KNOWLEDGE AND PERCEPTION AMONG BLOOD DONORS IN KELANTAN ON BLOOD SAFETY ISSUES

By

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TABLE OF CONTENT

DISCLAIMER

I declare that this dissertation records the results of the study performed by me and that it is of my own composition.

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ACKNOWLEDGEMENT

I would like to express my gratitude to my main supervisor, Dr. Nur Arzuar Abdul Rahim, for giving me the opportunity to work with him. I would not have crossed the finish line without his guidance, support and inspiration.

I would like to express my appreciation to my co-supervisor, Associate Prof Dr. Rosnah Bahar and Dr. Hafizuddin Mohamed Fauzi for their encouragement and support in conducting my research project.

Thank you to all the donors who participated in this research project, whose enthusiasm and active participation greatly facilitated the data collection.

Last, but not least, I would like to express my gratitude to my beloved family and friends for their prayers, love and support throughout the years. May God bless all of you.

LIST OF TABLES

LIST OF ABBREVIATIONS

HBV	Hepatitis B Virus
HCV	Hepatitis C Virus
HIV	Human Immunodeficiency Virus
ICC	Intraclass Correlation Coefficient
JEPeM	Jawatankuasa Etika Penyelidikan (Manusia)
KMO	Kaiser-Meyer-Olkin Measure of Sampling Adequacy
MJMHS	Malaysian Journal of Medicine and Health Sciences
MJMS	Malaysian Journal of Medical Sciences
MREC	Medical Research and Ethics Committee
PCA	Principal Component Analysis
SD	Standard Deviation
SPSS	Statistical Package for the Social Sciences
TTI	Transfusion Transmissible Infection
USA	United States of America
USM	Universiti Sains Malaysia
WHO	World Health Organization

LIST OF APPENDICES

ABSTRAK

PENGENALAN: Produk darah yang tidak selamat bagi transfusi darah kepada pesakit boleh menyebabkan jangkitan. Pengetahuan dan persepsi penderma darah pula, adalah penting kerana ia dikaitkan dengan tingkah laku penderma dan keselamatan produk darah. Setakat ini, tiada borang soal selidik yang disahkan untuk menilai pengetahuan dan persepsi mengenai isu keselamatan darah dalam kalangan penderma darah. Justeru, kajian ini bertujuan untuk mengesahkan borang soal selidik yang dibangunkan dan seterusnya menilai pengetahuan dan persepsi penderma darah terhadap isu keselamatan darah.

KAEDAH: Kajian ini dijalankan dalam dua fasa iaitu fasa pembangunan dan pengesahan soal selidik dan fasa kajian sebenar. Pada fasa pertama soal selidik dibangunkan oleh penyelidik dan pengesahan kandungan telah dilakukan melalui satu mesyuarat panel pakar dan dua penyemak kandungan. Soal selidik hanya terdapat dalam bahasa Melayu. Kaedah uji semula digunakan untuk membina konstruk dan konsistensi dalaman soal selidik. 130 penderma di Pusat Darah Negara telah direkrut untuk melengkapkan borang soal selidik yang dikendalikan sendiri ini. Kumpulan responden yang sama telah diuji semula selepas 2 minggu dengan menggunakan soal selidik yang sama. Selepas pengesahan soal selidik, kajian keratan rentas telah dijalankan di negeri Kelantan. Soal selidik ini terdiri daripada 39 soalan, termasuk demografi sosial, pengetahuan mengenai penyakit yang boleh merebak melalui transfusi dan prosedur penyaringan darah, pengetahuan tentang kelayakan penderma dan persepsi penderma terhadap keselamatan darah. Skor pengetahuan selanjutnya dikategori kepada baik dan lemah. Fasa 2 menggunakan persampelan rawak sistematik di mana setiap penderma darah kedua yang mendaftar akan direkrut dalam kajian. Soal

selidik mengambil masa 20 minit dan borang dikembalikan kepada penyelidik pada hari yang sama.

KEPUTUSAN: Konsistensi soal selidik telah dipaparkan melalui *intraclass correlation*. *Intraclass correlation* (ICC) untuk domain pengetahuan soal selidik ialah 0.895 (95% CI: 0.854-0.925). *Intraclass correlation* (ICC) untuk domain persepsi soal selidik ialah 0.891 (95% CI: 0.850-0.922). Analisis faktor menyokong penumpuan dan kesahihan diskriminasi soal selidik untuk semua item dalam kedua-dua domain. Daripada 450 soal selidik yang diedarkan, 389 telah dianalisis. 18.5% daripada penderma mempunyai pengetahuan yang baik manakala 81.5% mempunyai pengetahuan yang lemah. Kurang daripada 30% penderma menyedari bahawa individu yang sering bertukar pasangan seksual, biseksual dan lelaki homoseksual akan ditangguhkan secara kekal daripada pendermaan darah. Hanya 29.4% bersetuju bahawa penderma adalah bertanggungjawab jika darah mereka menyebabkan jangkitan. 39.3% penderma bersetuju bahawa mereka boleh memeriksa status penyakit HIV untuk diri sendiri melalui pendermaan darah. 10.3% dan 5.4% responden bersetuju bahawa penderma adalah bebas dari jangkitan jika mereka memakai kondom atau hanyamelakukan seks oral ketika terlibat dalam pelacuran.

KESIMPULAN: Borang soal selidik yang dibangunkan mempunyai konsistensi dan kesahihan yangmemuaskan . Penderma darah didapati mempunyai pengetahuan yang lemah dan persepsi yang salah mengenai isu keselamatan darah. Kementerian Kesihatan harus menerapkan pendidikan isu keselamatan darah yang betul dalam program kesedaran awam pada masa depan.

ABSTRACT

INTRODUCTION: Unsafe blood product may cause transfusion-transmissible infections. The knowledge and perception of blood donors is important as it is associated with their donation behaviour and the safety of blood products. There was no validated questionnaire that assess the knowledge and perception on blood safety issues among blood donors to date. This study aimed to validate the self-developed questionnaire and evaluate the knowledge and perception of blood donor on blood safety issues.

METHODS: This study was conducted in two phases, the questionnaire validation phase and the actual study phase. In phase one, the questionnaire was self-developed and the content validity was established through one expert panel meeting and two content reviewers. The questionnaire was available in only the Malay language. Test-retest method was used to establish the construct and internal consistency of the questionnaire. 130 donors in the National Blood Centre were recruited to complete the self-administered questionnaire. The same group of respondents were retested after 2 weeks using the same questionnaire. After the validation of the questionnaires, a cross-sectional study was conducted in the Kelantan state of Malaysia. The questionnaire comprised of 39 questions, including social demographic, knowledge of transfusion-transmitted disease and blood screening, knowledge on eligibility of donors and perception of donors towards blood safety. The knowledge score was further categorised into good and poor. During phase 2 of the study, systematic random sampling was used where every second blood donor enrolled was recruited in the study. The questionnaire took about 20 minutes to complete and was returned to the researcher on the same day.

RESULTS: The reliability of the questionnaire was displayed through intraclass correlation. The intraclass correlation (ICC) value of the test-retest for the knowledge domain of the questionnaire is 0.895 (95% CI: 0.854-0.925). The intraclass correlation (ICC) value of the test-retest for the perception domain of the questionnaire is 0.891 (95% CI: 0.850-0.922). The factor analysis supported the convergence and discriminant validity of the questionnaire for all item in both domains. Out of 450 distributed questionnaires, 389 were analysed. 18.5% of the donors had good knowledge while 81.5% poor. Less than 30% donors aware that people with frequent change of sexual partner, bisexual people and male homosexual people will be permanently deferred from blood donation. Only 29.4% agreed that donors are responsible if their blood causes infection. 39.3% of the respondents agreed that donors can check their HIV status via blood donation. 10.3% and 5.4% of the respondents agreed that donors are free from infection if they wear a condom or only had oral sex when involved in prostitution

CONCLUSION: The developed questionnaires have acceptable reliability and validity. Poor knowledge and notable misperception concerning safe blood issues was found among blood donors. The Ministry of Health should incorporate safe blood education in future public awareness programmes.

CHAPTER 1

INTRODUCTION

1.1 Overview

This chapter covers the brief introduction on blood safety, transfusion-transmittable diseases, blood screening, knowledge and perception among blood donors towards blood safety. This chapter also highlights the problem statements and objectives of the study.

1.2 Background of study

Blood safety is defined as the degree to which the blood supply for blood transfusion is free of harmful substances or infectious agents and properly typed and cross matched (Blood Grouping and Cross matching) to ensure serological compatibility between blood donors and recipients (ncbi.nlm.nih.gov, 2011).

Universal access of sufficient and safe blood and blood products for patients in need is the ultimate goal of blood transfusion services. As commonly known, blood product may pose risk to the receiver. Blood product is biological products which may carry transfusion-transmissible infections (TTIs). Hence, screening tests for some of these infections are implemented in order to reduce the occurrence of TTI. According to World Health Organization (WHO) guideline for screening of donated blood for TTI, it recommends the following routine laboratory tests for donated blood:

a) Human Immunodeficiency Virus (HIV) -1 and HIV -2: HIV antibodies or combination of HIV antigen-antibodies

b) Hepatitis B virus (HBV): Hepatitis B surface antigen

c) Hepatitis C virus (HCV): HCV antibodies or combination of HCV antigen-antibody

d) Syphilis: specific treponemal antibodies

(WHO, 2009a)

Screening tests for these 4 diseases have made the donated blood safer. However, there are still window period in which the screening tests unable to detect the target infection in the blood. Nucleic acid test for HIV, HBV and HCV has shortened the window periods for these infections. Still, unsafe blood products remain prevalent among the developing countries (Lin et al., 2014). An estimated of 5-15% of HIV infections in developing countries are caused by unsafe blood transfusion (WHO, 2009b). From the WHO Blood Safety and Availability Fact Sheet, prevalence of HIV in blood donation ranged from 0.08% to 0.20% in middle income countries, HBV ranged from 0.39% to 1.60%, HCV ranged from 0.21% to 0.40% while syphilis ranged from 0.31% to 0.58%. Thus, WHO recommends that selecting voluntary, non-remunerated donors for blood collection is an important step in reducing the risk of TTIs (WHO, 2007).

From a retrospective study done in National Blood Center from year 2004 to year 2008, it showed that there were increasing seroconversion rate for Syphilis, HIV and HCV in these 5 years' time. From this study, syphilis accounted for the highest and increasing seroconversion rate from 20.8% in year 2004 to 44.6% in year 2008. For HIV and HCV, it showed increasing conversion rate from 6.4% in year 2004 to 17.5% in year 2008 and 4.8% in year 2004 to 5.9% in year 2008 respectively (Nafishah et al., 2012). From an article regarding hepatitis status in Malaysia, it identified that transfusion was the top 3 main modes of HCV infection (3%) in Malaysia (Ruksana, 2016). In order to tackle these issues, blood donors' knowledge regarding blood safety

issues should be assessed and appropriate seminars or talks should be delivered to the blood donors.

Blood donors required to fill up the blood donor questionnaire before blood donation. By answering the questionnaire, it helps to exclude the subjects at high risks of transmitting blood-borne infectious pathogens from blood donation. For emerging disease such as Zika outbreak in Brazil in 2015, blood service team may screen donors by asking donors regarding travelling history to related countries and related clinical symptoms. This method is used when the screening test is not available for that particular infection (WHO, 2017b). However, blood donor questionnaire and counseling rely mainly on the co-operation of blood donors in providing the information related to their health status and risk of exposure to infections (Lin et al., 2014).

Not all the blood donors will disclose the deferrable risk behavior during donation. There was a study found out that 2.8% of the donated-donors reported to have deferrable behaviors in Hong Kong. From the same study, there were 10.2% of the donated donors possibly had deferrable behaviors but they did not disclose it prior to blood donation. The deferrable risk behaviors include ever had male-to-male sex, ever had sex with a HIV-positive partner, had ever been paid for sex, ever injected illicit drugs, had sex with bisexual male, had sex with sex worker, and sex with someone who abused or injected drugs (Wong et al., 2015).

Good perception is defined as correct interpretation and understanding of blood safety, while misperception is defined as incorrect interpretation and understanding of blood safety.

There were some misperceptions about blood safety that demonstrated by a study done in Serbia. This study found out that there were 6.2% of the blood donors strongly disagreed or disagreed with the statement that a blood donor needs to notify a transfusion service if they develop any illness during the 6 months after donating. 2.6% blood donors strongly disagree or disagreed the statement that they should not donate if they knew their blood was not safe for a recipient. Also, about 2.8% of the blood donors strongly disagreed and disagreed with the statement that truthful and accurate answers to the questions on donor questionnaire are essential for the safety of patients who receive that blood (Bogdanović et al., 2017). Another study done in United State showed that 2% of the respondents thought that transmission of HIV through blood transfusion was impossible. From the same study, 23% of the respondents responded that it was appropriate to donate blood in order to be tested for HIV while there were 12% of the respondents thought that it would be alright to donate blood after having engaged in an AIDS risk behavior (Sharma et al., 2001). From these studies we found that there were a lot of misperceptions on blood safety issues and proper actions must be taken to correct the misperceptions. However, there was lack of data in pertaining to these issues. Hence, this study is to find out the perceptions of the blood donors on blood safety so that proper actions can be taken later.

Some of the public even think that blood donation can contract diseases. In the study conducted in Lahore among the first year medical student, 62% of the

respondents thought that one can contract diseases while donating blood (Humayun et al., 2015). In certain studies, the population believed that blood donation can lead to HIV infection and hepatitis C and deterioration of health (Abdul 2008; Zaller et al., 2005). Thus, exploring the knowledge and perception of the blood donor is important for us to make recommendations, in order to improve their knowledge and perception.

The cost of unsafe blood is immeasurable. The economic costs of a failure to control the transmission of infection have already been graphically demonstrated in countries with a high incidence and prevalence of HIV and AIDS, which including higher of dependency and loss of productive labor as well as increased requirements for medical care. The morbidity and mortality from the transfusion of infected blood have affected not only the recipients, but also the family members and the communities (WHO, 2017a). WHO stated that research is urgently needed on the broader aspects of blood safety, including the effectiveness of blood safety strategies and behavioral risk factors among blood donors, particularly in developing countries (WHO, 2009b).

In this study, researchers are eager to know what is the level of the general population's knowledge on blood safety. The knowledge level on blood safety as well as voluntary blood donation is different among the developing countries. In Ethiopia, researchers found out about 38% of the residents in Birbir Town had adequate knowledge (Addisu et al., 2017). The knowledge level is higher compare to medical students in Imphal (33.1%) and Lahore (33.1%) (Sanayaima et al., 2012; Humayun et al., 2015). The possible explanation for it is the differences in the questions in the questionnaire for these studies and difference in the knowledge score that the authors

defined. Till date, there is limited study done among the blood donor in assessing their knowledge on blood safety in the South East Asia region.

There are associated factors with knowledge on blood safety and donation. In some studies, they found out that good or adequate knowledge was associated with educational status, occupation and household income (Addisu et al., 2017; Jemberu et al., 2016). Thus, this study needs to find out the associated factors with knowledge score among blood donor in Kelantan.

1.3 Problem statement

Up to the date there was no local study exploring blood donor knowledge and perception regarding blood safety. Even though there were studies done regarding blood safety and donation among blood donor, the majority of these studies were done in western and African settings. This study will be done to fill that research gap. This study will be giving background data regarding knowledge and perception of blood donor on blood safety issues. It is hoped that the study finding will help for further planning blood donation program intervention among public in future.

1.4 OBJECTIVES

1.4.1 General Objective

To assess the knowledge and perception of blood donor regarding blood safety

1.4.2 Specific Objectives

i. Development and validation of tools on assessing knowledge and perception on blood safety issues
ii. To determine the knowledge of blood donor on blood safety issues
iii. To determine blood donor perception on blood safety
iv. To identify associated factors and social-demographic with knowledge score of blood safety
v. To identify the association between knowledge with perception regarding blood safety

1.4.3 Alternative Hypotheses

There is not sufficient level of knowledge among blood donor regarding blood safety.

There is misperception among blood donor regarding blood safety.

There is a significant relationship between the associated factors of blood donor with knowledge score of blood safety.

There is a significant relationship between knowledge with perception of blood safety.

1.4.4 Null hypotheses

There is sufficient level of knowledge among blood donor regarding blood safety.

There is good perception among blood donor regarding blood safety.

There is no significant relationship between the associated factors of blood donor with knowledge score of blood safety.

There is no significant relationship between knowledge with perception of blood safety.

CHAPTER 2

STUDY PROTOCOL

TITLE OF PROPOSED RESEARCH

Knowledge and Perception among Blood Donors in Kelantan on Blood Safety Issues

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1.1 Introduction and Study Rationale (Research Background)

1.1.1 Introduction

Blood safety is defined as the degree to which the blood supply for blood transfusion is free of harmful substances or infectious agents and properly typed and cross matched (Blood Grouping and Cross matching) to ensure serological compatibility between blood donors and recipients (ncbi.nlm.nih.gov, 2011).

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Blood donors required to fill up the blood donor questionnaire before blood donation. By answering the questionnaire, it helps to exclude the subjects at high risks of transmitting blood-borne infectious pathogens from blood donation (WHO, 2012). For emerging disease such as Zika outbreak in Brazil in 2015, blood service team may

screen donors by asking donors regarding travelling history to related countries and related clinical symptoms. This method is used when the screening test is not available for that particular infection (WHO, 2017b). However, blood donor questionnaire and counseling rely mainly on the co-operation of blood donors in providing the information related to their health status and risk of exposure to infections (Lin et al., 2014).

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donate if they knew their blood was not safe for a recipient. Also, about 2.8% of the blood donors strongly disagreed and disagreed with the statement that truthful and accurate answers to the questions on donor questionnaire are essential for the safety of patients who receive that blood (Bogdanović et al., 2017). Another study done in United State showed that 2% of the respondents thought that transmission of HIV through blood transfusion was impossible. From the same study, 23% of the respondents responded that it was appropriate to donate blood in order to be tested for HIV while there were 12% of the respondents thought that it would be alright to donate blood after having engaged in an AIDS risk behavior (Sharma et al., 2001). From these studies we found that there were a lot of misperceptions on blood safety issues and proper actions must be taken to correct the misperceptions. However, there was lack of data in pertaining to these issues. Hence, this study is to find out the perceptions of the blood donors on blood safety so that proper actions can be taken later.

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In this study, researchers are eager to know what is the level of the general population's knowledge on blood safety. The knowledge level on blood safety as well as voluntary blood donation is different among the developing countries. In Ethiopia, researchers found out about 38% of the residents in Birbir Town had adequate knowledge (Addisu et al., 2017). The knowledge level is higher compare to medical students in Imphal (33.1%) and Lahore (33.1%) (Sanayaima et al., 2012; Humayun et al., 2015). The possible explanation for it is the differences in the questions in the questionnaire for these studies and difference in the knowledge score that the authors defined. Till date, there is limited study done among the blood donor in assessing their knowledge on blood safety in the South East Asia region.

There are associated factors with knowledge on blood safety and donation. In some studies, they found out that good or adequate knowledge was associated with educational status, occupation and household income (Addisu et al., 2017; Jemberu et al., 2016). Thus, this study needs to find out the associated factors with knowledge score among blood donor in Kelantan.

1.1.2 Justifications and benefits of the study

Up to the date there was no local study exploring blood donor knowledge and perception regarding blood safety. Even though there were studies done regarding blood safety and donation among blood donor, the majority of these studies were done in western and African settings. This study will be done to fill that research gap. This study will be giving background data regarding knowledge and perception of blood donor on blood safety issues. It is hoped that the study finding will help for further planning blood donation program intervention among public in future. Seminar can be given to the donors prior to blood donation to the targeted groups according to the findings from this study. With the knowledge regarding blood safety as well, donors can have self-deferral and reduce embarrassment of being deferred from blood donation. Also, it can help to reduce the time of donor counseling and more efficient blood donation process during the blood mobile.

1.2 Research questions and research hypothesis

1.2.1 Research Questions

- What is the level of knowledge among blood donor regarding blood safety?
- What are the perceptions of blood donor regarding blood safety?
- What is the relationship between the associated factors of blood donor with knowledge score of blood safety?
- What is the relationship between the knowledge score with perception on blood safety?

1.3 Objectives

1.3.1 General Objective

To assess the knowledge and perception of blood donor regarding blood safety

Specific Objectives

1. To determine the knowledge of blood donor on blood safety issues
2. To determine blood donor perception on blood safety
3. To identify associated factors and social-demographic with knowledge score of blood safety
4. To identify the association between knowledge with perception regarding blood safety

1.3.3 Research Hypothesis

1. **Null hypothesis:**

There is sufficient level of knowledge among blood donor regarding blood safety

Alternative hypothesis:

There is not sufficient level of knowledge among blood donor regarding blood safety

2. **Null hypothesis:**

There is good perception among blood donor regarding blood safety

Alternative hypothesis:

There is misperception among blood donor regarding blood safety

3. **Null hypothesis:**

There is no significant relationship between the associated factors of blood donor with knowledge score of blood safety

Alternative hypothesis:

There is a significant relationship between the associated factors of blood donor with knowledge score of blood safety

4. **Null hypothesis:**

There is no significant relationship between knowledge with perception of blood safety

Alternative hypothesis:

There is a significant relationship between knowledge with perception of blood safety

1.3.2 Literature Review

As generally known, blood donation can save life as well as harming the receiver. Blood safety is one of the main concerns in maintaining patient's safety during blood transfusion. Safe blood supply is critical in improving health care and in preventing transfusion-transmitted infections (TTIs). One of the reasons of TTIs is due to the blood is collected from the unsafe blood donors (Dhingra, 2002).

An estimated 5-15% of HIV infections in developing countries are caused by unsafe blood transfusions (WHO, 2009b). Research is needed in improving blood safety. From a study conducted among United States blood donors, there were only 60% of donors knew that the available screening tests may not detect a recent infection. Thirty seven percent blood donors from the similar study did not know or felt that it

was acceptable to donate blood to obtain HIV testing. The authors highlighted that further measurements were needed to increase donor understanding of the implications of risk behaviors and the limitations of current screening with regards to blood safety (Sharma et al., 2001).

Nucleic acid testing (NAT) is one of latest screening test for HIV, HBV and HCV as it shortens the window period. However, not all the centers could afford the cost for this screening test. Thus, the more practical way to improve transfusion safety is to improve the medical selection process of the blood donors and exclude the high risk blood donors (Tagny et al., 2011). The process of selecting donors might be challenging as not all donors will reveal the deferrable risk during donation. A questionnaire-study in Hong Kong showed that there was 1.7% of donors had history of sex with sex worker, 1.5% male donors had same-sex behaviors, 0.3% had sex with HIV-infected partners and 0.2% gave a history of drug injection (Wong et al., 2015). This study raised the importance of assessing the donors' perception and knowledge in order to improve blood safety.

Several factors were found to be associated with the knowledge level or awareness toward blood safety. In Serbia, a study found out that male donors, younger age group donors, those with lower educational level and first time donors had lowest awareness on blood safety (Bogdanović et al., 2017). Thus, this study aims to assess the knowledge and perception among first time donors and also their associated factors.

Kelantan is a state of Malaysia that is located at the North and bordered with Thailand. It is mainly resided by Malays and small proportion of Chinese, Indians and minimal Siameses. It is a multicultural state where the culture is influenced by Siam. There are intermarriages of local people with Siameses especially in the administrative

districts like Pasir Mas and Tumpat due to the geographical proximity to southern Thailand. Hence, it is valuable to explore the local scenario on blood safety issues in this multicultural state (Tan, Ngah & Darit, 2017).

Also, there are important health-related issues in this international border, including illegal drugs transportation as well as illegal prostitution (Wiwanitkit, 2017). The southern Thailand becomes a significant attraction for cross-border tourism such as shopping, sexual service and food. Prostitution is one of the most attracting parts which attract most of the Malaysian tourists to have 'night life" in this region. As discussed above, prostitution is one of the high risk behaviours and the donor should be deferred permanently if involved in this activity (Askew & Cohen, 2015).

From the Global AIDS Response Progress Report 2016 (Ministry of Health, 2016), it showed that Kelantan is one of the Top 5 highest prevalence with people living with HIV at end of year 2015 (10.3%). The other 4 states were Johor, Terengganu, Pahang and Selangor. These 5 states account for almost two thirds (62%) of all people living with HIV in Malaysia. Out of all the States in Malaysia, the prevalence of HIV patients who were intravenous drug user was highest in Kelantan (44.7%).

From a local study conducted in Kelantan, it showed the prevalence of HBV infection among blood donors was 1.1%. Also, it showed that male donor (1.2%) had higher prevalence of HBV infection compare to female donors (0.4%) (Yuosuf et al., 2007). From another study, it showed about 0.14% of HCV infection among blood donors in Northeastern Malaysia (Haslina et al., 2012). These two studies highlighted that improvement in knowledge and information on HBV and HCV infection are needed among the public to lower the incidence of TTI.

Dengue virus infection is a tropical disease causing morbidity and mortality. Transfusion transmitted dengue virus has been documented. A study did among blood donors in North Malaysia showed that about 4.2% of blood donors were seropositive of Dengue IgM while 2.8% were seropositive for both Dengue IgG and IgM (Yusoff et al., 2014). This showed a potential threat to blood safety. The test to detect dengue viral ribonucleic acid is expensive. Thus, self-disclosure is important by the donors. Knowledge regarding blood safety is important for the blood donors so that they can self-defer as well.

Thus, this study aims to assess the knowledge and perception among the blood donor and the associated factors with knowledge score. It is hoped that this study finding can help to improve the future blood donation education and program.

Methodology

1.4 Study Location

Hospital USM blood bank and Hospital USM blood donation mobile site in the Kelantan state

1.5 Study Design

Cross sectional study design. The respondents will be requested to answer a structured validated questionnaire.

1.6 Study Duration

The study will be conducted from June 2018 till May 2019.

1.7 Study Population

- Reference population: Blood donors at Kelantan

- Source population: Blood donors who come for blood donation at Hospital USM
- Target population: Blood donors who come for donation at blood bank Hospital USM or mobile blood drives Hospital USM
- Sampling frame: Registration for blood donors HUSM

1.8 Subject Criteria

All blood donors, male or female, eligible or temporary deferred for blood donation within the study period were eligible for the study. The respondents must be able to understand Malay language.

Exclusion criteria were:

- Illiterate donor
- Non Malaysian citizen
- Donor who had any known mental disorder.
- Medical personnel (nurses, doctors, health sciences students)

1.9 Calculation of Sample Size

Objective 1: *To determine the knowledge of blood donor on blood safety issues*

The current estimated sample size for this objective was based on 5 percent precision and 95% confidence level with infinite population, using single proportion calculation where 38.3% of the population had adequate knowledge (Addisu et al. 2017)

Single proportion: $n=(z/\Delta)^2 p(1-p)$

n = sample size

z = z statistic for a level of confidence = 1.96 (95% confidence interval)

p = true population proportion (in proportion of one; if 100%, p = 1)

Δ = absolute precision (in proportion of one; if 5%, Δ = 0.05)

$n = (1.96/0.05)^2\ 0.383(1-0.383)$

n = 363 + 10% non-response rate = 399

A minimum sample size of 399 is needed for this objective

Objective 2: *To determine blood donor perception on blood safety*

To the best of my knowledge there is lack of study regarding perception on blood safety among blood donor.

Sample size required for this objective will be calculated after pilot study.

Objective 3: To identify associated factors and socio-demographic with knowledge score of blood safety

Calculation using PS software for dichotomous outcome (having good knowledge and poor knowledge) (according to Jemberu et al. 2016) (using gender male versus female)

Power: 0.84

α: 0.05

P0: 0.268 (proportion of female having good knowledge)

M: 1

ψ : 1.89 (odds ratio of male)

Sample size= 175 x 2 = 350 + 10% non-response rate = 385

Objective 4: To identify the association between knowledge with perception regarding blood safety

To the best of knowledge there is lack of study regarding knowledge score with perception on blood safety among blood donor.

Sample size required for this objective will be calculated after pilot study.

Thus, the largest sample size is from Objective 1, n = **399**

1.10 Sampling Participant

Stage 1: Sampling method for validation of the Research tool will be using purposive sampling among the blood donor at National Blood Center, Kuala Lumpur that meet the inclusion and exclusion criteria. The questionnaire will be given to the respondents after the respondents completed blood donation.

Stage 2: Research will be conducted at Hospital USM blood bank or blood donation mobile by using systematic random sampling among the blood donor that meet the criteria. The questionnaire will be given to respondents after the respondents completed blood donation.

1.11Development of Questionnaires (Research Tool)

The questionnaire will be developed based on literature review and previous studies on knowledge and perception blood safety and donation among public donor. Prior to the development of the questionnaire, several meetings and a group discussion with all the supervisors will be conducted. The questionnaire will be later constructed after a formal group discussion with expert ***(Appendix C)***

In addition to experts opinion a random interview with public blood donor will be documented. The questionnaire will be then being content reviewed by Transfusion Medicine Specialist (Dr. Nor Hafizah Ahmad) as a transfusion medicine expert from National Blood Center, Kuala Lumpur.

The questionnaire will have a total of **26** questions. It was divided into three sections:

Section 1: Social demographic data

It will contained open ended and close ended question. The data included donor age, gender and marital status. The socio-economic background question included the household income, education level, occupation. These variables were identified in the literature as having possible predictive value for knowledge and perception of blood safety and donation.

Section 2: Knowledge of Blood safety and benefits of blood donation

This section consists of **15 items** using 3 scale answer "*True, False, Don`t know*". The item specifically focuses on knowledge of blood safety

Section 3: Perception regarding blood safety and donation

The third section consists of **5 items**. It had an open ended and close ended question and 3 Scale answer "*True, False, Don`t know*". The items focus on perception regarding blood safety