents (Hafizuddin, Nik Rosmawati, & Hasniza, 2019). In addition, Malaysia's treatment success rate for TB remains below 90% (World Health Organization, 2013).

Studies conducted in Malaysia have found a low awareness and knowledge of TB (Khairiah Salwa, et al., 2012; Koay, 2004; Rundi, 2010). Not only was the knowledge about the disease low, but the level of social stigma was reported as high (Khairiah Salwa, et al., 2012; Rundi, 2010). Stigma remains a significant challenge for TB control programs across the prevention-to-care continuum (Chowdhury, Rahman, Mondal, Sayem, & Billah, 2015; Andrew Courtwright and Abigail Norris Turner, 2010) It can

prevent people from getting tested, using care services or changing their behaviour to avoid the spread of the disease (Dodor and Kelly, 2009; Jittimanee et al., 2009). In Malaysia, the level of TB awareness among public has been low even though there were many health promotions on TB done by the government using brochures, books, internet, social media and posters in health facilities. However, addressing TB was not the current priority as TB is no longer number one killer disease in Malaysia. There was lack of community interactive intervention programme focusing issue on TB. The priority for health promotion was given to outbreaks of dengue fever, H1N1 influenza, severe acute respiratory syndrome (SARS), bird flu and hand, foot and mouth disease (Nur Hairani and Khairiah Salwa, 2015).

Current scenario indicates that tuberculosis is not a medical or even public health problem alone but as a social problem where innovative interventions have to be taken seriously for its effective control. The sustainability of the NTP with continuous commitments and coordinated effort nationwide are pertinent to control the disease in the future. Community participation and high public awareness are crucial to reduce delays in diagnosis and treatment initiation as well as to support patients' adherence to treatment, in effect, to build resilience against the disease. It is essential to involve every segment of the community including school children for effective prevention and control of tuberculosis.

Given the health concerns related to TB, interventions must be well planned in order to be effective. Because social factors play an essential role in TB management, secondary school children were the target audience. Intervention targeting school children was crucial for TB control and towards TB elimination because the risk of TB transmission is high in congregate settings like school, thus making investigating exposures and treating infected contacts become more challenging (Centers for Disease

Control and Prevention, 2013). Apart from that, these adolescents are accustomed to receiving classroom instruction, they were expected to be more receptive and responsive to specific health messages, and to more easily comprehend the information and relay it to other household members. This was demonstrated in a systematic review of preventive health education in 11 studies, the researchers concluded that health education in schools could have a positive effect on knowledge, attitudes and preventive behaviours (Bieri, Gray, Raso, Li, & McManus, 2012).

The United States Centers for Disease Control and Prevention's (CDC) Healthy Youth initiative and the WHO reports have stressed the important role of schools in influencing the health education of future generations (Centers for Disease Control and Prevention, 2016; World Health Organization, 1997). The acquisition of health-related knowledge, skills and attitudes can empower children to live healthy lives and to become change agents in their communities. Not only does the provision of health education to children have a short-term effect; it can lay the foundation for their healthy development during adolescence and the rest of their lives. Therefore, a programme that increases TB awareness among secondary school children could have a significant effect on prevention. In this study, the health belief model (HBM) was applied to a TB education programme that aimed mainly to increase knowledge, to promote positive attitudes, to encourage preventive behaviours and to reduce stigma. One of the first models applied to TB research (Janz and Becker, 1984), the HBM is frequently used in health education, health promotion and disease prevention (Jadgal, Nakhaei-Moghadam, Alizadeh-Seiouki, Zareban, & Sharifi-Rad, 2015). This study aimed to evaluate effectiveness of TB education programme by assessing knowledge, attitudes, practices and stigma (KAPS) among secondary school children.

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CHAPTER 2: OBJECTIVES OF THE STUDY

2.1 GENERAL OBJECTIVES

To study the level of knowledge, attitudes, practices and stigma regarding TB among secondary school children in Kelantan and to determine the effectiveness of TB education programme among them.

2.2 SPECIFIC OBJECTIVES

1. To determine a baseline level of knowledge, attitudes and practices among secondary school students in Kelantan.

2. To determine effectiveness of TB education programme by assessing levels of knowledge, attitude, practice and stigma on TB between intervention and control group among secondary school students.

CHAPTER 3: MANUSCRIPT

TITLE PAGE

Response of Adolescents to Tuberculosis Education Programme in Kelantan, Malaysia

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ABSTRACT

Tuberculosis (TB) is contagious and the transmission risk is high in congregate settings like school. Incidence of TB is still alarming in Malaysia including among adolescents. A TB education program was developed to improve knowledge, attitude, practice and stigma (KAPS) among adolescents in Kelantan. This school-based, non-randomized controlled study was conducted among secondary school students aged 14 and 16 years with a total of 236 respondents. The KAPS score were assessed before and one month after the programme using self-administered validated KAPS questionnaire on TB. The data were analysed using repeated measures ANOVA. There was improvement in all domains except attitude in the intervention group. However, the score for practice was not statistically significant. For adolescents, this programme was effective in improving knowledge and stigma related to TB. Addressing adolescents TB is crucial to halt TB epidemic. This programme could be an intervention strategy for TB control in Malaysia.

Keywords: Tuberculosis; adolescents; knowledge; attitude; practice; stigma

INTRODUCTION

Tuberculosis (TB) continues to be a global health problem that affects millions of people each year. Despite having a comprehensive TB control programme, Malaysia has a high number of cases. In 2017, the World Health Organization (WHO) reported the estimated TB rate in Malaysia as 93 in 100,000. Thus, Malaysia was categorised as an intermediate TB-burden country (World Health Organization, 2017). Malaysia has implemented high quality TB management in combating TB since 1961, yet our treatment success rate for TB remains below 90% (World Health Organization, 2013).

A national study found that children and adolescents accounted for 8.5% of the TB cases with high TB incidence was reported between age group of 10 to 19 years old (Liew, et al., 2015). A survey conducted in Kelantan obtained similar results: 8.4% of the registered TB cases in 2012–2015 were children and adolescents, where the mean age for TB infection was 15.98 years (Hafizuddin, et al., 2019). Current scenario indicates that effective TB control strategies involving adolescents should be established to control TB transmission and aim to end the TB. In the present study, the respondents were secondary school students aged 14 and 16 years. Thus, it represents the age group of Malaysian adolescents who are at risk for TB.

Studies conducted in Malaysia have found a low awareness and knowledge of TB (Khairiah Salwa, et al., 2012; Koay, 2004; Rundi, 2010). Not only was the knowledge about the disease low, but the level of social stigma was reported high (Khairiah Salwa, et al., 2012; Rundi, 2010). Stigma remains a significant challenge for TB control programs across the prevention-to-care continuum (Chowdhury, et al., 2015; Andrew Courtwright and Abigail Norris Turner, 2010) It can prevent people from getting tested,

using care services or changing their behaviour to avoid the spread of the disease (Dodor and Kelly, 2009; Jittimanee, et al., 2009). In Malaysia, the level of TB awareness among public was low, even though there were many health promotions on TB done by the government using brochures, books, internet, social media and posters in health facilities. However, addressing TB was not the current priority as TB is no longer number one killer disease in Malaysia. There was lack of community interactive intervention programme focusing issue on TB. The priority for health promotion was given to outbreaks of dengue fever, H1N1 influenza, severe acute respiratory syndrome (SARS), bird flu and hand, foot and mouth disease (Nur Hairani and Khairiah Salwa, 2015).

The WHO declared TB a global emergency in 1993, and the Stop TB Partnership proposed a global plan that aimed to save 14 million lives between 2006 and 2015. In 2016, the WHO's Stop TB Strategy was replaced by the End TB Strategy, which covers a 20-year period (2016–2035). The End TB Strategy aims to end the global TB epidemic. With 2015 as the baseline, the strategy includes the targets of a 90% reduction in TB deaths and an 80% reduction in the TB incidence by 2030 (World Health Organization, 2014). Recognising the health concerns of TB, Ministry of Health (MOH), Malaysia has embarked on several measures to control the disease such as launching the National TB control programme (NTP). This program covers prevention strategies i.e vaccination, screening and detection especially in high risk group, treatment by implementing the DOTS treatment strategy and produced guideline for managing TB effectively (Ministry of Health, 2016).

Given the health concerns related to TB, interventions must be well planned in order to be effective. Because social factors play an essential role in TB management, secondary school children were the target audience. Intervention targeting school children was crucial for TB control and towards TB elimination because the risk of TB

transmission is high in congregate settings like school, thus making investigating exposures and treating infected contacts become more challenging (Centers for Disease Control and Prevention, 2013). Besides, these adolescents are accustomed to receiving classroom instruction, they were expected to be more receptive and responsive to specific health messages, and to more easily comprehend the information and relay it to other household members. This was demonstrated in a systematic review of preventive health education in 11 studies, the researchers concluded that health education in schools could have a positive effect on knowledge, attitudes and preventive behaviours (Bieri, et al., 2012).

The United States Centers for Disease Control and Prevention's (CDC) Healthy Youth initiative and the WHO reports have stressed the important role of schools in influencing the health education of future generations (Centers for Disease Control and Prevention, 2016; World Health Organization, 1997). The acquisition of health-related knowledge, skills and attitudes can empower children to live healthy lives and to become change agents in their communities. Not only does the provision of health education to children have a short-term effect; it can lay the foundation for their healthy development during adolescence and the rest of their lives. Therefore, a programme that increases TB awareness among secondary school children could have a significant effect on prevention and disease control. In this study, the health belief model (HBM) was applied to a TB education programme that aimed mainly to increase knowledge, to promote positive attitudes, to encourage preventive behaviours and to reduce stigma as shown in Figure 1. One of the first models applied to TB research (Janz and Becker, 1984), the HBM is frequently used in health education, health promotion and disease prevention (Jadgal, et al., 2015). This study aimed to evaluate adolescents' knowledge, attitudes, practices and perceptions of stigma (KAPS) after a TB education programme.

MATERIAL AND METHODS

A school-based interventional study was conducted in two secondary school involving, Pasir Mas and Pasir Puteh districts, in Kelantan between July and November 2017. The participants were literate students in the second form (14-year-olds) and fourth form (16-year-olds). Those who are illiterate and could not understand Malay language were excluded.

The sample size was calculated through the comparison of two means between and within the groups with requirement for power 0.80 and assuming a type I error rate of 5%. From this calculation, the four outcome variables i.e. knowledge, attitude, practice, and stigma of this study were obtained. Standard deviation of mean difference of stigma within the group was 5.28 (Nik Rosmawati and Mohd Zahirudin, 2015) and estimated difference of 1.5, giving the stigma domain yielded the largest sample size (n = 98) and was therefore adopted for the study. An additional 20% was chosen to compensate for dropouts; thus, there were 118 respondents in each group. Thus, the total sample size was 236.

A cluster sampling was implemented to select participants which involved first selecting one school from two districts and allocated the schools to intervention and control groups (non-randomized). The participating students from the Pasir Mas district were assigned to the intervention group, and those from the Pasir Puteh district were assigned to the control group. The schools were chosen based on their profiles, which included the distance to the nearest city, academic performance and numbers of students. In addition, the distance between these two schools, approximately 60 km, avoided contamination effects. Then, two forms were selected at each level of education which were second form (14-year-olds) and fourth form (16-year-olds). All form four students

were included whereas, two classes from form two were selected as suggested by the teachers. The parental consent and youth assent forms were distributed several days earlier to the students with a brief explanation about the study by the investigator. All students from each selected classroom were invited by teachers to voluntarily participate and those who consented were included in study. Open label was applied as it was not possible to blind the respondents, school administrative staff and investigators. The recruitment of the respondents started once the approval letter from Human Ethics Committee of USM, the Ministry of Health and the subsequent permission letter from the Kelantan State Department of Education had been received. The students were chosen subsequent to the receipt of the approval letter from their school principal.

The data was collected through a validated unpublished Malay-language version of the TB knowledge, attitude, practice and stigma (KAPS) questionnaire (Rosnani, Nik Rosmawati, & Mohd Zahirudin, 2017). The set of questionnaire were constructed, validated and pretested on 200 secondary school students during the phase I of the study as part of research grant. The questionnaire consisted of five sections: (1) socio-demography (2) knowledge (3) attitude (4) preventive practice and (5) stigma towards TB. The item for knowledge, attitude and practice domains were constructed from a survey done in 2015 towards TB among secondary school students (Nik Rosmawati and Mohd Zahirudin, 2015). For the item in stigma domain, it was translated into Malay language from the TB- and HIV/AIDS-related stigma scales by Van Rie et al. (Van Rie et al., 2008). The Cronbach's alpha values for the KAPS domains were 0.621, 0.590, 0.629 and 0.862, respectively.

The first section of the questionnaire had 6 socio-demographic questions relating to age, gender, ethnicity, smoking status, vaping status, and usage of substance abuse. The second section concerned knowledge of TB. It contained three subdomains that

covered the general understanding of TB (11 items), the symptoms (9 items) and prevention (5 items). Each item was answered with '1' for the correct answer and '0' for the wrong answer or to indicate uncertainty. The maximum score for knowledge was 25. The higher the score, the greater was the students' knowledge about TB.

The third section measured attitudes to TB and people with the disease (5 items). The items consisted of behaviour and cognitive response towards prevention of TB. The attitude was assessed with a 5-point Likert scale: '1', strongly disagree; '2', disagree; '3', unsure; '4', agree; and '5', strongly agree. The maximum score was 25. The higher the score, the better was the respondents' attitude towards TB and those with the disease.

The next section measured preventive practices towards TB (6 items), such as cough etiquette. For each item, the frequency of a practice was indicated by a '2' if it was done almost all the time, '1' if occasionally and '0' if never. The maximum score for the practice section was 12. Thus, the higher the score, the higher was the frequency of the prevention practice.

The last section dealt with stigma toward TB patients (11 items). Stigma was assessed with a 5-point Likert scale: '1', strongly disagree; '2', disagree; '3', unsure; '4', agree; and '5', strongly agree. The maximum score was 55. The higher the score, the greater was the stigma towards TB. All of the scores were reversed for negative statements.

The education intervention in this study implemented an interactive concept using extracted and modified content from TB related products from the Health Promotion Unit, Malaysian Association for the Prevention of Tuberculosis (MAPTB) Kelantan, guideline on TB by Ministry of Health guideline on TB, CDC websites, and from the literature reviews (Khairiah Salwa, et al., 2012; Nik Rosmawati and Mohd Zahirudin, 2015; Rundi,

2010). The intervention was delivered via a 30-minute lecture, quizzes, small-group discussions, a poster exhibition and four booklets. The content validation for lecture, quiz and cases for small-group discussion were done by a group of experts: a respiratory physician, a family medicine specialist and a public health specialist. The TB education intervention programme was conducted by trained health educators (the authors) and delivered once with duration of 4 hours.

The lecture was given by the Public Health lecturer in the Malay language for 30 minutes. It consists of 45 slides presentation, and the content focus on TB epidemiology, mode of TB transmission, symptoms of TB, those who are at risk of TB, TB treatment and prevention strategies. Our utmost intention by giving this lecture was that respondents will be aware the severity and susceptibilty of the disease and benefit of seeking early treatment for TB. Apart from that, we also promote quit smoking as part of preventive habit in reducing risk of getting TB. The lecture ended with questions and answer session.

A quiz regarding TB was an interactive session and used as a tool to assess respondents' understanding about TB. The quiz consisted of 14 questions and covered almost similar topic as TB lecturer. The duration of quiz session was 30 minutes. Rewards was given to students who participated in answering the questions. A brief explanation and discussion on each answer done to strengthen the information.

Another interactive session was small group discussion consist of one doctor handling a group of student (15-20 students each group). There were two case scenarios created for discussions (cultural-based) and to address mainly on positive attitude, preventive practice and stigma regarding TB. Duration for this session was 60 minutes. Those doctors who handled the group session had been brief and given the cases to discuss by researcher team one day before the program.

Along with the program, there was six huge posters size 24 x 56 inches used as tools for TB exhibition. All posters were provided by the Malaysian Association for the Prevention of Tuberculosis (MAPTB) Kelantan. The posters consisted of world and Malaysia epidemiology for TB, mode of TB transmission, symptoms of TB, those who are at risk of TB, TB treatment and prevention strategies. The posters were in the Malay language. Other than posters, chest radiograph also shown to the students comparing the healthy lungs and lungs infected by TB.

For sustainability of this program, four informative printed booklets (TB symptoms, HIV coinfection, TB contact and TB treatment) were distributed to all respondents for their reading during free time. All materials were in Malay language and were provided by Jabatan Perubatan Masyarakat Universiti Sains Malaysia and MAPTB Kelantan.

The control group was presented with information on adolescent health and hygiene. The intervention evaluation was conducted twice for each group: at baseline and 4 weeks post-intervention. Evaluation for immediate post intervention was not done as planned in previous protocol because after discussion it was deemed unnecessary since it was too soon to see some changes and it did not reflect proper short term changes. The participant requirements and intervention programmes are presented in Figure 2 and Appendix B.

The data were analysed with IBM SPSS Statistics for Windows, Version 24.0 software. Descriptive statistics were used for all the variables. Pearson's chi-squared test and Fisher's exact test were performed to compare the baseline characteristics of the control and intervention groups. A repeated measures analysis of variance (ANOVA) was used to compare the mean scores within and between the groups. The dependent variables

were the KAPS scores with two levels of measurement: at baseline and 4 weeks following the TB education programme. Gender, ethnicity, and smoking status were a potential confounder. The level of significance was set at 0.05 with two-tailed fashion.

RESULTS

A total of 236 secondary school students, 118 in the control group and 118 in the intervention group, comprised the sample. The response rate was 100% in both groups. A majority of the students were Malay. Females predominated. Of the 236 students, 8% indicated that they smoked, 20.3% vaped, and a small number, 0.8%, abused substances. There were no significant differences in age, vaping status or substance use and abuse between the groups. However, for gender, ethnicity and smoking status, there were statistically significant differences (Table 1).

Baseline Knowledge, Attitude, Practice and Stigma score

The mean (*SD*) pre-intervention knowledge score for the respondents (n = 236) was 13.5 (4.48) out of a maximum of 25. The mean (*SD*) total attitude score was 16.4 (1.74) out of a possible maximum of 25, and the mean (*SD*) total practice score was 8.4 (1.43) out of a possible maximum of 16. The mean (*SD*) total stigma score was 36.3 (6.88) out of a possible maximum of 55.

There was no significant difference between the groups for baseline knowledge (p = 0.277), practice (p = 0.650), or stigma (p = 0.086). However, there was a significant difference in the baseline attitude score of the groups (p = 0.009).

Intervention effects

Table 2 presents the results for the comparison between KAPS scores for the groups at baseline and 4 weeks after the intervention. A repeated measures ANOVA revealed a significant difference ($p < 0.001$) in the knowledge (Figure 3) and stigma (Figure 6) scores for the control and intervention groups, adjusted for gender, ethnicity, and smoking status at 4 weeks after the TB education programme. The attitude (Figure 4) and practice (Figure 5) score for the control and intervention groups, adjusted for gender, ethnicity and smoking status, 4 weeks after the education programme revealed that there was no significant difference *(p*-values of 0.218 and 0.243, respectively).

The comparison of the mean KAPS scores on the basis of time and simultaneous group differences (Table 3) revealed a significant improvement in the mean score in all the domains except attitude in the intervention group. In the control group, there was no significant difference in the KAPS score at baseline and 4 weeks after the TB education programme.

DISCUSSION

This study assessed adolescents' responses to a TB education programme that presented strategies for increasing knowledge, improving attitudes, promoting preventive practices and reducing stigma. The adolescents in the present study were found to have average levels of knowledge and preventive practices with regards to TB. Overall, they had positive attitudes toward prevention; however, the level of stigma towards the disease was high. This high level of stigma could pose an obstacle to treatment and contact tracing in this group. A few studies have reported that low public awareness had led to an increase in the number of TB cases. Lack of knowledge regarding TB symptoms and disease transmission resulted in delay seeking for treatment and increased TB contact.

A qualitative study involving 32 people of Sabah had reported almost all respondents (96%) did not know the aetiology of TB, and 81% of them were unaware of TB symptoms and disease spread (Rundi, 2010). In 2012, a study of 400 students at University Sains Malaysia found that a majority (90.5%) had heard about TB; however, their knowledge about the disease and its causative factors was limited. 60% of the respondents indicated that TB can spread through contaminated food or drink, 33.3% agreed that TB disease caused by genetic and 22% agreed that it can transmitted through sexual contact (Khairiah Salwa, et al., 2012). A descriptive cross-sectional study, which was conducted in Kudat, Sabah also found poor general knowledge of TB symptoms and transmission (Koay, 2004). The study also reported that the respondents perceived that negative social attitudes existed towards TB. A study in Thailand explored social stigma to TB and knowledge related to TB and HIV among patients with both diseases. Of the 769 patients enrolled, 65% reported high TB stigma, 23% low TB knowledge, and 49% low HIV knowledge (Jittimanee, et al., 2009).

In the present study, the participants in the TB education programme exhibited a significant increase in knowledge. This confirms the results of an intervention study conducted in Alexandria which reported, in a health education programme consisting of 90 minute lecture-discussion session followed by 30 minutes questions & answers and aided by slides and posters provided to 467 secondary school students in 12 schools, the knowledge about modes of transmission, TB symptoms and preventive practice of TB improved significantly (Shatat, Deghedi, Shama, Koura, & Loutfy, 2005). Another cross-sectional study was conducted at a Philippines high school with a total population of 1,906 students. A 20-minute lecture about TB was presented to the students. The high school students' knowledge of TB, which was 65.22% at baseline, increased to 86.83% after a health education intervention (Panaligan and Guiang, 2012). These findings were similar to those of an intervention study conducted in India. The knowledge levels were significantly improved after a 30-minute audio-visual health education session (Gopichandran, Roy, Sitaram, Karthick, & John, 2010). Health education intervention as simple as lecture was proven to improve the knowledge and awareness regarding TB among adolescents. It can be delivered via many approach and methods. In the present intervention programme, the understanding of TB was increased even four weeks post intervention via a 30-minute lecture that included a multimedia presentation, interactive quiz session, and poster exhibition. The students also received pamphlets containing information about the disease.

Besides leading to an increase in knowledge, the present intervention programme resulted in a statistically significant improvement in the stigma scores. In addition to the audio-visual session, quiz and printed materials were presented, and small-group interactive discussions with a doctor were held. Two case scenarios were created with a focus on stigma, attitude and preventive practices. The interactive session

presented a situation to correct the negative perceptions of TB. Few studies have evaluated the effects of health education interventions on TB stigma. A systematic review of the literature on TB stigma indicated that only a few studies have suggested that TB education programmes aimed at health care professionals, individuals with TB and those at risk might reduce stigma. The data on the effectiveness of these strategies are scarce (Andrew Courtwright and Abigail Norris Turner, 2010). A focus group study found that individuals enrolled in TB clubs perceived themselves to be less affected by stigma than those receiving standard clinical treatment (Demissie, Getahun, & Lindtjorn, 2003). The clubs provided an environment in which the members'TB status was highly visible and accepted. In contrast, a quasi-experimental study reported that stigmatising attitudes in the general community in Nigeria had increased after an intervention involving trained community volunteers to develop awareness about TB (Balogun et al., 2015). A reason for the increment of misconceptions could be because of the community volunteers only received 2-day training and not fully understood the cause, transmission, signs, and cure of TB. These findings recommended the need for multiple training sessions with the trainer in future programmes and interventions. In the present study, our intervention activities were handled by trained health care provider, and the respondents' negative stigma were reduced by giving TB scientific education. Thus by having accurate and adequate knowledge, it was able to reduce the stigma regarding TB.

There was no significant change in attitudes and practices over the course of the present educational intervention study. Several studies showed level of knowledge and awareness was not associated with attitudes and practices. A cross-sectional study involving 250 primary health care centers in Iraq was conducted among 500 patients and 500 health care workers, found that almost half of the patients had unfavourable attitudes and practices towards TB while 64.4% had good levels of knowledge. Similarly, there

was discrepancy between the knowledge of the health care workers and their practice. Good knowledge level regarding TB was not reflected in the practices, especially regarding investigating suspect TB cases (Hashim, Al Kubaisy, & Al Dulayme, 2003). In a multi-center community cross sectional study conducted in Saudi Arabia population found that most of the respondents had general awareness but not adequate knowledge regarding TB. Majority of them also had negative attitudes toward TB and people with TB. The negative attitude reported as majority thought they will not suffer from TB, feel fears toward TB and less than half would search for treatment. 42.3% of the respondents would avoid people with TB and 29.9% fear with them (Aseeri et al., 2017). In an interventional study done in Iran regarding the effectiveness of health education programmes focused on knowledge, attitudes and preventive behaviours towards TB, suggested that interventions should focus on the culture and beliefs of a population in order to improve and to maintain positive attitudes. The intervention programme can be led by a trained group or individual consultations concerning their learning and hometown educators with similar beliefs (Mohammadi, Tavafian, Ghofranipoor, & Amin-Shokravi, 2012). The present intervention programme included culturally-competent interactive discussion presented through case scenarios that focused on Malay's perspectives, attitudes and preventive practices towards. A majority of our respondents were Malay (94.5%) since the study was conducted in Kelantan, which is located in the northeast of Peninsular Malaysia where the majority of the population is Malay (95.9%) (Department of Statistics, 2018). However, the session was held by the doctors who might had different beliefs with the local Kelantanese. This element could be the reason for the lack of change in these domains. According to a study related to health behaviour among Malaysian adolescents found that culture had a great influence on desirable health behaviours among adolescents (Siti Rabaah, Turiman, Maimunah, & Zulaiha, 2019). Culture can affect

behaviours through values, beliefs and traditional roles. Healthy behaviour includes good practices related to health and disease prevention.

Another reason might be the limited period as the study was conducted towards the end of school term which allowed for only one intervention and evaluation. A study done in Ethiopia was conducted to assess the effectiveness of "TB clubs" among TB patients. They found that this intervention improved societal attitudes towards TB patients and increased patient confidence. A weekly meeting to support treatment adherence and to facilitate information sharing had a positive effect on attitudes (Demissie, et al., 2003). Repetition and support are essential for promoting positive attitudes and maintaining preventive health behaviours over the long term. Health education is essential for adolescents to gain knowledge, to maintain good health, to adopt healthful practices, to eliminate the risk factors for infectious disease transmission and to improve their quality of life. High information levels are one of the crucial requirements for developing positive attitudes, reducing stigma and promoting preventive behaviours regarding TB; thus, there is a need for educational interventions. Phased interactive educational interventions, digital technologies, including social media, should be used and appropriate for adolescents. Since this health education intervention effectively increases the knowledge of the students, it might be used as a comprehensive and structured guideline to the teachers to deliver the message to the students. Continuous health education programme should be given to ensure that their in-depth knowledge about the TB and its transmission which could be interpreted into their future lifetime's attitude and preventive practices.

The present study also found an 8% prevalence of cigarette smoking and a 20.3% prevalence of vaping. However, the number of cigarette smokers was comparatively lower than that (11.7%) reported in a 2016 survey of Malaysian adolescents (Institute for Public Health, 2016). Similar survey also reported that 9.1% of Malaysian adolescents

and 7.8% of adolescents in Kelantan State were current e-cigarette user. (Institute for Public Health, 2016). A retrospective cross-sectional study of children and adolescents in Kelantan found that cigarette smokers were three times more likely than non-smokers to develop TB infection (Hafizuddin, et al., 2018). A case-control study of older children in Brazil also found a relationship between cigarette smoking and TB infection (Stevens, Ximenes, Dantas, & Rodrigues, 2014). Tobacco cigarettes and e-cigarette can lead to an addiction problem as both products contained nicotine. The main reasons for the high prevalence of e-cigarette smoker among adolescents were peer-influence, using it as an aid for smoking cessation, perceived as a safer option and relatively cost-effective than tobacco cigarettes (Nurul Azreen, Faridah, Nur Suhaila, & Rosediani, 2019). In our education intervention programme, we able to address this issue and promote quit smoking to the secondary school students during the lecture and small group discussion.

Different methods of health education programme for adolescents have been carried out worldwide and each of the methods had its own limitation and strength, so did in the current health education package. The majority of the study participants were Malays; hence it may not represent the population of Malaysia with multiple ethnic groups. Evaluation for this present study was using a set of questionnaire which could lead to bias and inaccurate response. Furthermore, the follow-up period was rather a short period which was only four weeks after the intervention. We were unable to conclude the effectiveness of the education on the KAPS longer than the present duration.

Regardless of the limitations, this did not markedly change the results of the present intervention, which could be due to the appropriate sample size. On the other hand, potential confounders (gender, ethnicity and smoking status) has been controlled when analysing to strengthen our study outcomes. The findings of this study can be attributed to the use of the national language for the intervention programme, thus

provided better respondents' perceptiveness.

As the analysis and findings in this study had demonstrated, knowledge alone did not influence adolescent's attitude and practice. Their belief and culture also had great influence on their health behaviours. Involvement of teachers or their hometown educators with similar belief in giving health education, have a stake in improving and maintain positive attitude. However, the individuals need to have multiple training before conducting the intervention with the adolescents. This health education package could be used as a comprehensive guideline for teachers to deliver the message to the students.

CONCLUSION

The role of health education is significant for the dissemination of accurate information and the modification of attitudes and lifestyles. Disease awareness will facilitate the development of personal health-seeking behaviours and improve perspectives on TB. The secondary school health education intervention programme in this study was effective for increasing knowledge and reducing stigma but not improving attitudes and practices. This TB education intervention could be used as culturally-competent intervention and could assist teachers or community in delivering continuous health education to the adolescents about TB. Intervention for school children was crucial for TB control as the risk of transmission is high in congregate settings like school.

AUTHOR'S CONTRIBUTION

RNZ and NRH presented the idea and reviewed the research proposal with NAI. NAI designed the study, conducted research, provided research materials, collected and organized data with supervision from RNZ and NRH. NAI analyzed, interpreted data and wrote the initial article supervised by RNZ and NRH. WMZ help and supported in data analyzing and report. RNZ NRH RDM and AI wrote the final draft of the article. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

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TABLES AND FIGURES

Table 1. Respondents' sociodemographic characteristics (n = 236)

Characteristics	Control (n = 118)	Intervention (n = 118)	*p*-value[€]
	n (%)	n (%)	
Age group			
14	40 (33.9)	30 (25.4)	0.154
16	78 (66.1)	88 (74.6)	
Gender			
Male	40 (33.9)	58 (49.2)	0.017
Female	78 (66.1)	60 (50.8)	
Ethnicity			
Malay	107 (90.7)	116 (98.3)	0.019*
Non-Malay	11 (9.3)	2 (1.7)	
Smoking status			
Yes	5 (4.2)	14 (11.9)	0.031
No	113 (95.8)	104 (88.1)	
Vaping status			
Yes	11 (9.3)	13 (11.0)	0.667
No	107 (90.7)	105 (89.0)	
Use of substance abuse			
Yes	1 (0.8)	0 (0.0)	0.316
No	117 (99.2)	118 (100.0)	

[€]Chi-square test
*Fisher's Exact test
Level of significance was set at 0.05

Table 2. Mean difference of KAP and Stigma on TB between groups analysis, time-based comparison by using repeated measures ANOVA

Domain	Mean[a] (SD)		Adjusted mean[b] (95% CI)		F stats (df)	*p*-value[c]
	Intervention	Control	Intervention	Control		
Knowledge						
Baseline	13.8 (4.73)	13.3 (4.22)	13.9 (13.03, 14.68)	13.2 (12.38, 14.03)	195.0	<0.001
4-week	21.4 (3.80)	13.2 (3.96)	21.4 (20.71, 22.12)	13.1 (12.51, 13.92)	(1, 231)	
Attitude						
Baseline	16.8 (1.76)	16.1 (1.68)	16.7 (16.42, 17.05)	16.1 (15.81, 16.44)	1.5	0.218
4-week	16.7 (1.71)	16.4 (2.06)	16.7 (16.35, 17.05)	16.4 (16.10, 16.80)	(1, 231)	
Practice						
Baseline	8.4 (1.41)	8.4 (1.46)	8.5 (8.19, 8.72)	8.4 (8.10, 8.63)	1.4	0.243
4-week	8.9 (1.61)	8.5 (1.68)	8.9 (8.57, 9.18)	8.5 (8.24, 8.85)	(1, 231)	
Stigma						
Baseline	35.6 (7.14)	37.1 (6.54)	35.5 (34.27, 36.81)	37.2 (35.87, 38.41)	12.7	<0.001
4-week	32.3 (9.52)	37.2 (6.47)	32.1 (30.62, 33.55)	37.4 (35.90, 38.84)	(1, 231)	

[a]Descriptive mean; [b]based on Estimated marginal mean
SD = Standard deviation; CI = Confidence interval
[c]Group-time interaction of repeated measure analysis of variance. Adjusted for gender = 1.58, ethnicity = 1.06 and smoking status = 1.92.

Table 3. Comparison of mean KAPS regarding TB within each group based on time by using repeated measures ANOVA

Comparison	Control		Intervention	
	Mean diff (95% CI)	*p*-value€	Mean diff (95% CI)	*p*-value€
Knowledge				
At 4-week - baseline	-0.01 (-0.75, 0.73)	0.976	7.56 (6.82, 8.30)	<0.001
Attitude				
At 4-week - baseline	0.32 (-0.08, 0.72)	0.111	-0.04 (-0.43, 0.36)	0.861
Practice				
At 4-week - baseline	0.18 (-0.10, 0.46)	0.212	0.42 (0.14, 0.71)	0.004
Stigma				
At 4-week - baseline	0.24 (-1.18, 1.65)	0.745	-3.46 (-4.87, -2.04)	<0.001

€Repeated measures ANOVA

The mean difference is significant at the 0.05 level.

Adjustment for multiple comparisons: Bonferroni.

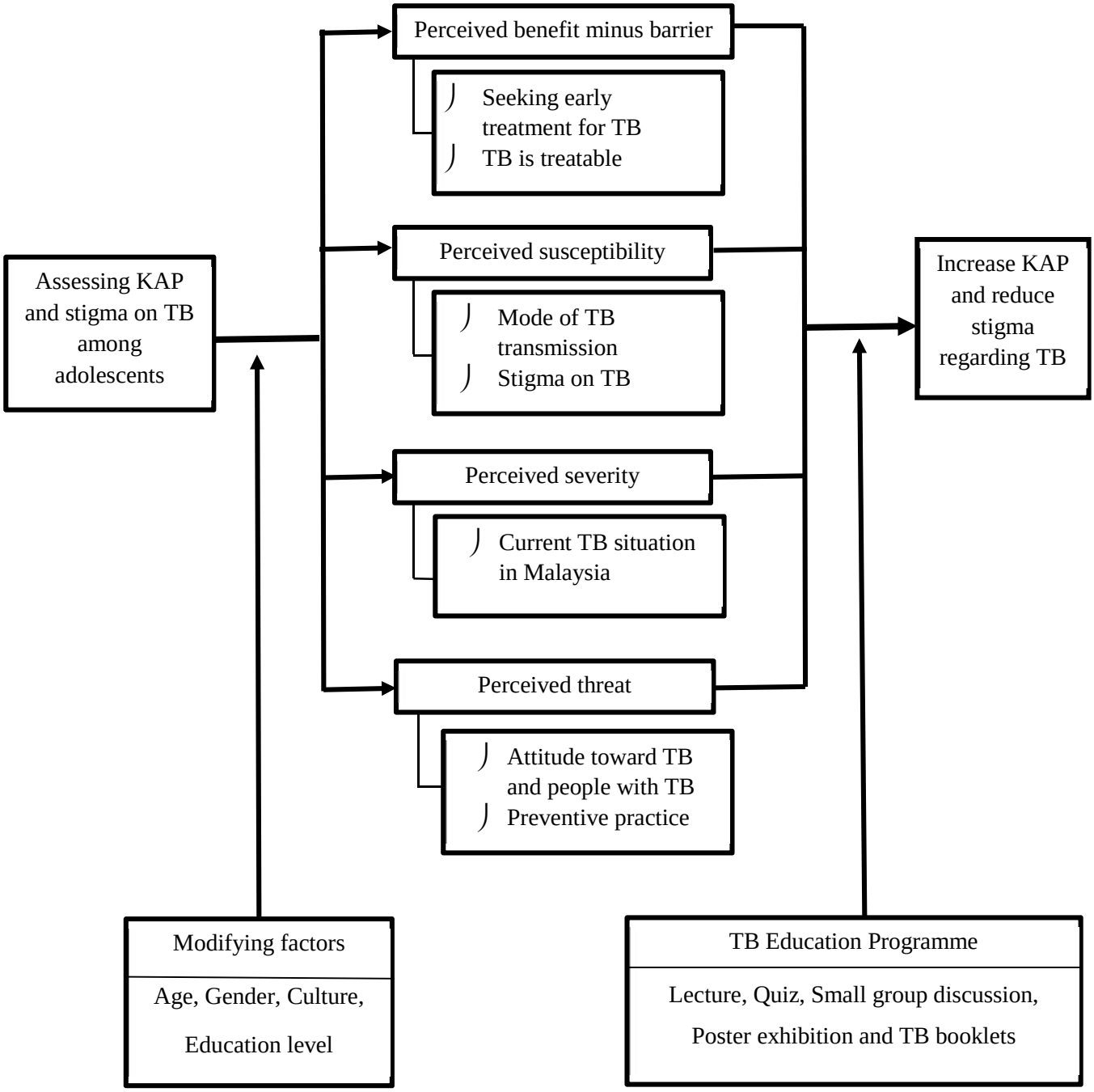

Figure 1. Conceptual framework

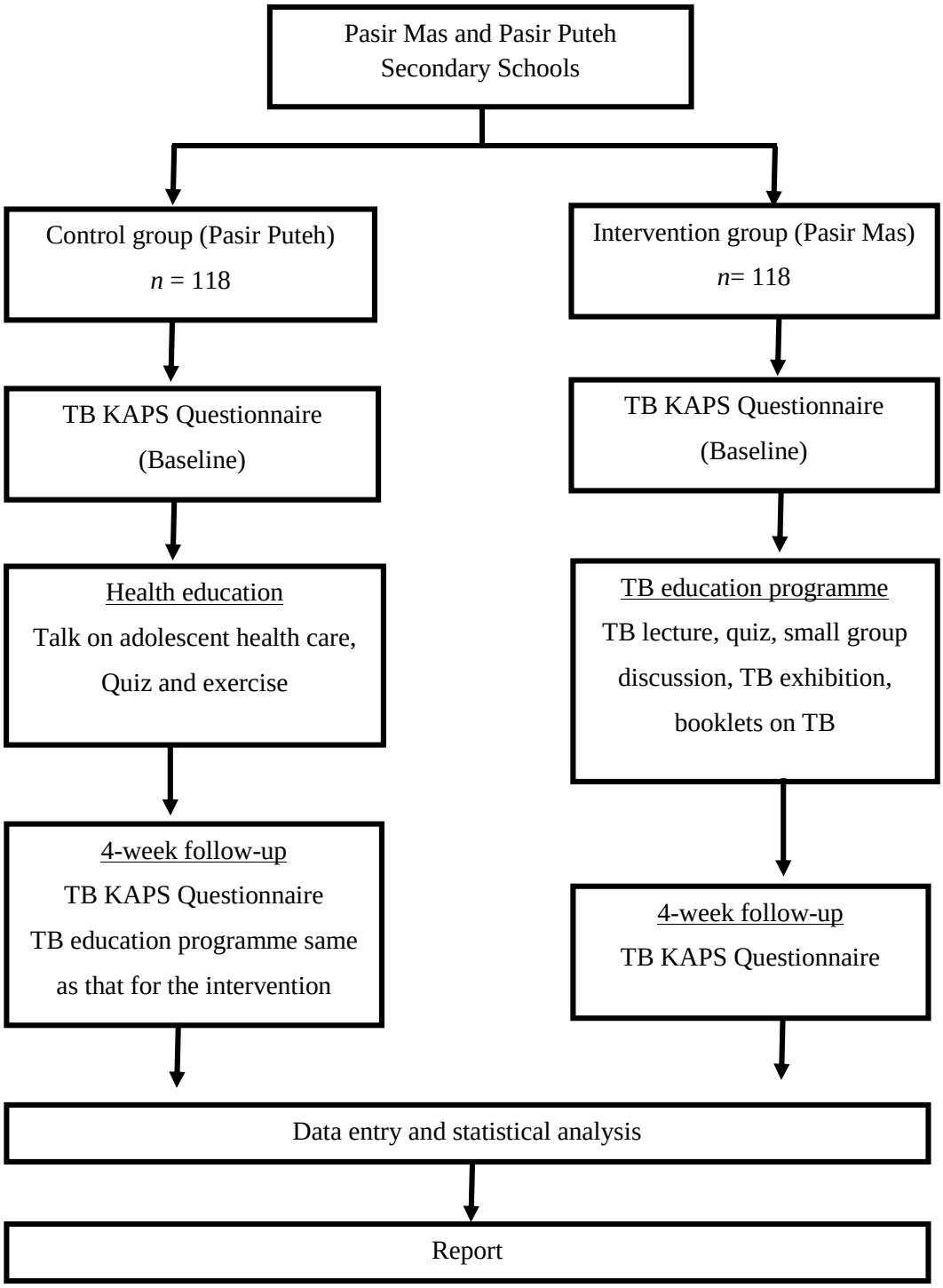

Figure 2. Study flow chart

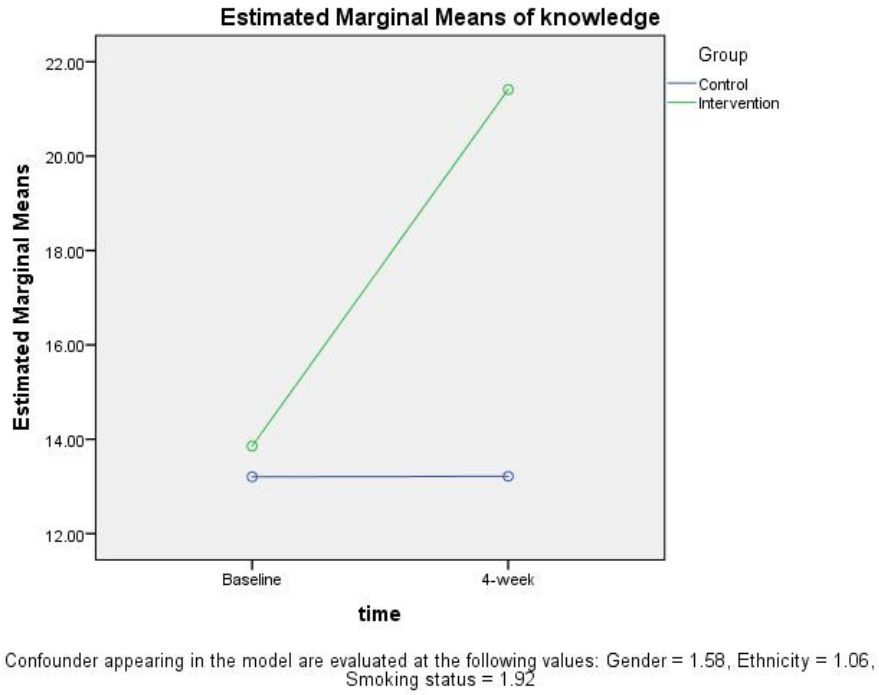

Figure 3. Comparison of mean knowledge regarding TB between each group based on time

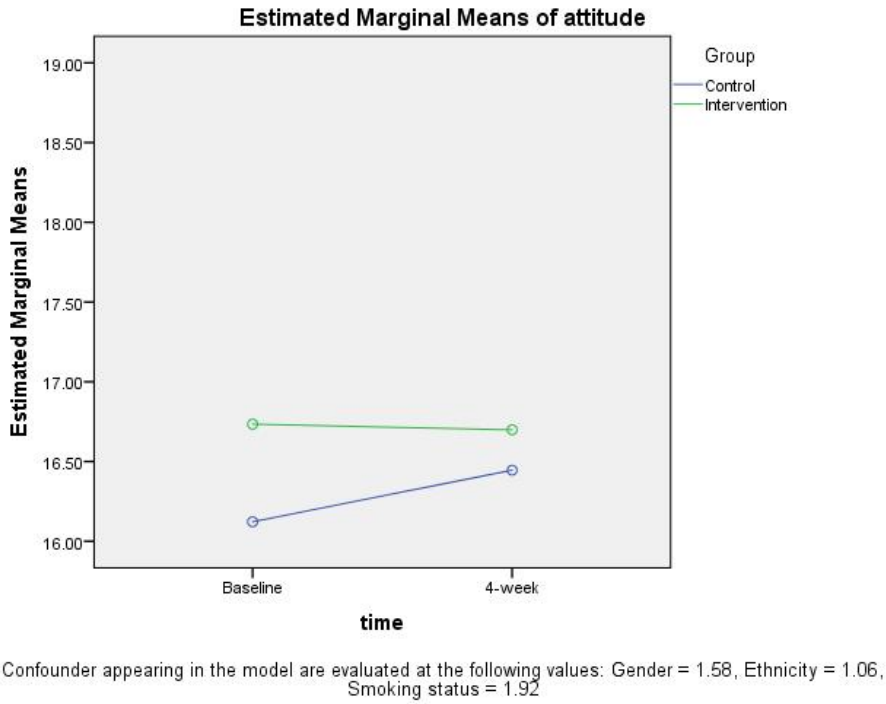

Figure 4. Comparison of mean attitude regarding TB between each group based on time

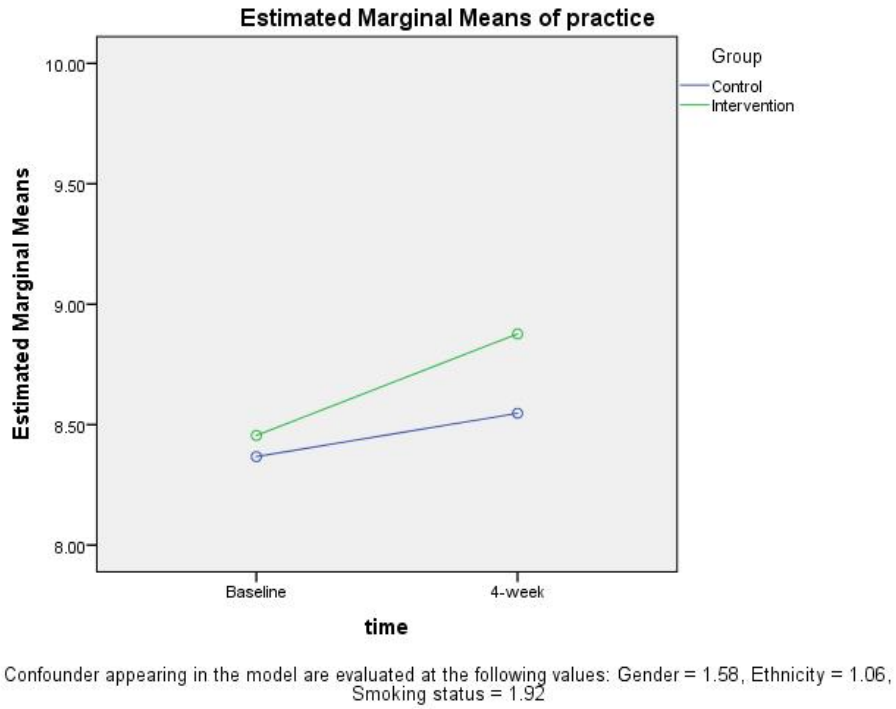

Figure 5. Comparison of mean practice regarding TB between each group based on time

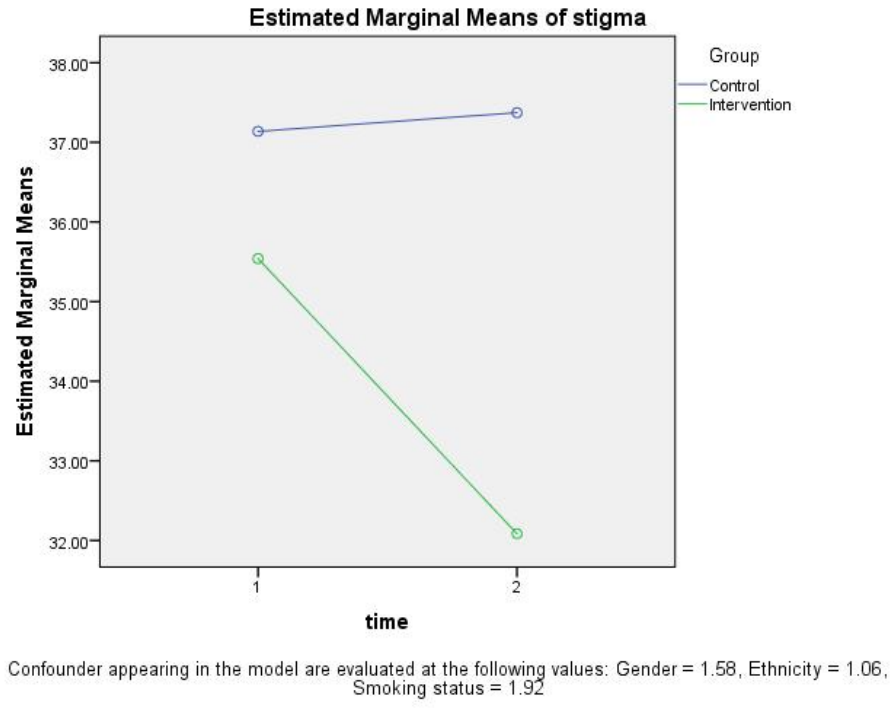

Figure 6. Comparison of mean stigma regarding TB between each group based on time

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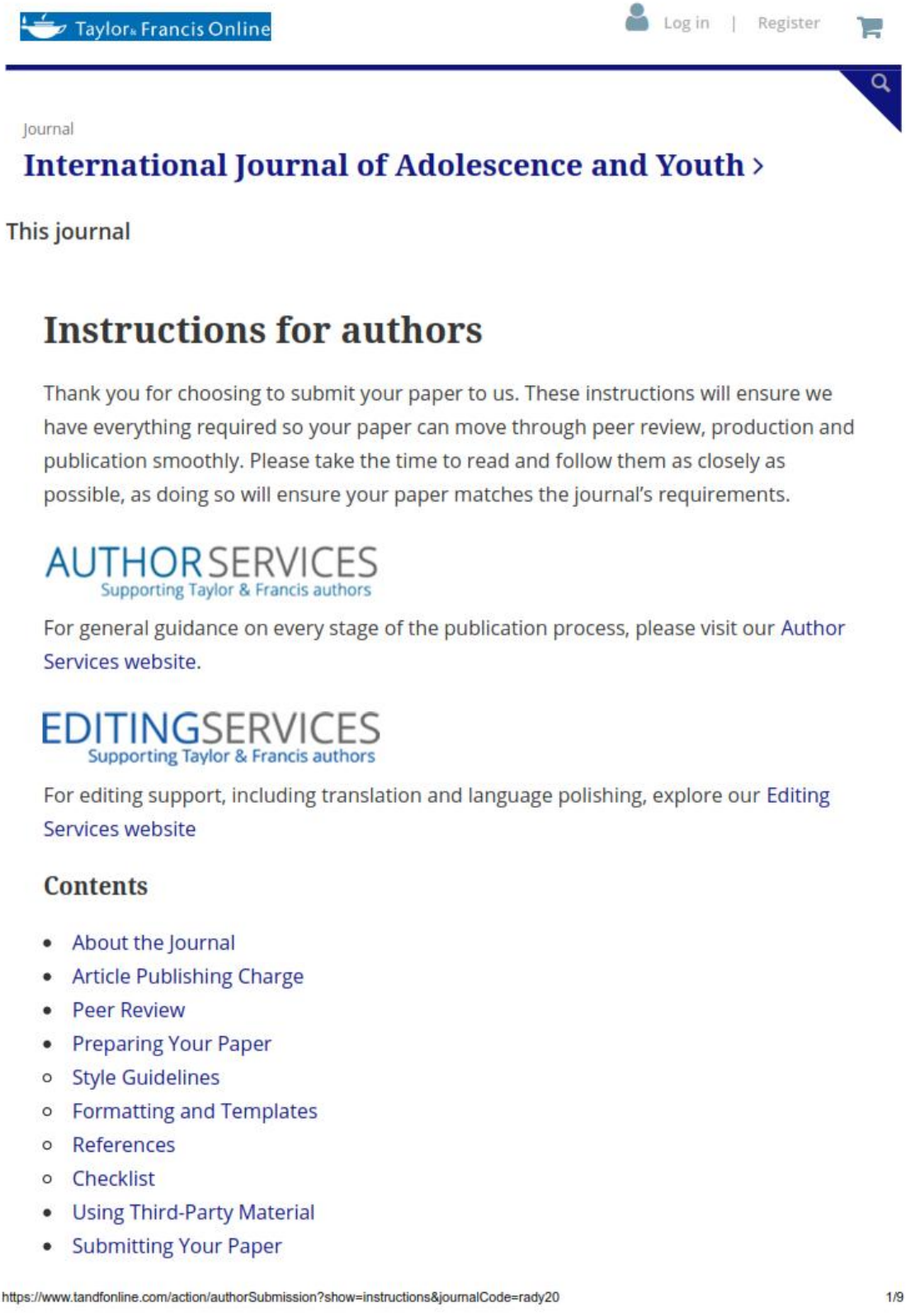

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Basic format (with one author)	Author, A. A. (Year). Title of article: And subtitle. *Journal Title*, *volume*(issue), pages. Fauci, A. S. (2002). Smallpox vaccination policy: The need for dialogue. *New England Journal of Medicine*, *346*(17), 1319–1320.
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Book	
Place of publication	Always list the city, and for the sake of consistency always include the two-letter state or province abbreviation for US and Canadian cities. Include the country name for other countries only where this is necessary to avoid ambiguity, e.g. Cambridge, MA: Harvard University Press. Cambridge, UK: Cambridge University Press. If more than one place of publication is given, use the first one listed (or the one set in the most prominent font).
Publisher	Abbreviate well-known publishers' names, e.g. "John Wiley & Sons, Ltd." may become simply "Wiley"; but retain the words "Books" and "Press". If the author and the publisher are the same, use the word "Author" as the name of the publisher.
Page numbers	List the first and last pages of a chapter or part being cited, linked with an en dash and preceded by "pp." and a space, e.g. "pp. 156–163". It is not necessary to list the extent (total pagination) of books, conference proceedings and other monographs.
Basic format (with one author)	Author, A. A. (Year). *Title of book: And subtitle*. Place: Publisher. Bandura, A. J. (1977). *Social learning theory*. Englewood Cliffs, NJ: Prentice Hall.
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Informally published	Mitchell, S. D. (2000). *The import of uncertainty*. Retrieved from http://philsci-archive.pitt.edu/archive/00000162 Kubota, K. (2007). *"Soaking" model for learning: Analyzing Japanese learning/teaching process from a socio-historical perspective*. Retrieved from ERIC database. (ED498566)
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Individual letter (in a repository)	Frank, L. K. (1935, February 4). [Letter to Robert M. Ogden]. Rockefeller Archive Center (GEB series 1.3, Box 371, Folder 3877), Tarrytown, NY.
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Website	When citing an entire website, it is sufficient just to give the address of the site in the text: The BBC (http://www.bbc.co.uk).
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CHAPTER 4: STUDY PROTOCOL

4.1 RESEARCH PROTOCOL

STUDY PROTOCOL

Research title:

The effectiveness of TB education intervention programme on knowledge, attitude, practice and stigma about tuberculosis (TB) among secondary school students in Kelantan.

Principal investigator (MMC No. if applicable):

Dr. Rosnani Zakaria (No.MPM:39374)

Co-researchers:(MMC No. if applicable):

Dr. Nik Rosmawati Binti Nik Husain (No.MPM:34746)

Prof Madya Dr Rosediani Binti Muhamad (No. MPM:34201)

PM Dr Wan Mohd Zahiruddin Bin Wan Mohammad (No.MPM:31399)

Dr. Nur Aiza Idris (No.MPM:46227)

Introduction

Tuberculosis (TB) is major global health problem as it still causes ill-health among millions of people each year. TB affects 9.6 million people worldwide and killing 1.5 million of them in 2014. The Asia Pacific region carries 56% of global TB burden accounting around 5 million TB cases (World Health Organization, 2015).

In Malaysia, TB remains problematic with the estimated case rate is 103 of 100 000 population in 2014 (World Health Organization, 2015).Kelantan is among the highest reported TB cases in Peninsular Malaysia (Ministry of Health, 2012). Out of

total TB cases in Malaysia the reported prevalence among adolescent ranges from 14.3-15.6% from year 2010-2015 (Liew, et al., 2015).

Current scenario indicates that tuberculosis is not a medical or even public health problem alone but as a social problem where innovative interventions have to be taken seriously for its effective control. WHO declared tuberculosis a global emergency in 1993, and the “stop TB partnership” proposed a global plan to stop tuberculosis, which aims to save 14 million lives between 2006 and 2015. One of the 6 components of stop TB strategy is empowering people with TB and communities (World Health Organization, 2014).

In a vast country like Malaysia, it is essential to involve every segment of the community for effective prevention and control of tuberculosis. Secondary school children are the first target to be involved for this purpose, since adolescents are accustomed to receiving instructions in classroom situations, and they are thus more receptive and responsive to special health education messages and are more inclined to assimilate the information and relay it to other household members (Centers for Disease Control and Prevention, 2016; World Health Organization, 1997). Therefore, it was decided to empower secondary school children with tuberculosis awareness programme.

The purpose of this study are to determine level of knowledge and attitude on TB among secondary school students in Pasir puteh and Pasir Mas, Kelantan and the expected duration of study is about 6 month.This study also conducted to assess the effectiveness of education intervention on knowledge and attitude about TB among secondary school students in comparing with the current education.

Problem statement & Study rationale

Tuberculosis is a disease of great significance in Malaysia. HIV/AIDS, poverty, malnutrition, over-crowded living conditions and lack of knowledge about the disease have been known to increase the risk of spreading the bacteria and the risk of developing the disease. By improving the knowledge and awareness about tuberculosis in secondary school children will spread the awareness in the general community.

Individuals with tuberculosis often suffer from health-related stigma and the social burden of illness. Weissand Ramakrishna (2006) defined health-related stigma as 'a social process or related personal experience characterized by exclusion, rejection, blame or devaluation that results from experience or reasonable anticipation of an adverse social judgement about a person or group identified with a particular health problem' (Weiss, Ramakrishna, & Somma, 2006). Stigma remains a significant challenge for tuberculosis control programs across the prevention-to-care continuum. Stigma can prevent people from getting tested for TB, from using care services, and from changing their behaviour to avoid thespread of TB (Jittimanee, et al., 2009).

This study was intended to assess the level of knowledge, attitude and practise on TB and TB stigma among secondary school children, about various aspects of tuberculosis, and to evaluate the effectiveness of education intervention on knowledge and attitude about TB.

The research hypothesis was that:

1. The KAP and stigma questionnaires on TB have good validity and reliability.
2. The levels of knowledge, attitude, and practice on TB following TB education are increased in the intervention group compared to the control group.

3. The levels of TB stigma is reduced in the intervention group compared to the control group

If this study able to demonstrate the effectiveness of education intervention programme on knowledge and attitude among secondary school children, then a school-based TB education programme is recommended to be included in the curriculum and should be implemented with the help of all the sectors involved.

Literature review

1. A study done among 400 students in University Sains Malaysia shown that majority of them have heard about TB but their knowledge about the TB and its causative factors were limited. They also found that level of negative stigma is high (Khairiah Salwa, et al., 2012).

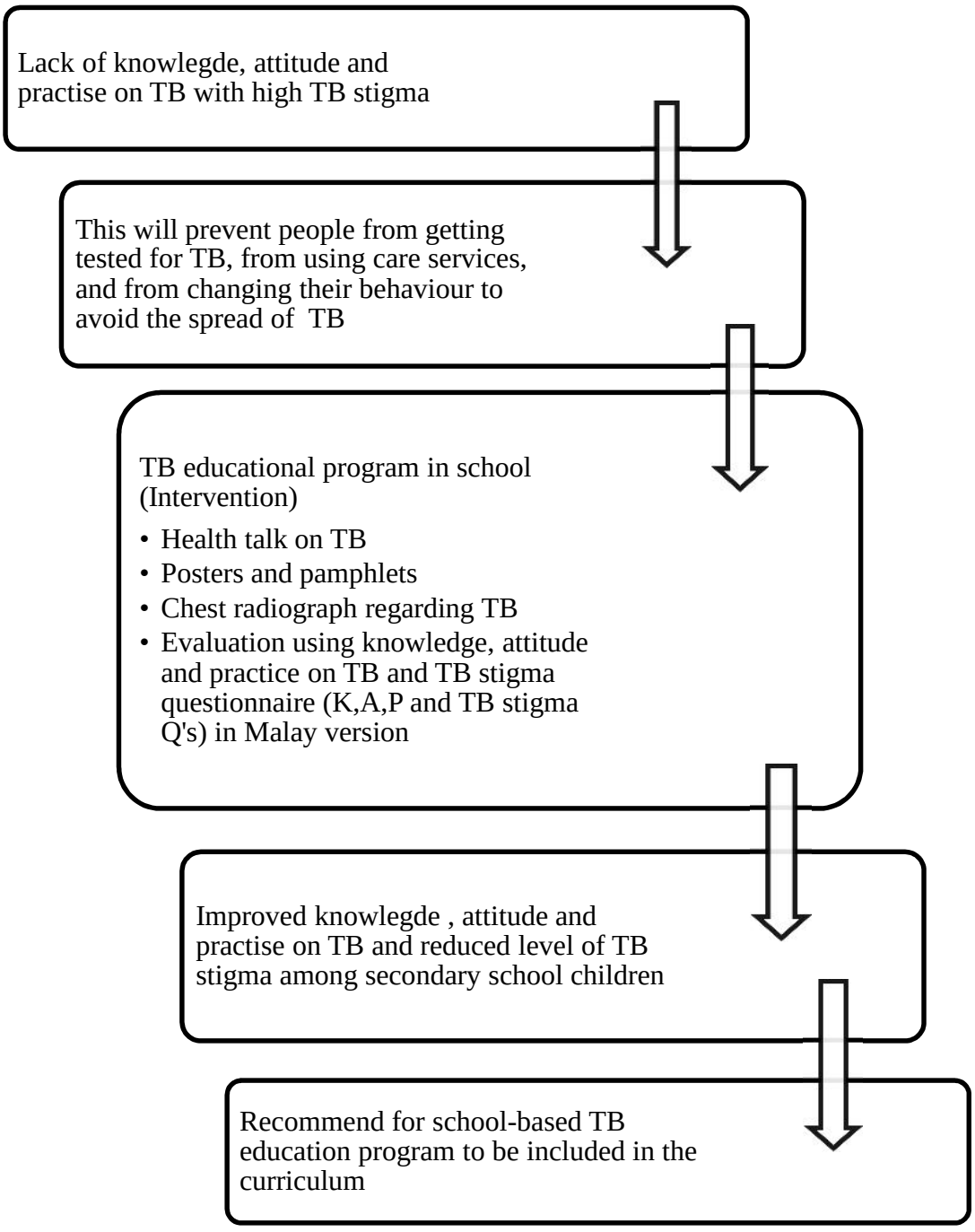
2. A qualitative study by Rundi (2010) in Sabah found and level of knowledge regarding the aetiology, spreading of disease and symptoms are very low whereas the stigma is high (Rundi, 2010).

3. A few studies have shown that this stigma have negative impact on early diagnosis, treatment and contact tracing (Chowdhury, et al., 2015; A. Courtwright and A. N. Turner, 2010; Van Rie, et al., 2008)

Target Research Question(s)

1. Do the KAP and stigma questionnaires on TB have good validity and reliability?
2. Is the level of knowledge, attitude and practise on TB still poor?
3. Is the level of TB stigma among secondary school children still high?
4. How effective is the education intervention programme in order to improve level of knowledge and attitude among secondary school children?

Conceptual framework



Objective

General:

To determine level of knowledge, attitudes, practices and stigma regarding TB among secondary school children in Kelantan and to determine the effectiveness of TB education programme among them.

Specific:

Phase 1

1. Validity and reliability of TB questionnaire on knowledge, attitude, practice and stigma.

Phase 2

3. To establish a baseline level of knowledge, attitudes and practices among secondary school children
4. To compare levels of knowledge, attitude, practice and stigma on TB following TB education programme between intervention and control group among secondary school students

Research design

Study design:

Phase 1

- Validity and reliability study on knowledge, attitude and practice on TB and TB stigma questionnaire (K,A,P and TB stigma Q's) in Malay version (Nik Rosmawati and Mohd Zahirudin, 2015). The TB stigma questionnaire was

modified from TB and HIV/AIDS-related stigma scales by Van Rie et al 2008 in English (Van Rie, et al., 2008).

- Construct validity was assessed using factor analysis with varimax rotation while reliability was assessed using Cronbach's alpha. Data will be analyse using SPSS version 20.

- Exploratory factor analysis will be done on items in the attitude and stigma section only. Knowledge will be analyse by using item response theory and practice will be analyse by descriptive analysis only.

Phase 2

School-based interventional study (Non-randomized controlled)

Study area

Phase 1

- Pasir Mas and Rantau Panjang, Kelantan

Phase 2

- Pasir Mas, Kelantan – intervention group
- Pasir Puteh, Kelantan – control group

Study population

Secondary school children who fulfill study criteria from schools selected from Pasir Mas, Rantau Panjang and Pasir Puteh, Kelantan

Subject criteria

Inclusion criteria:

- Form four students who are studying in secondary school

Exclusion criteria:

- Those who are illiterate
- Those who cannot understand Malay language.
- Those who not consented

Sample size estimation

Phase 1

To determine the sample size to validate the TB Questionnaire regarding the knowledge, attitude and practice on TB and TB stigma.

For the factor analysis the analysis ratio subject to the item 1:5 is used as reported by Conway and Huffcutt (2003) (Conway and Huffcutt, 2003) as shown in the table 1 below:

Table 1. Sample size for the factor analysis

Domain	No of item	Factor analysis	n	n + 10%
Perspective	11	5	55	61

For the internal consistency, the expected cronbach alpha of 0.85 is used:

alpha =0.05

power= 0.8

Table 2. Sample size for the internal consistency

Domain	No of items	Expected Cronbach alpha	n	n + 10%
Knowledge	25	0.85	25	28
Attitude	8	0.85	40	44
Practice	9	0.85	39	43
Perspective	11	0.85	38	42

*calculation done using StatsToDosoftware:https://www.statstodo.com/SSiz1Alpha_Pgm.php.accessed by 25 Sept 2016.

For the internal consistency, 150 to 200 sample will be used as suggested to be the optimum number of sample size for coefficient alpha (Katsis and Limakopoulou, 2005; Yurdugül, 2008).

Final sample size phase 1 is 200.

Phase 2

Sample size needed to determine the change of the knowledge, attitude and practice on TB and TB stigma among secondary school children within the group the Power and Sample Size software for comparison of two means (paired t-test) formula is used.

Alpha = 0.05, Z(0.975) = 1.959964

Beta = 0.20, Z(0.80) = 0.8416212

SD value from Nik Rosmawati (2015), TB survey in secondary school in Kelantan (Nik Rosmawati and Mohd Zahirudin, 2015).

Table 3. Sample size calculation using paired t-test (within group) for phase 2.

Domain	Sd	Delta	n	n + 20%
Knowledge	4.28	2	36	44
Attitude	2.61	1	54	66
Practise	1.49	0.5	70	84
Stigma	5.28	1.5	98	118

Sample size needed to determine the change of the knowledge, attitude and practice on TB and TB stigma among secondary school children between the group the Power and Sample Size software for comparison of two means (independent t-test) formula is used.

Alpha = 0.05, Z(0.975) = 1.959964

Beta = 0.20, Z(0.80) = 0.8416212

Table 4. Sample size calculation using independent t-test (between group) for phase 2.

Domain	Sd	Delta (δ)	n	n + 20%
Knowledge	4.89	2.0	95	115
Attitude	3.20	1.5	72	86
Practise	2.24	1.0	80	96
Stigma	7.15	3.0	90	108

Sd= the within group standard deviation.
δ = A difference in population means

The largest sample size is 118, hence the sample size for phase 2 is 118 x 2 = 236

Sampling method and subject recruitment

Phase 1

Non randomised sampling, form 4 students from 1 school in Pasir Mas and from 1 school in Rantau Panjang will be selected. These schools were selected after discussion with experience teachers and officers at Jabatan Pendidikan Negeri (JPN) Kelantan regarding schools that have a higher prevalence of smoking among their students as well as the school location- in the sub-urban and also the school academic performance were more or less similar.

Phase 2

Non randomised sampling, form 4 students from 1 school in Pasir Mas will be in the intervention group and 1 school in Pasir Puteh will be the control group.

These school were selected after discussion with experience teachers and officers at JPN, Kelantan regarding schools that have a higher prevalence of smoking among their students as well as the school location- in the sub-urban and also the school academic performance were more or less similar.

Research tool

Phase 1

The tool used in this study, i.e. questionnaire.

The questionnaires consists of 5 sections :

1. Demographic data: age, gender, ethnicity, smoking/vaping status, usage of substance abuse
2. Knowledge: 2 subdomains (TB disease- 11 items and symptoms-9 items) Knowledge score 0- wrong answer, 1- unsure answer, 2- right answer
3. Attitude: 5 items, scoring is from 1-5, 1- for strongly disagree, 5- strongly agree
4. Practice: 9 items, scoring 0- never, 1- occasionally, 2- almost all time
5. Stigma: 11 items, scoring 1-5, 1- for strongly disagree, 5- strongly agree

The scoring will reverse for negative.

Phase 2

- For control group:
    1. Health talk on "Penjagaan Kesihatan Remaja”
    2. Knowledge, attitude and practice on TB and TB stigma questionnaire (KAP and TB stigma Q's) in Malay version
    3. Poster on food pyramid and suitable exercise to be done for teenagers.
    4. Pamphlets on healthy life style and healthy diet.
    5. Quiz
- For intervention group:
    1. Health talk on "TB“
    2. Knowledge, attitude and practice on TB and TB stigma questionnaire (KAP and TB stigma Q's) in Malay version
    3. Chest radiograph and poster exhibition on TB

4. Pamphlet on TB
5. Quiz

*Knowledge, attitude and practice on TB and TB stigma questionnaire (KAP and TB stigma Q's) in Malay version in APPENDIX A.

Data collection method

Phase 1

200 students from 2 secondary school who have parental permission and agreed to participate will be given the KAP and TB stigma Q's to answer by the researcher and team, not by their teachers. There will be a short briefing beforehand to explain regarding how to fill the Q's. The student will be asking to fill the Q's independently and they will not be penalized for incorrect answer or rewarded for a correct answer. Researcher's team will be there to help the student in fill in the Q's. The completed Q's then will then be collected and all completely completed Q's will be used as data whereas the incomplete Q's will not be counted in the data collection and will be consider as drop-out.

Phase 2

Intervention group

Students in the intervention group who have parental permission and agreed to participate will be give KAP Tb & TB stigma to answer. This is consider as pre-data. They will be given a health talk on "TB" for 90 minutes and they will break for lunch. Then they will have a quiz competition on TB and TB stigma. Throughout the programme they will chest radiograph exhibition on TB and pamphlet on TB will be given.

After that they will be given the same Q's to be answered. The completed Q's then will then be collected and all completely completed Q's will be used as data whereas the incomplete Q's will not be counted in the data collection and will be consider as drop-out. This is consider as post 1.

One month afterward they will be given the same questionnaire to answer, this is consider as post 2.

Control group

Same procedure as above, the different is they will have standard care, health talk on "Penjagaan Kesihatan Remaja" for 90 minutes. Throughout the programme there will be poster on food pyramid and suitable exercise to be done for teenagers. They will also be given pamphlets on healthy life style and healthy diet.

One month afterward they will be given the same questionnaire to answer, this will consider as post-data and then they will also have TB education programme that day.

Data analysis

Phase 1

Data entry and data analysis for exploratory factor analysis will do for construct validity using SPSS version 22.

Expected Results or dummy tables for Phase 1: To determine the validity and reliability of knowledge, attitude and practice on TB and TB stigma questionnaire, which include content validity and construct validity.

Table 1: Factor loadings and reliability analysis for TB Questionnaire regarding the knowledge, attitude and practice on TB and TB stigma

Item/Statement	Factor/ Domain[ж]	Factor loading[¥]	CITC[φ]	α if Item Deleted[Ω]	α[Ω]
	1 Knowledge				
	2 Attitude				
	3 Practice				
	4 Stigma				

[¥]Factor Analysis; Principal axis factoring extraction with Promax rotation will be applied
[ж]Domain were formed based on Exploratory Factor Analysis
[φ]CITC: Corrected Item-Total Correlation
[Ω]α: Cronbach's Alpha

Table 2: The baseline characteristics of respondents

Variables	Intervention Group		Control Group		P-value*
	Mean (SD) / Median (IQR)	Freq (%)	Mean (SD) / Median (IQR)	Freq (%)	
⁾ Age					
⁾ Gender					
⁾ Ethnicity					
⁾ Smoking status					
⁾ Vaping status					
⁾ Usage of substance abuse					

*Independent t-test or chi square test

Phase 2

The data will be analysed using SPSS software version 22 using Repeated Measure ANOVA to compare the means score within the groups and also between the groups.

Expected results or Dummy Table: The effectiveness of TB education programme among secondary school students in Kelantan

Table 3: Mean difference of KAP and Stigma on TB between intervention and control groups, regardless of time, group by using repeated measures ANOVA between group analysis

Domain	**Mean difference (95% CI)**	**Repeated measure ANOVA**		
		F-statistics (df) and p-value		
		between	**within**	**interaction**
Knowledge				
Attitude				
Practice				
Stigma				

Table 4: Comparison of mean KAP and Stigma on TB within each group based on time by using repeated measures ANOVA

Comparison	**Intervention**		**Control**		**Intervention vs control**	
	Adj. mean (95% CI)	**p-value**	**Adj. mean (95% CI)**	**p-value**	**Adj.mean diff. (95% CI)**	**p-value**
Knowledge on TB Pre - Post						
Attitude on TB Pre - Post						
Practice on TB Pre - Post						
Stigma on TB Pre – Post						

Ethical consideration:

1. **Subject vulnerability**

The subjects are secondary school children (age less than 18 years old)

- Because children cannot legally provide consent for research on their own behalf, permission from at least one parent/guardian required
- Assent of the child required if they are likely to comprehend and appreciate what it would mean to volunteer to participate in a given protocol.

-) Expedited level of review necessary

2. **Declaration of absence of conflict of interest**

   Not applicable

3. **Privacy and confidentiality**

   All forms are anonymous and will be entered into SPSS software. Only research team members can access the data. Data will be presented as grouped data and will not identify the responders individually.

4. **Community sensitivities and benefits**

   In view of lacking TB knowledge, high stigma and persisting high level of prevalence and severity of the disease in the community, conducting intervention study is crucial.

   This is especially among adolescent group who due to this reason and the facts that adolescent is among the highest proportion of overall population in Malaysia currently, they are also very active in media networking and able to comprehend new information hence they are ideal for the task of disseminating knowledge regarding TB in the community.

   Another reason is they are known to have high risk exposure towards risky behaviour such as smoking and drugs misuse that can expose them to HIV infection, which will later predispose toward TB infection.

   The control group will be receiving the benefit of intervention by giving it after post-evaluation.

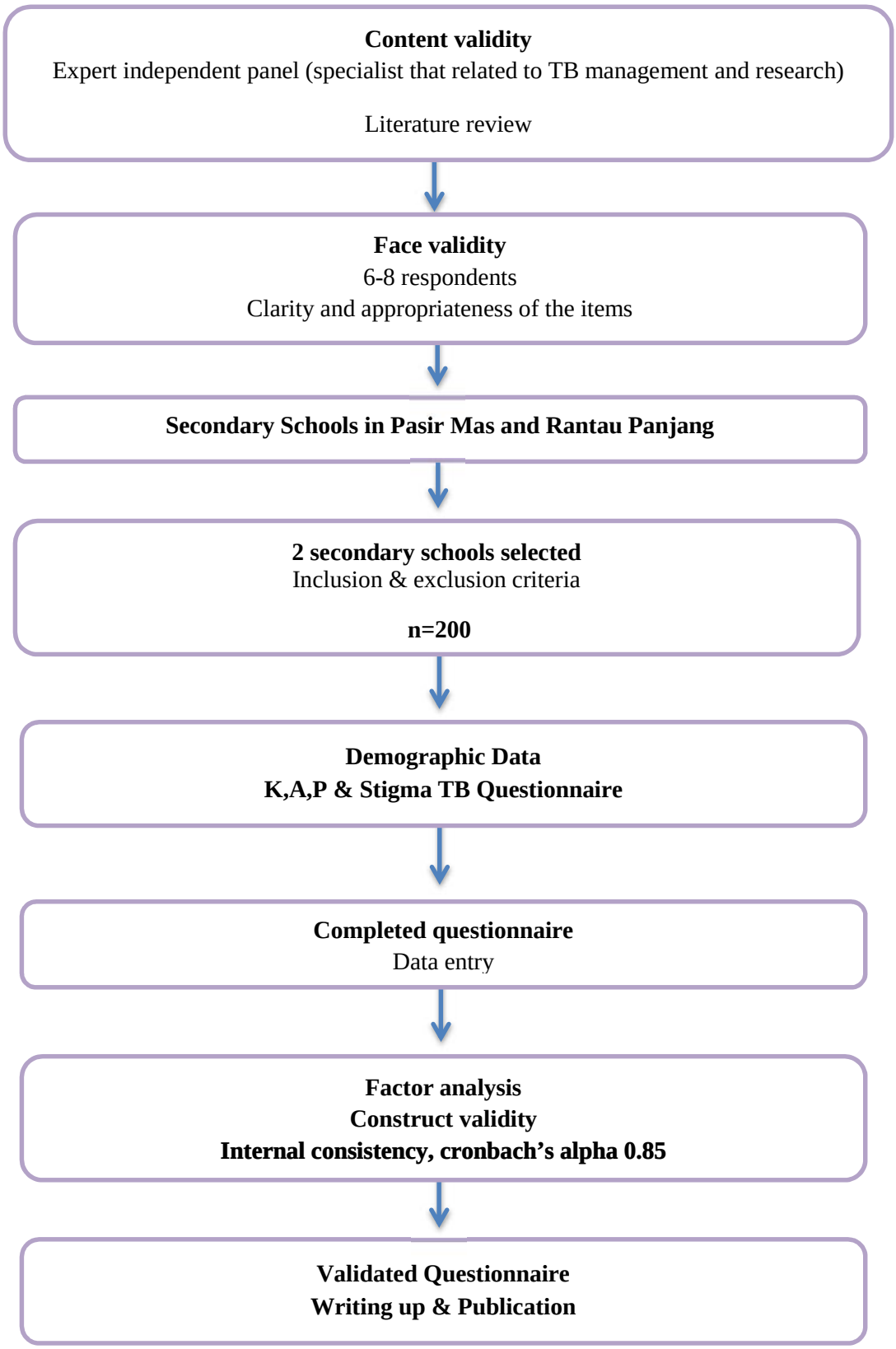
5. **Honorarium and incentives**

   Token of appreciation will be given to all responders.

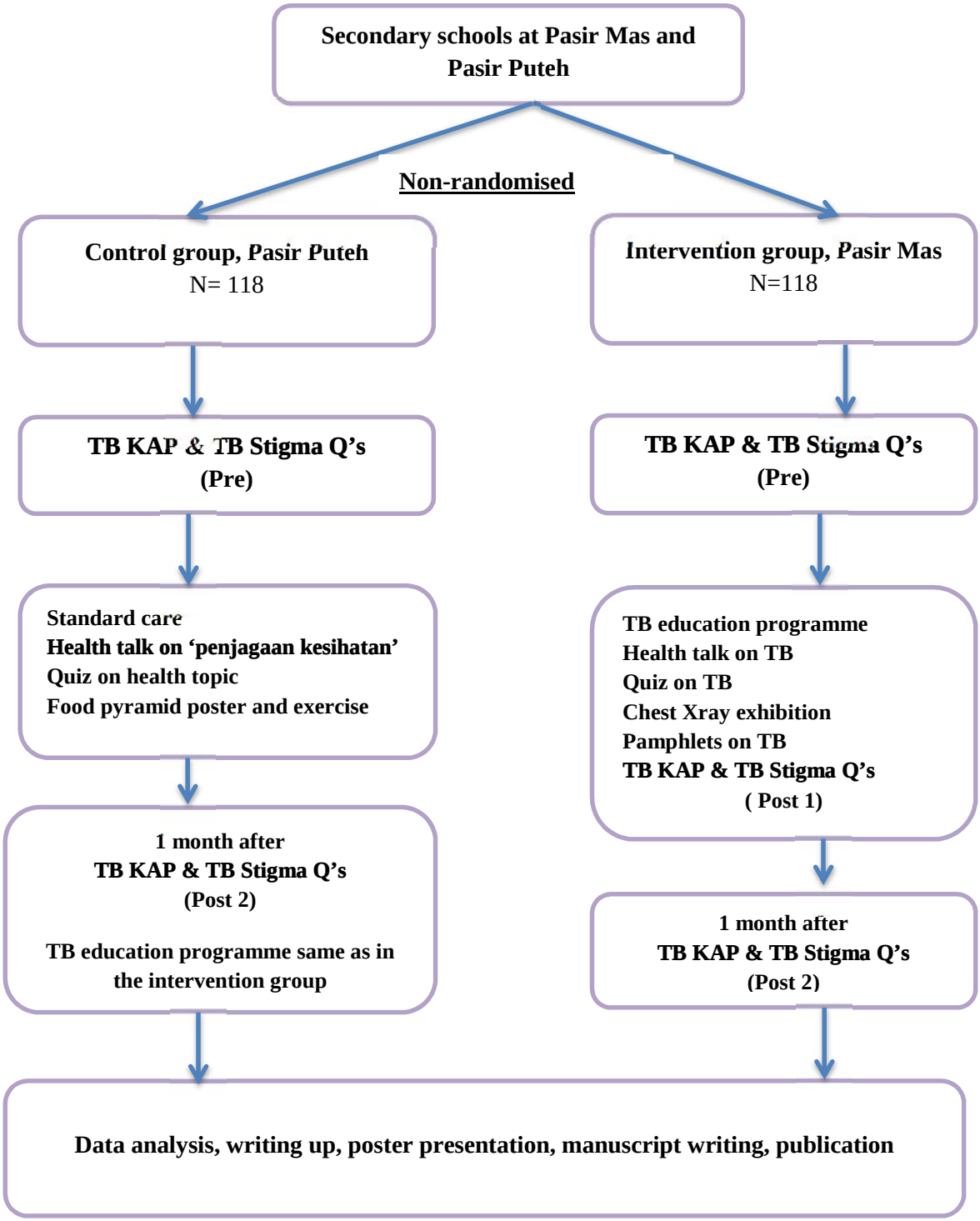
Study Flow Chart

The methodology of this study is summarized graphically as below:

Phase 1 Validation of KAP, Stigma TB Questionnaire**:**



Phase 2: The effectiveness of TB education among secondary school students



GANTT CHART

PROJECT ACTIVITIES	2017							2018												2019												2020		
Research Activities	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**
Data Collection		→	→	→	→																													
Data Analysis / Interpretation							→	→	→	→	→	→	→	→	→	→																		
Dissertation writing																	→	→	→	→	→	→	→	→	→	→	→	→						
Submission of paper presentation and publication																												→	→	→	→			
Viva defense																																	→	

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4.2 PATIENT INFORMATION AND CONSENT FORMS

PERSETUJUAN REMAJA-KEBENARAN IBUBAPA

Borang ini juga dikenali sebagai "Persetujuan Remaja" dan "Borang kebenaran untuk penyertaan remaja dalam kajian". Dalam keaadan ini, "anda" merujuk kepada "anak anda".

MAKLUMAT KAJIAN

Tajuk Kajian: **Kajian mengenai keberkesanan intervensi modul pembelajaran tentang penyakit tuberkulosis (TB) terhadap pengetahuan, sikap, amalan dan stigma di kalangan pelajar sekolah menengah di Kelantan.**

Nama Penyelidik: Dr. Rosnani Zakaria (No.MPM:39374)
Dr. Nik Rosmawati Binti Nik Husain (No.MPM:34746)
Prof Madya Dr Rosediani Binti Muhamad (No. MPM:34201)
PM Dr Wan Mohd Zahiruddin Bin Wan Mohammad (No.MPM:31399)
Dr. Nur Aiza Idris (No.MPM:46227)

PENGENALAN

Anda dipelawa untuk menyertai satu kajian penyelidikan secara sukarela. Sebelum menyertai kajian ini, anda dikehendaki membaca dan memahami borang kajian ini. Borang ini akan menerangkan tujuan kajian, prosedur, dan manfaat kajian. Ia juga menerangkan bahawa anda boleh menarik diri daripada kajian ini pada bila-bila masa sahaja. Jika anda bersetuju menyertai kajian ini anda akan menerima salinan borang ini untuk simpanan anda.

Kebenaran daripada ibu bapa atau penjaga anda juga diperlukan. Anda boleh berhenti daripada menyertai kajian ini, walaupun ibu bapa atau penjaga anda telah memberikan kebenaran mereka .Anda dan ibu bapa atau penjaga anda boleh berbincang dengan ahli keluarga ataupun rakan. Jika anda ingin menyertai kajian ini, anda dan ibu/bapa/penjaga anda diminta untuk menandatangani borang ini.

Sehubungan itu, anda diminta agar membaca dan memahami segala keterangan di bawah yang akan menberi penerangan lanjut tentang kajian ini.

TUJUAN KAJIAN

Kajian ini bertujuan adalah untuk menilai tahap pengetahuan dan sikap terhadap TB di kalangan pelajar sekolah menengah di Kelantan selama 6 bulan dalam tempoh kajian. Kajian ini adalah untuk menilai keberkesanan intervensi modul pembelajaran terhadap pengetahuan, sikap, amalan dan stigma terhadap TB di kalangan pelajar sekolah menengah dibandingkan dengan kaedah pembelajaran yang diamalkan sekarang.

KELAYAKAN PENYERTAAN

Kajian ini akan melibatkan kira-kira 200 orang peserta di kalangan pelajar sekolah menengah. Doktor yang bertanggungjawab dalam kajian ini atau salah seorang kakitangan kajian telah membincangkan kelayakan untuk menyertai kajian ini dengan anda. Adalah penting anda berterus terang dengan doktor dan kakitangan tersebut tentang sejarah kesihatan anda. Anda tidak seharusnya menyertai kajian ini sekiranya anda tidak memenuhi semua syarat kelayakan.

Beberapa keperluan untuk menyertai kajian ini adalah :

- Anda adalah pelajar di sekolah menengah di Pasir Mas atau Pasir Puteh, Kelantan.

Anda tidak boleh menyertai kajian ini sekiranya :

- Anda buta huruf.
- Anda tidak boleh mamahami Bahasa Malaysia.
- Anda tidak mendapat kebenaran daripada penjaga.

PROSEDUR-PROSEDUR KAJIAN

Selepas anda memberi persetujuan bertulis utuk menyertai kajian ini, anda akan diminta untuk mengisi borang soal selidik mengenai data peribadi serta menjawab soalan mengenai penegetahuan dan sikap anda mengenai penyakit TB. Anda kemudiannya akan mengikuti satu sesi pembelajaran tentang pengetahuan dan sikap terhadap penyakit TB mengikut kumpulan yang telah ditetapkan. Selepas mengikuti sesi pembelajaran tersebut, anda akan diminta sekali lagi untuk mengisi borang soal selidik yang sama untuk menilai keberkesanan sesi pengajaran tersebut. Jika anda mempunyai sebarang kemusykilan atau tidak memahami mana-mana bahagian di dalam soal-selidik tersebut, anda bolehlah merujuk masalah tersebut kepada penyelidik yang akan sentiasa berasa di situ bagi membantu anda.

RISIKO

Tiada sebarang risiko yang akan ditanggung oleh anda jika anda menyertai kajian ini.

PENYERTAAN DALAM KAJIAN

Penyertaan anda dalam kajian ini adalah secara sukarela. Anda berhak menolak untuk menyertai kajian ini atau anda boleh menamatkan penyertaan anda pada bila-bila masa, tanpa sebarang hukuman atau kehilangan manfaat yang sepatutnya anda perolehi. Anda juga boleh menolak untuk menyertai kajian ini walaupun ibu/bapa atau penjaga anda telah memberi keizinan mereka. Anda akan menerima penghargaan yang setimpal bagi sumbangan anda dalam menjayakan kajian ini.

MANFAAT YANG MUNGKIN [Manfaat terhadap Individu, Masyarakat, Universiti]

Prosedur kajian ini akan diberikan kepada anda tanpa kos. Kajian ini adalah penting untuk menilai tahap keberkesanan intervensi modul pembelajaran tentang penyakit TB sebagai satu strategi intervensi penambahbaikan dalam meningkatkan pengetahuan, sikap, amalan dan stigma terhadap perkara yang berkaitan tentang penyakit TB di kalangan pelajar sekolah menengah. Melalui hasil kajian ini, keberkesanan intervensi modul pembelajaran ini akan dapat dibuktikan dan digunapakai sebagai satu strategi intervensi bagi program promosi kesihatan berkaitan dengan penyakit TB.

PERSOALAN

Sekiranya anda mempunyai sebarang soalan mengenai prosedur kajian ini atau hak-hak anda, sila hubungi;

Dr. Rosnani Zakaria (No.MMC:39374)
Tel: 019-9866763

Dr. Nur Aiza Idris (No.MPM:46227)
Tel: 013-9313150

Sekiranya anda mempunyai sebarang soalan berkaitan kelulusan Etika atau sebarang pertanyaan dan masalah berkaitan kajian ini, sila hubungi;

En. Mohd Bazlan Hafidz Mukrim
Setiausaha Jawatankuasa Etika Penyelidikan (Manusia) USM
Pusat Inisiatif Penyelidikan -Sains Klinikal & Kesihatan
USM Kampus Kesihatan.
No. Tel: 09-767 2354 / 09-767 2362
Email : bazlan@usm.my/jepem@usm.my

KERAHSIAAN

Maklumat perubatan anda akan dirahsiakan oleh doktor dan kakitangan kajian.Ianya tidak akan dedahkan secara umum melainkan jika ia dikehendaki oleh undang-undang.

Data yang diperolehi dari kajian yang tidak mengenalpasti anda secara perseorangan mungkin akan diterbitkan untuk tujuan memberi pengetahuan baru.

Rekod anda yang asal mungkin akan dilihat oleh pihak penyelidik, Lembaga Etika kajian ini dan pihak berkuasa regulatori untuk tujuan mengesahkan prosedur dan/atau data kajian klinikal. Maklumat anda mungkin akan disimpan dalam komputer dan diproses dengannya.

Dengan menandatangani borang persetujuan ini, anda membenarkan penelitian rekod, penyimpanan maklumat dan pemindahan data seperti yang dihuraikan di atas.

TANDATANGAN

Untuk dimasukkan ke dalam kajian ini, ibu/bapa, penjaga yang sah atau wakil yang sah mesti menandatangani borang ini sebagai kebenaran untuk anda menyertai kajian ini. Di samping itu anda atau wakil sah anda mesti menandatangani serta mencatatkan tarikh halaman tandatangan (Lihat contoh Borang Keizinan Pesakit di LAMPIRAN S atau LAMPIRAN P).

BORANG KEIZINAN PESERTA

(Halaman Tandatangan)

Tajuk Kajian: **Kajian mengenai keberkesanan intervensi modul pembelajaran tentang penyakit TB terhadap pengetahuan,sikap, amalan dan stigma di kalangan pelajar sekolah menengah di Kelantan**

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PM Dr Wan Mohd Zahiruddin Bin Wan Mohammad (No.MPM:31399)
Dr. Nur Aiza Idris (No.MPM:46227)

Untuk menyertai kajian ini, anda atau wakil sah anda mesti menandatangani mukasurat ini. Dengan menandatangani mukasurat ini, saya mengesahkan yang berikut:

- Saya telah membaca semua maklumat dalam Borang Maklumat dan Keizinan Pesakit ini termasuk apa-apa maklumat berkaitan risiko yang ada dalam kajian dan saya telah pun diberi masa yang mencukupi untuk mempertimbangkan maklumat tersebut.
- Semua soalan-soalan saya telah dijawab dengan memuaskan.
- Saya, secara sukarela, bersetuju menyertai kajian penyelidikan ini, mematuhi segala prosedur kajian dan memberi maklumat yang diperlukan kepada peneylidik dan juga kakitangan lain yang berkaitan apabila diminta.
- Saya boleh menamatkan penyertaan saya dalam kajian ini pada bila-bila masa.
- Saya telah pun menerima satu salinan Borang Maklumat dan Keizinan Pesakit untuk simpanan peribadi saya.

BAHAGIAN PESERTA KAJIAN

Nama Peserta (Dicetak atau Ditaip)

Nama Singkatan & No. Peserta

Tandatangan peserta kajian

Tarikh (dd/mm/yy)

BAHAGIAN IBUBAPA/PENJAGA

Saya telah meneliti maklumat kajian di atas dan telah diberi peluang untuk bertanyakan soalan. Dan persoalan saya telah diberi penerangan dan dengan itu saya membenarkan penyertaan anak/jagaan saya di dalam kajian ini.

Nama ibubapa/ penjaga

No.Kad Pengenalan ibubapa/penjaga

Tandatangan Wakil Sah (ibubapa/penjaga)

Tarikh (dd/mm/yy)

BAHAGIAN PENYELIDIK

Saya telah menerangkan maklumat kajian kepada peserta dan juga ibu/bapa/penjaganya, dan telah menjawab segala persoalan mereka. Saya percaya peserta dan ibubapa memahami maklumat yang disertakan dan sukarela memberi kebenaran untuk menyertai kajian ini.

.

Nama & Tandatangan Individu yang Mengendalikan Perbincangan Keizinan (Dicetak atau Ditaip)	Tarikh (dd/MM/yy)
Nama Saksi dan Tandatangan	Tarikh (dd/MM/yy)

Nota: i) Semua subjek/pesakit yang mengambil bahagian dalam projek penyelidikan ini tidak dilindungi insuran.

BORANG KEIZINAN BAGI PENERBITAN BAHAN YANG BERKAITAN DENGAN PESERTA

(Halaman Tandatangan)

Tajuk Kajian: **Kajian mengenai keberkesanan intervensi modul pembelajaran tentang penyakit TB terhadap pengetahuan, sikap, amalan dan stigmadi kalangan pelajar sekolah menengah di Kelantan.**

Nama Penyelidik: Dr. Rosnani Zakaria (No.MPM:39374)
Dr. Nik Rosmawati Binti Nik Husain (No.MPM:34746)
Prof Madya Dr Rosediani Binti Muhamad (No. MPM:34201)
PM Dr Wan Mohd Zahiruddin Bin Wan Mohammad (No.MPM:31399)
Dr. Nur Aiza Idris (No.MPM:46227)

Untuk menyertai kajian ini, anda atau wakil sah anda mesti menandatangani mukasurat ini.

Dengan menandatangani mukasurat ini, saya memahami yang berikut:

- Bahan yang akan diterbitkan tanpa dilampirkan dengan nama saya dan setiap percubaan yang akan dibuat untuk memastikan ketanpanamaan saya. Saya memahami, walaubagaimanapun, ketanpanamaan yang sempurna tidak dapat dijamin. Kemungkinan sesiapa yang mengendalikan kajian ini saudara dapat mengenali saya.
- Bahan yang akan diterbitkan dalam penerbitan mingguan/bulanan/dwibulanan/suku tahunan/dwi tahunan merupakan satu penyebaran yang luas dan tersebar ke seluruh dunia. Kebanyakan penerbitan ini akan tersebar kepada doktor-doktor dan juga bukan doktor termasuk ahli sains dan ahli jurnal.
- Bahan tersebut juga akan dilampirkan pada laman web jurnal di seluruh dunia. Sesetengah laman web ini bebas dikunjungi oleh semua orang.
- Bahan tersebut juga akan digunakan sebagai penerbitan tempatan dan disampaikan oleh ramai doktor dan ahli sains di seluruh dunia.
- Bahan tersebut juga akan digunakan sebagai penerbitan buku oleh penerbit jurnal.
- Bahan tersebut tidak akan digunakan untuk pengiklanan ataupun bahan untuk membungkus.

Saya juga memberi keizinan bahawa bahan tersebut boleh digunakan sebagai penerbitan lain yang diminta oleh penerbit dengan kriteria berikut:

- Bahan tersebut tidak akan digunakan untuk pengiklanan atau bahan untuk membungkus.
- Bahan tersebut tidak akan digunakan di luar konteks – contohnya: Gambar tidak akan digunakan untuk menggambarkan sesuatu artikel yang tidak berkaitan dengan subjek dalam foto tersebut.

BAHAGIAN PESERTA KAJIAN

Nama Peserta(Dicetak atau Ditaip)

Nama Singkatan &No. Peserta

Tandatangan peserta kajian

Tarikh (dd/MM/yy)

BAHAGIAN IBUBAPA/PENJAGA

Saya telah meneliti maklumat kajian di atas dan telah diberi peluang untuk bertanyakan soalan.Dan persoalan saya telah diberi penerangan dan dengan itu saya membenarkan penyertaan anak/jagaan saya di dalam kajian ini.

Nama ibubapa/ penjaga

Tandatangan Wakil Sah (ibubapa/penjaga)

Tarikh (dd/MM/yy)

BAHAGIAN PENYELIDIK

Nama & Tandatangan Individu yang Mengendalikan Perbincangan Keizinan (Dicetak atau Ditaip)	Tarikh (dd/MM/yy)

Nota: i) Semua subjek/pesakit yang mengambil bahagian dalam projek penyelidikan ini tidak dilindungi insuran.

Participant's Information and Consent Form

(Signature Page)

Research Title: **The effectiveness of education intervention on knowledge, attitude, practice and stigma about TB among secondary school students in Kelantan.**

Researcher's Name: Dr. Rosnani Zakaria (No.MPM:39374)
Dr. Nik Rosmawati Binti Nik Husain (No.MPM:34746)
Prof Madya Dr Rosediani Binti Muhamad (No. MPM:34201)
PM Dr Wan Mohd Zahiruddin Bin Wan Mohammad (No.MPM:31399)
Dr. Nur Aiza Idris (No.MPM:46227)

To become a part this study, you and your legal representative must sign this page. By signing this page, I am confirming the following:

- I have read all of the information in this Participant Information and Consent Form including any information regarding the risk in this study and I have had time to think about it.
- All of my questions have been answered to my satisfaction.
- I voluntarily agree to be part of this research study, to follow the study procedures, and to provide necessary information to the doctor, nurses, or other staff members, as requested.
- I may freely choose to stop being a part of this study at anytime.
- I have received a copy of this Participant Information and Consent Form to keep for myself.

SIGNATURE OF RESEARCH PARTICIPANT AND PARENTS

Participant Name (Print or type)

Participant Initials and Number

Signature of Participant

Date (dd/MM/yy)

(Add time if applicable)

SIGNATURE OF PARENT(S)/LEGALLY AUTHORIZED REPRESENTATIVE

I have read the information provided above. I have been given a chance to ask questions. My questions have been answered to my satisfaction, and I agree to allow my child/ward participate in this study. I have been given a copy of this form.

Name of Parent/Legally Authorized Representative

I.C Number

Signature of Parent/Legally Authorized Representative

Date (dd/MM/yy)

(Add time if applicable)

SIGNATURE OF INVESTIGATOR

I have explained the research to the participant and his/her parent(s)/Legally Authorized Representative, and answered all of their questions. I believe that the parent(s) understand the information described in this document and freely consents to participate.

_____

Name of Person Obtaining Consent

_____ _____

Signature of Person Obtaining Consent Date (dd/MM/yy)

Note: i) All subject/patients who are involved in this study will not be covered by insurance.

ATTACHMENT P

Participant's Material Publication Consent Form

Signature Page

Research Title: **The effectiveness of education intervention on knowledge, attitude, practice and stigma about TB among secondary school students in Kelantan**

Researcher's Name*:* Dr. Rosnani Zakaria (No.MPM:39374)
Dr. Nik Rosmawati Binti Nik Husain (No.MPM:34746)
Prof Madya Dr Rosediani Binti Muhamad (No. MPM:34201)
PM Dr Wan Mohd Zahiruddin Bin Wan Mohammad (No.MPM:31399)
Dr. Nur Aiza Idris (No.MPM:46227)

To become a part this study, you or your legal representative must sign this page.

By signing this page, I am confirming the following:

- I understood that my name will not appear on the materials published and there have been efforts to make sure that the privacy of my name is kept confidential although the confidentiality is not completely guaranteed due to unexpected circumstances.

- I have read the materials or general description of what the material contains and reviewed all photographs and figures in which I am included that could be published.

- I have been offered the opportunity to read the manuscript and to see all materials in which I am included, but have waived my right to do so.

- All the published materials will be shared among the medical practitioners, scientists and journalist worldwide.

- The materials will also be used in local publications, book publications and accessed by many local and international doctors worldwide.

- I hereby agree and allow the materials to be used in other publications required by other publishers with these conditions:

- The materials will not be used as advertisement purposes nor as packaging materials.

- The materials will not be used out of contex – i.e.: Sample pictures will not be used in an article which is unrelated subject to the picture.

Participant Name (Print or type) Participant Initials or Number

Participant's Signature Date (dd/MM/yy)

Name of Parent/Legally Authorized Representative I.C Number

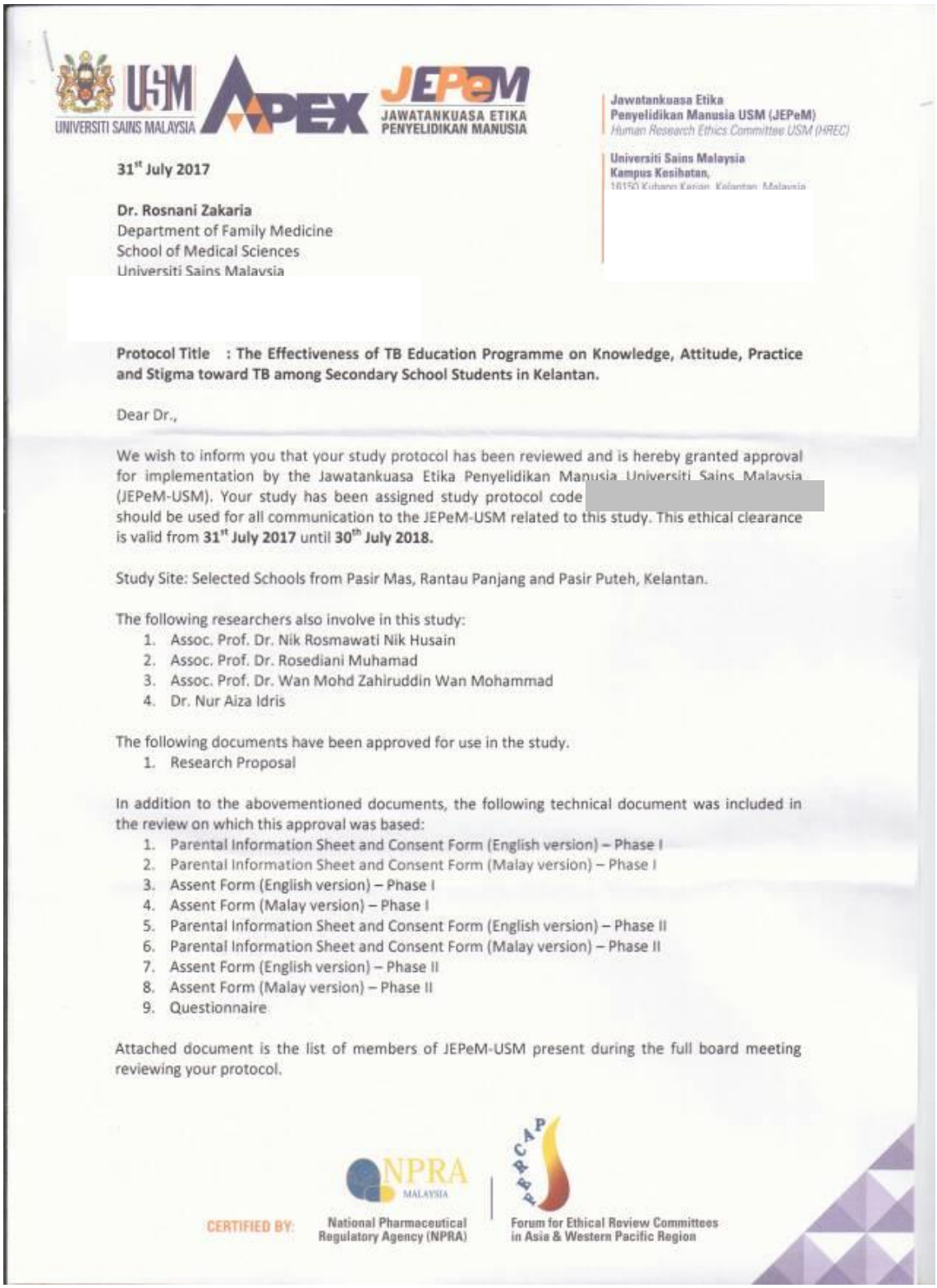
Signature of Parent/Legally Authorized Representative Date (dd/MM/yy)

Name and Signature of Individual Date (dd/MM/yy)

Conducting Consent Discussion

Note: i) All subject/patients who are involved in this study will not be covered by insurance.

4.3 ETHICAL APPROVAL LETTER



UNIVERSITI SAINS MALAYSIA

JAWATANKUASA ETIKA PENYELIDIKAN MANUSIA

Jawatankuasa Etika
Penyelidikan Manusia USM (JEPeM)
Human Research Ethics Committee USM (HREC)

Universiti Sains Malaysia
Kampus Kesihatan,

31st July 2017

Dr. Rosnani Zakaria
Department of Family Medicine
School of Medical Sciences
Universiti Sains Malaysia

Protocol Title : The Effectiveness of TB Education Programme on Knowledge, Attitude, Practice and Stigma toward TB among Secondary School Students in Kelantan.

Dear Dr.,

We wish to inform you that your study protocol has been reviewed and is hereby granted approval for implementation by the Jawatankuasa Etika Penyelidikan Manusia Universiti Sains Malaysia (JEPeM-USM). Your study has been assigned study protocol code [redacted] should be used for all communication to the JEPeM-USM related to this study. This ethical clearance is valid from **31st July 2017** until **30th July 2018.**

Study Site: Selected Schools from Pasir Mas, Rantau Panjang and Pasir Puteh, Kelantan.

The following researchers also involve in this study:

1. Assoc. Prof. Dr. Nik Rosmawati Nik Husain
2. Assoc. Prof. Dr. Rosediani Muhamad
3. Assoc. Prof. Dr. Wan Mohd Zahiruddin Wan Mohammad
4. Dr. Nur Aiza Idris

The following documents have been approved for use in the study.

1. Research Proposal

In addition to the abovementioned documents, the following technical document was included in the review on which this approval was based:

1. Parental Information Sheet and Consent Form (English version) – Phase I
2. Parental Information Sheet and Consent Form (Malay version) – Phase I
3. Assent Form (English version) – Phase I
4. Assent Form (Malay version) – Phase I
5. Parental Information Sheet and Consent Form (English version) – Phase II
6. Parental Information Sheet and Consent Form (Malay version) – Phase II
7. Assent Form (English version) – Phase II
8. Assent Form (Malay version) – Phase II
9. Questionnaire

Attached document is the list of members of JEPeM-USM present during the full board meeting reviewing your protocol.

CERTIFIED BY: National Pharmaceutical Regulatory Agency (NPRA) | Forum for Ethical Review Committees in Asia & Western Pacific Region

CHAPTER 5: APPENDICES

5.1 APPENDIX A : Research tool

SOAL SELIDIK BERKAITAN PENYAKIT TUBERKULOSIS (TB)

BIODATA RINGKAS

No. fail

1 **Umur** _____ Tahun

2 **Jantina**

a. Lelaki ☐

b. Perempuan ☐

3 **Bangsa**

a. Melayu ☐

b. Cina ☐

c. Siam ☐

d. Lain – lain ☐

4 **Rokok**

a. Ya ☐

b. Tidak ☐

5 **Vape**

a. Ya ☐

b. Tidak ☐

6 **Penggunaan bahan larangan**

a. Ya ☐

b. Tidak ☐

Soalan-soalan berikut adalah bagi menilai tahap pengetahuan anda terhadap penyakit TB. Sila tandakan pada kotak jawapan yang berkenaan.

A PENGETAHUAN TENTANG PENYAKIT TB

		Ya	Tidak	Tidak pasti
1	TB adalah satu penyakit berjangkit	☐	☐	☐
2	TB disebabkan oleh kuman	☐	☐	☐
3	TB boleh tersebar melalui perkongsian bekas makanan	☐	☐	☐
4	Paru-paru adalah bahagian badan yang paling kerap diserang TB	☐	☐	☐
5	Penyakit TB boleh dirawat	☐	☐	☐
6	TB boleh membawa maut jika tidak dirawat dengan sempurna	☐	☐	☐
7	Rawatan TB di Negara ini adalah percuma	☐	☐	☐
8	Merokok tidak ada kaitan dengan TB	☐	☐	☐
9	Bilangan kes TB di Negara ini masih tinggi	☐	☐	☐
10	Orang yang dijangkiti HIV mudah mendapat penyakit TB	☐	☐	☐
11	Pemakanan yang seimbang boleh mengurangkan jangkitan TB	☐	☐	☐

	Tanda dan gejala yang penyakit TB adalah seperti berikut:			
		Ya	Tidak	Tidak pasti
12	Batuk berkahak	☐	☐	☐
13	Batuk selama lebih dari 2 minggu	☐	☐	☐
14	Demam yang berpanjangan	☐	☐	☐
15	Darah dalam kahak	☐	☐	☐
16	Kehilangan selera makan	☐	☐	☐
17	Berpeluh di waktu petang/malam	☐	☐	☐
18	Sakit bahagian dada	☐	☐	☐
19	Keletihan	☐	☐	☐
20	Turun berat badan	☐	☐	☐

	Langkah pencegahan penyakit Tibi adalah seperti berikut:			
21	Menutup mulut atau hidung jika batuk atau bersin	☐	☐	☐
22	Membuka tingkap rumah benarkan cahaya dan udara masuk	☐	☐	☐
23	Menjalani pemeriksaan segera jika ada tanda dan gejala Tibi	☐	☐	☐
24	Tidak meludah merata-rata	☐	☐	☐
25	Tinggal dalam bilik yang sesak	☐	☐	☐

Soalan-soalan berikut adalah sikap anda terhadap penyakit TB.
Sila tandakan pada kotak jawapan yang berkenaan.

B SIKAP TERHADAP PENYAKIT DAN PENGIDAP TB

		Amat tidak setuju	Tidak setuju	Tidak pasti	Setuju	Amat setuju
1	Sekiranya anda ada tanda dan gejala Tibi, anda akan segera menjalani ujian mengesahkan penyakit Tibi	☐	☐	☐	☐	☐
2	Anda tidak perlu menjalani ujian saringan Tibi jika terdapat ahli keluarga yang mengidap Tibi	☐	☐	☐	☐	☐
3	Sekiranya ada ahli keluarga anda yang mengidap Tibi, anda akan membantu dalam penjagaan rawatannya	☐	☐	☐	☐	☐
4	Pada pendapat anda, seorang perokok boleh merokok semula selepas tamat rawatan Tibi	☐	☐	☐	☐	☐
5	Pada pendapat anda, anda juga boleh dijangkiti Tibi jika ada ahli keluarga anda yang disahkan Tibi	☐	☐	☐	☐	☐

Soalan-soalan berikut adalah bagi menilai tahap amalan anda terhadap penyakit TB. Sila tandakan pada kotak jawapan yang berkenaan.

C	AMALAN TERHADAP PENCEGAHAN TB			
		Pada setiap masa	Kadang - kadang	Tidak pernah
1	Saya meludah merata-rata tempat di tempat awam	☐	☐	☐
2	Saya melakukan senaman ringan atau beriadah	☐	☐	☐
3	Saya menutup mulut atau hidung jika batuk	☐	☐	☐
4	Saya menutup mulut atau hidung jika bersin	☐	☐	☐
5	Saya pastikan cahaya matahari masuk ke dalam rumah	☐	☐	☐
6	Saya pergi ke klinik atau hospital jika ada batuk yang berpanjangan melebihi 2 minggu	☐	☐	☐

Soalan-soalan berikut adalah bagi menilai pandangan masyarakat terhadap penyakit TB.
Sila tandakan pada kotak jawapan yang berkenaan.

D PENILAIAN MASYARAKAT TERHADAP PESAKIT TIBI

		Amat tidak setuju	Tidak setuju	Tidak pasti	Setuju	Amat setuju
1	Sesetengah orang tidak suka untuk tinggal bersama pesakit Tibi	☐	☐	☐	☐	☐
2	Sesetengah orang menjarakkan kedudukan mereka dari pesakit Tibi	☐	☐	☐	☐	☐
3	Sesetengah orang berfikir bahawa pesakit Tibi menjijikkan	☐	☐	☐	☐	☐
4	Sesetengah orang merasa tidak selesa apabila berada dekat dengan pesakit Tibi	☐	☐	☐	☐	☐
5	Sesetengah orang tidak mahu pesakit Tibi bermain dengan anak-anak mereka	☐	☐	☐	☐	☐
6	Sesetengah orang tidak mahu bercakap dengan pesakit Tibi	☐	☐	☐	☐	☐
7	Sesetengah orang akan berkelakuan berbeza terhadap pesakit Tibi untuk sepanjang hidupnya	☐	☐	☐	☐	☐

		Amat tidak setuju	Tidak setuju	Tidak pasti	Setuju	Amat setuju
8	Sesetengah orang mungkin tidak mahu makan atau minum dengan orang yang berkawan dengan pesakit Tibi	☐	☐	☐	☐	☐
9	Sesetengah orang mengelak untuk menyentuh pesakit Tibi	☐	☐	☐	☐	☐
10	Sesetengah orang mungkin tidak mahu makan atau minum dengan saudara-mara pesakit Tibi	☐	☐	☐	☐	☐
11	Sesetengah orang takut kepada pesakitTibi	☐	☐	☐	☐	☐

5.2 APPENDIX B : TB education intervention programme

Time	Contents	Method/ Materials	Duration (minutes)
0830 - 0900	Opening ceremony	Speech from the school principal and investigator team	30
0900 - 0915	Pre-test assessment	KAPS Questionnaires	15-20
0915 - 0945	Education on TB epidemiology, mode of transmission, symptoms, TB prevention	TB lecture using multimedia	30
0945 - 1000		Question and answer session, Distribution of TB booklets	15
1000-1030	Refreshment		30
1030 - 1100	Education on TB epidemiology, mode of transmission, symptoms, TB prevention	Interactive quiz using multimedia	30
1100 - 1115	Divided students into groups Develop rapport	Ice-breaking session	10 -15
1115 - 1215	2 case scenarios to address positive attitudes toward TB and people with TB, preventive behaviours and TB stigma	Small group discussion (1 group consisted of 15-20 students facilitated by a doctor)	60
1230 - 1300	TB exhibition about TB epidemiology, mode of transmission, symptoms, TB prevention	TB Posters and chest radiograph exhibition	30
1300	Lunch		

Content of the materials

1. TB lecture and interactive quiz

2. Small Group Discussion – Case Scenario

SCENARIO 1

Anda mengalami batuk lebih dari 2 minggu, demam dan kurang selera makan. Ahli keluarga anda perasan anda semakin kurus. Apakah yang perlu anda lakukan?

Jawapan

1. Dapatkan pemeriksaan segera dari doktor di klinik atau hospital
2. Mengamalkan etika batuk yang baik – tutup mulut/ pakai topeng mulut/ jangan meludah merata-rata/ basuh tangan setelah menutup mulut

Apa pendapat anda tentang rawatan traditional? Amalan sihir/santau dan kaitan dengan TB?

Jawapan

1. Tidak ada sebarang kajian yang membuktikan rawatan traditional berkesan
2. Rawatan traditional tidak diketahui kesan sampingannya terhadap fungsi hati dan buah pinggang
3. Namun, rawatan daripada hospital oleh doktor-doktor terjamin dapat menyembuhkan penyakit TB
4. Amalan sihir dan santau banyak dikaitkan dengan tanda tanda penyakit TB seperti hilang selera makan, tidak bermaya, batuk berdarah dan menjadi semakin kurus. Perlu diingatkan jika mengalami simptoms tersebut, perlu pemeriksaan dari doktor bukan bomoh.

Setelah mendapat pemeriksaan doktor, anda didapati menghidap penyakit TB. Apakah yang perlu anda lakukan?

Jawapan:

1. Mula mengambil rawatan dengan betul. Rawatan penyakit TB perlu makan ubat setiap hari.
2. Mengamalkan etika batuk dan bersin serta meludah dengan betul – bincangkan etika batuk/bersin dengan betul.
3. Berhenti merokok jika anda adalah seorang perokok.
4. Nasihatkan ahli keluarga atau kontak TB yang lain untuk menjalani pemeriksaan di klinik atau hospital terdekat.

Jika anda seorang perokok, adakah anda boleh merokok kembali setelah tamat rawatan TB?

Jawapan:

1. Perokok lebih berisiko dijangkiti kuman TB.
2. Walaupun telah tamat rawatan TB, seseorang itu masih boleh dijangkiti sekali lagi dengan kuman TB dalam hidupnya.
3. Dinasihatkan agar berhenti selama-lamanya daripada merokok.

SCENARIO 2

Ahli keluarga anda (e.g. ayah/ibu) telah dijangkiti kuman TB. Sekarang dia masih dalam rawatan dan telah dibenarkan pulang ke rumah oleh doktor.

Pada pendapat anda, perlukah anda menjauhkan diri dengan ahli keluarga anda tersebut?

Jawapan:

1. Tidak perlu tetapi pada peringkat awal rawatan TB, pesakit perlulah memakai topeng muka dan menutup mulut ketika batuk.
2. Nasihatkan pesakit secara baik dan sopan.

Adakah anda merasa tidak selesa atau takut berada bersama/ berhampiran dengan ahli keluarga yang menghidap TB?

Jawapan:

1. Tidak perlu takut/merasa tidak selesa jika pesakit TB tersebut sedang/telah mendapat rawatan
2. Sokongan terhadap ahli keluarga sangat penting

Adakah anda akan makan dan minum bersama dengan mereka?

Jawapan:

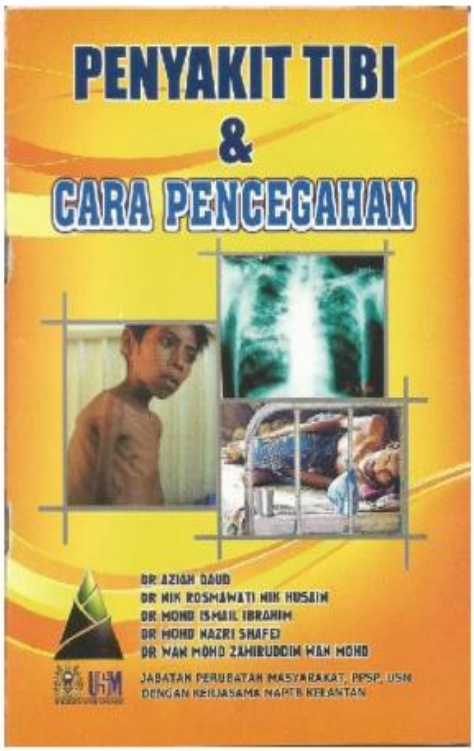
1. Penyakit TB tidak berjangkit melalui makan atau minum

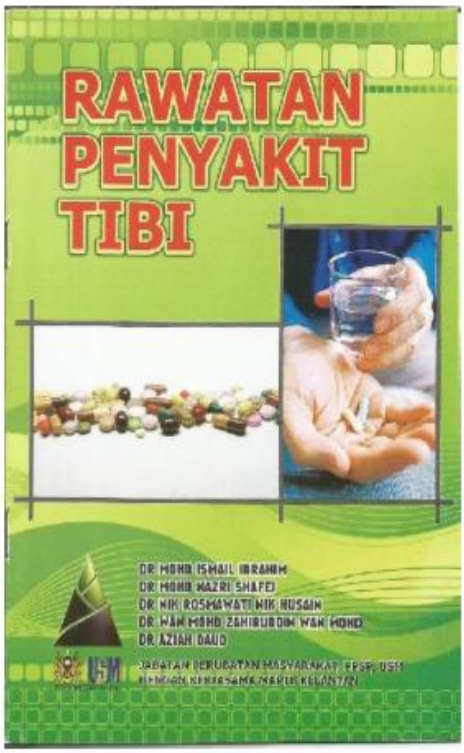
Bolehkah anda bersentuhan dengan pesakit TB?

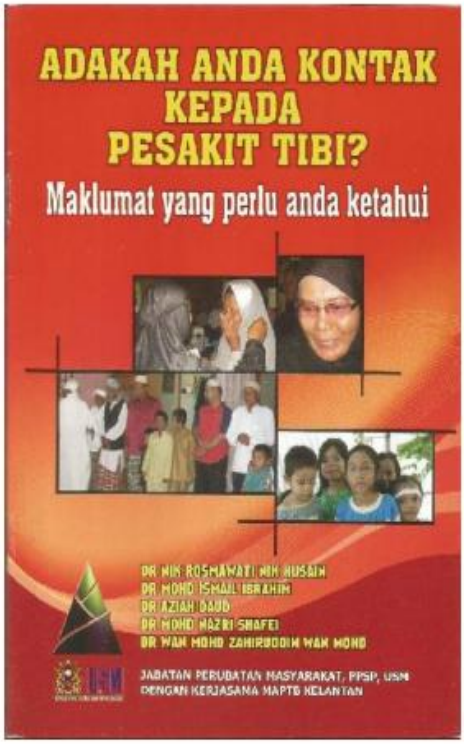
Jawapan:

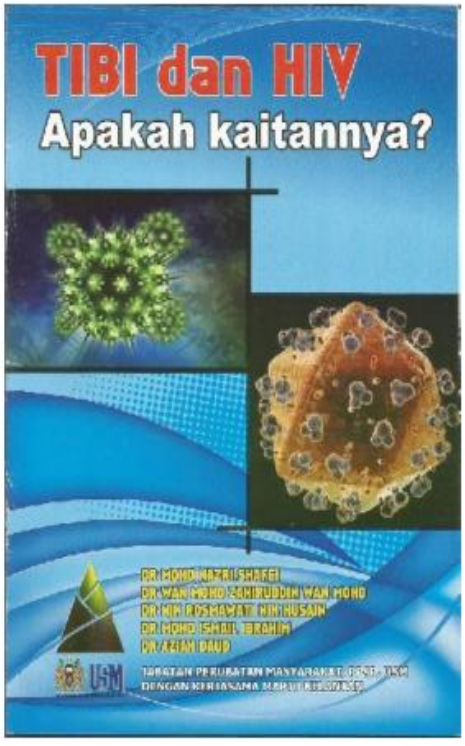
1. Ya kerana penyakit TB tidak berjangkit melalui sentuhan.

3.TB Booklets









5.3 APPENDIX C : Approval from Ministry Of Education

KEMENTERIAN PENDIDIKAN MALAYSIA
MINISTRY OF EDUCATION MALAYSIA
BAHAGIAN PERANCANGAN DAN PENYELIDIKAN DASAR PENDIDIKAN
EDUCATIONAL PLANNING AND RESEARCH DIVISION
ARAS 1-4, BLOK E8
KOMPLEKS KERAJAAN PARCEL E
PUSAT PENTADBIRAN KERAJAAN PERSEKUTUAN
62604 PUTRAJAYA

Telefon : 03-8884 6500
Faks : 03-8884 6439
Laman Web : www.moe.gov.my

KEMENTERIAN PENDIDIKAN MALAYSIA

Ruj. Kami : KPM.600-3/2/3 Jld ( )

Tarikh : 02 Mei 2017

Rosnani binti Zakaria
K.P.:740513036046

Jabatan Perubatan Keluarga
Pusat Pengajian Sains Perubatan
Universiti Sains Malaysia Kampus Kesihatan
16150 Kubang Kerian
Kelantan

Tuan,

KELULUSAN UNTUK MENJALANKAN KAJIAN DI SEKOLAH, INSTITUT PENDIDIKAN GURU, JABATAN PENDIDIKAN NEGERI DAN BAHAGIAN DI BAWAH KEMENTERIAN PENDIDIKAN MALAYSIA

Perkara di atas adalah dirujuk.

2. Sukacita dimaklumkan bahawa permohonan tuan untuk menjalankan kajian seperti di bawah telah diluluskan.

"The Effectiveness of TB Education Programme on Knowledge, Attitude, Practice and Stigma About Tuberculosis (TB) Among Secondary School Students in Kelantan"

3. Kelulusan ini adalah berdasarkan kepada kertas cadangan penyelidikan dan instrumen kajian yang dikemukakan oleh tuan kepada Bahagian ini. Walau bagaimanapun kelulusan ini bergantung kepada kebenaran Jabatan Pendidikan Negeri dan Pengetua / Guru Besar yang berkenaan.

4. Surat kelulusan ini sah digunakan bermula dari **01 Jun 2017 hingga 23 November 2017.**

5. Tuan juga mesti menyerahkan senaskhah laporan akhir kajian dalam bentuk *hardcopy* bersama salinan *softcopy* berformat Pdf di dalam CD kepada Bahagian ini. Tuan diingatkan supaya mendapat kebenaran terlebih dahulu daripada Bahagian ini sekiranya sebahagian atau sepenuhnya dapatan kajian tersebut hendak dibentangkan di mana-mana forum, seminar atau diumumkan kepada media massa.

Sekian untuk makluman dan tindakan tuan selanjutnya. Terima kasih.

"BERKHIDMAT UNTUK NEGARA"

Saya yang menurut perintah,

(DR ROSLI BIN ISMAIL)
Ketua Sektor
Sektor Penyelidikan dan Penilaian
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Bahagian Perancangan dan Penyelidikan Dasar Pendidikan
Kementerian Pendidikan Malaysia

QUALITY SYSTEM SIRIM STANDARDS
CERTIFIED TO ISO 9001:2008
CERT. NO: AR 3166

5.4 RAW DATA OF SPSS (CD SOFTCOPY)