KNOWLEDGE AND PRACTICE OF BLOOD TRANSFUSION AMONG FINAL YEAR NURSING STUDENTS IN UNIVERSITI SAINS MALAYSIA (USM)

by

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Dissertation submitted in partial

fulfillment of the requirements for the

degree of Bachelor of Nursing (Honours)

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CERTIFICATE

This is to certify that the dissertation entitled "Knowledge and Practice of Blood Transfusion Among Final Year Nursing Students in Universiti Sains Malaysia (USM)" is the bona fide record of research work done by Ms. Nurul Ain Binti Mansor during the period of September 2019 to August 2020 under my supervision. I have read this dissertation and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation to be submitted in partial fulfillment for the degree of Bachelor of Nursing (Honours).

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DECLARATION

I hereby declare that this dissertation titled "Knowledge and Practice of Blood Transfusion Among Final Year Nursing Students in Universiti Sains Malaysia (USM)" is the result of my own investigations, excepts where otherwise stated and duly acknowledged. I also declare that it has not been previously or concurrently submitted as a whole for any other degrees at Universiti Sains Malaysia or other institutions. I grant Universiti Sains Malaysia the right to use the dissertation for teaching, research, and promotional purposes.

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LIST OF ABBREVIATIONS

ABO	-	Blood group system containing A, AB, B and O.
FFP	-	Fresh Frozen Plasma
HIV	-	Human Immunodeficiency Virus
HUSM	-	Hospital Universiti Sains Malaysia
INR	-	International Normalized Ratio
RBC	-	Red Blood Cell
SHOT	-	Serious Hazard of Blood Transfusion
TACO	-	Transfusion Associated Circulatory Overload
USM	-	Universiti Sains Malaysia
WHO	-	World Health Organization

KNOWLEDGE AND PRACTICE OF BLOOD TRANSFUSION AMONG FINAL YEAR NURSING STUDENTS IN UNIVERSITI SAINS MALAYSIA (USM)

ABSTRACT

Blood transfusion is a potentially hazardous procedure. Stringent procedures must be followed to ensure that the correct blood is given to the recipient. The aim of this study was to access the knowledge and practice on blood transfusion of final year nursing students which are diploma students and degree students in Universiti Sains Malaysia. A cross-sectional study was undertaken involving 66 participants via random sampling. A questionnaire survey was used for data collection from February 2020 to March 2020. Chi-square test was employed to examine the association between selected socio demographic characteristics and level of knowledge and practice of blood transfusion. The mean age of the respondent was 22.12 (1.13) years, with range between 21 years old up to 24 years old. The findings revealed that the majority of respondents, 66.7% of diploma students and 51.5% of degree students had moderate knowledge of blood transfusion. For practice, the findings revealed that the majority of respondents, 84.8% of diploma students and 97.0% of degree students had good practice of blood transfusion. A statistically significant association was observed between selected socio-demographic (programme) and level of knowledge ($p<0.156$) and with level of practice ($p<0.087$). It can be concluded that the nursing students is lack of knowledge on blood transfusion. The study emphasizes the need of knowledge and practice for performing the blood transfusion procedure.

PENGETAHUAN DAN AMALAN PEMINDAHAN DARAH DALAM KALANGAN PELAJAR KEJURURAWATAN TAHUN AKHIR DI UNIVERSITI SAINS MALAYSIA (USM)

ABSTRAK

Pemindahan darah adalah sebuah prosedur yang berpotensi dalam mendatangkan bahaya. Prosedur yang ketat mesti diikuti untuk memastikan darah yang digunakan untuk penerima adalah darah yang betul. Tujuan kajian ini adalah untuk mengetahui pengetahuan dan amalan para pelajar kejururawatan tahun akhir mengenai transfusi darah. Kajian keratan rentas dilakukan yang melibatkan 66 pelajar melalui pemilihan secara rawak. Soalan tinjauan telah digunakan untuk pengumpulan data dari Februari 2020 hingga Mac 2020. Ujian 'Chi-square' digunakan untuk memeriksa hubungan antara ciri-ciri sosio demografi yang terpilih dengan tahap pengetahuan dan juga tahap amalan pemindahan darah. Rata-rata umur responden adalah 22.12 (1.13) tahun, di mana mereka berumur antara 21 tahun hingg 24 tahun. Hasil kajian mendapati bahawa majoriti dari pelajar diploma, 66.7% dan 51.5% pelajar ijazah mempunyai tahap pengetahuan sederhana mengenai pemindahan darah. Untuk amalan, kajian menunjukkan majoriti pelajar diploma, 84.8% dan 97.0% pelajar ijazah mempunyai tahap amalan yang bagus dalam pemindahan darah. Perkaitan yang signifikan secara statistik dikaji antara sosio-demografi (program) dengan tahap pengetahuan ($p<0.156$) dan dengan tahap amalan ($p<0.087$). Dapat disimpulkan bahawa pelajar kejururawatan mempunyai kurang pengetahuan mengenai pemindahan darah. Kajian ini dapat menekankan tentang keperluan pengetahuan dan amalan untuk melakukan prosedur pemindahan darah.

CHAPTER 1

INTRODUCTION

1.1 Background of the study

Blood transfusion is a usual procedure in a hospital. It can be fatal if there is negligence because it is an invasive procedure. Every pint of blood received, always at least one percent of risks from the trasfusion. Acute hemolysis is the main cause of death (51% of death) due to transfusion. (56%) of most transfusion errors is happen in critical area (Yong et al., 2008)

Globally, the trend of blood transfusion is increasing, which has risen from 85 million units of transfusion in 2012 to 112.5 million of donations in 2016. (Sapkota, Poudel, Sedhain, & Khatiwada, 2018)

According to the National Heart, Lung and Blood Institute Trusted Sources, each year about 5 million Americans need a blood transfusion.(Stephen Carissa, RN, CCRN, & CPN, 2019)

The reason that a patient may undergo a blood transfusion are; most patients who have a major surgical procedure will have a blood transfusion to replace any blood loss during their surgery. Then, patients that need blood transfusion is a patients who have experienced serious injuries from car crushes or a victim of natural disasters. Individuals will often be the recepients of blood transfusions if they had an illness that causes anemia, such as leukemia or kidney disease (American Red Cross, n.d.)

In hospital, according to statistics, the majority of mistakes that occuring, include neglect in observation of recipients during transfusion, patient misidentification and

transfusion of wrong blood units (Freixo A et al., 2017). Inadequate training and lack of experience because of fewer blood transfusions activities in some hospital wards associated with error in blood transfusion procedure (Saillour-Glenisson F et al., 2002).

Nurses play an important role in safe blood transfusion procedure (Aslani Y et al. 2004). Nurses that lack of knowledge of blood and its products transfusion can lead to many complications in patients (Aslani et al., 2004). Therefore, the nurses should be aware of hazard and benefits of blood transfusion (Freixo A et al., 2017).

"There is an urgent need of training programmers in critical units to educate nurses on blood transfusion risks reduction, latest safety guidelines, nurse interventions and decision making". "Blood transfusion saves lives and improves health, but millions of patinets' need transfusions do not have time access to have safe blood" (WHO, 2008).

1.2 Problem Statement

Nurses are generally trained on the procedure of blood transfusion during their year of services. However, their level of knowledge varies from one another, as well as from different healthcare centres. Studies had been done by Saillour-Glenisson et al. (2002) and Hijji et al. (2010), which evaluated the knowledge of the nurses in blood transfusion at France and Arab.

According to Serious Hazards of Transfusion (SHOT) annual report 2014, majority of the incidents were caused by human error, and these make up 77.8% of total reports. Evidence also highlighted problems with nurses' transfusion practice and compliances to the recommendation (Bolton-Maggs, 2013)

Nursing students lack of clinical performance especially in blood transfusion. They also did not performing a blood transfusion procedure by using a proper way. One day, a nursing student will become a registered nurse. Therefore, all human errors in blood

transfusion procedures should be minimized to avoid any harm to the patient. In previous studies had shown that nurses make mistakes in performing the procedure. This study is importance to know the level of knowledge and practice of final year nursing students in Universiti Sains Malaysia, so that a change can be make regarding procedure of blood transfusion.

From previous study, there are limited study about blood transfusion and nursing students. Most of the previous study only focuses on nurses. Therefore, this study is important as a guide to know the level of knowledge and practice of nursing students.

1.3 Research Objective

1.3.1 General objective

To identify the level of knowledge and practice of blood transfusion among final year nursing students in USM.

1.3.2 Specific objective

1) To determine level of knowledge towards blood transfusion among final year nursing students in USM.
2) To determine level of practice towards blood transfusion among final year nursing students in USM.
3) To study the association between selected sosio demographic (programme) and level of knowledge towards blood transfusion among final year nursing students in USM.
4) To study the association between selected sosio demographic (programme) and level of practice towards blood transfusion among final year nursing students in USM.

1.4 Research question

1) What is the level of knowledge towards blood transfusion among final year nursing students in USM?
2) What is the level of practice towards blood transfusion among final year nursing students in USM?
3) Is there any association between selected sosio demographic (programme) and level of knowledge towards blood transfusion among final year nursing students in USM?
4) Is there any association between selected sosio demographic (programme) and level of practice towards blood transfusion among final year nursing students in USM?

1.5 Research Hypothesis

Hypothesis 1

H_o: There is no significant association between selected sosio demographic (programme) and level of knowledge towards blood transfusion among final year nursing students in USM.

H_A : There is a significant association between selected sosio demographic (programme) and level of knowledge towards blood transfusion among final year nursing students in USM.

Hypothesis 2

H_o : There is no significant association between selected sosio demographic (programme) and level of practice towards blood transfusion among final year nursing students in USM.

H_A : There is a significant association between selected sosio demographic (programme) and level of practice towards blood transfusion among final year nursing students in USM.

1.6 Conceptual & Operational Definition

Table 1.1

Conceptual and Operational Definition

	Keyword / Definition	Conceptual Definition	Operational Definition
1	Knowledge	Understanding of or information about a subject that you get by experience or study, either known by one person or by people generally. (Cambridge Dictionary, 2019)	Knowledge in this study is refers to understanding and information about blood transfusion.
2	Practice	The actual application or use of an idea, belief or method, as opposed to theories relating to it. (Oxford, 2019)	Practice in this study refers to actual application or method used by nursing students in performing blood transfusion procedure.
3	Blood Transfusion	The transfer of blood or blood components from one person (the donor) into the bloodstream of another person (the recipient). (William C. Shiel Jr, 2018)	Blood transfusion in this study refers to the procedure that being perform by the final year nursing students.

1.7 Significance of the study

The safety and effectiveness of the transfusion process are dependent on the knowledge and skill of nurses who perform the procedure. Poor practice may results in avoidance complications that may threaten patients' safety. Published work indicated that nurses' practice varied accross contexts and highlighted that patients received suboptimal care and incorrect transfusion in death or mobidity. The purpose of the study is to improve the knowledge and information of blood transfusion of final year nursing students, so that after this when they be a registered nurse, the error in blood transfusion procedure can be reduce. This study also is to know the weakness of the final year nursing students in blood transfusion procedure so that further intervention or action can be take. This study also aim to give useful information to the final year nursing students on blood transfusion procedure.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter reviewed the current literature related to knowledge and practice of blood transfusion. In addition, this chapter also provide a detail description on operational/ conceptual framework chosen for the proposed study.

2.2 Review of literature

2.2.1 Definition

Blood transfusion is a procedure in which whole blood or parts of blood are put into a patient's bloodstream through a vein. The blood may be donated by another person or it may have been taken from the patient and stored until needed. (CNI, 2019)

2.2.2 Type of Blood Transfusion

There are 4 types of blood products may be given through blood transfusion; red blood cells, platelets, plasma and cryoprecipitate (Sharma, Sharma, & Tyler, 2011).

2.2.2.1 Red Blood Cells

Packed red blood cells (RBCs) are prepared from the whole blood by removing approximately 250mL of plasma. One unit of packed RBCs should increase the level of hemoglobin by 1g per dL (10g per L) and increase the hematocrit by 3 percents. In most areas, packed RBC units was filtered to reduce leukocytes before storage. Transfusion of RBC are used to treat hemorrhage and to improve oxygen delivery to tissue (Sharma et al., 2011)

2.2.2.2 Plasma

Plasma is also known as Fresh Frozen Plasma (FFP). Plasma is a blood component made, when all the blood cells are removed from whole blood.The use of plasma is to replace missing or low levels of blood proteins. The colour of plasma is pale yellow liquid part of blood. Plasma will be stored frozen and thawed when needed (Australian Red Cross Blood Service, 2019) Plasma transfusion is recommended to patients with active bleeding and an International Normalized Ratio (INR) greater than 1.6. This plasma transfusion also recommended for patient that undergoing invasive procedure. Plasma transfusion will be given before the invasive procedure or surgery if a patient has been anticoagulated. Plasma is often appropriately transfused for correction of a high INR when there is no bleeding (Sharma et al., 2011)

2.2.2.3 Platelet

Platelet transfusion indicated to prevent hemorrhage in patients with thrombocytopenia or platelet function defect. Contraindications to platelet transfusion include thrombotic thrombocytopenic purpura and heparin induced thrombocytopenia. Transfusion of platelet in these conditions can be result in further thrombosis (Sharma et al., 2011) Platelet must be remain at room temperature (20-24 degree celcius) (University of Texas Medical Branch, 2019).

2.2.2.4 Cryoprecipitate

Cryoprecipitate was prepared by thawing the fresh frozen plasma and collecting the precipitate. Cryoprecipitate contains high concentrations of factor VIII and fibrinogen. Cryoprecipitate is used for the cases of hypofibrinogenemia. This cases most often occurs in the setting of massive hemorrhage or consumptive coagulapathy. (Sharma et al., 2011)

2.2.3 Phases of the transfusion process

2.2.3.1 Nurses role before blood transfusion

Before collecting a blood pack from blood bank, the patient should be ready to receive the transfusion. The preparation include an existing well-written medical order, an intravenous access was available, and any pre-medications or other solutions were entirely completed. Nurses should provide adequate information to the patients about the impending transfusion and make sure to answered patient's question. The information should focus on the indication for blood transfusion, it risks and benefits. Beside that, example of reaction symptoms also should be informed to the patients. Finally, baseline which is vital signs should be recorded within 30 minutes prior to the initiation of transfusion. (Hijji, Oweis, & Dabbour, 2012)

Withdrawal of blood from the blood bank was identified as a major source of error in the transfusion of the incorrect blood resulting from the collection of incorrect units. In order to prevent this error, the person that collecting the blood must ensure that a patient's identification details are identical on the collection slip, blood bag and the compatibility report form. Beside that, the blood or blood component unit identification details must be identical on the blood compatibility report form and the compatibility label attached to the unit.

Patients who are RhD positive can receive RhD negative products if the collected blood is compatible with theirs. Therefore, the nurses should be aware of the ABO group system. The blood bags should be transported from blood bank to the clinical area using a special blood transfusion box.

After the unit of blood arrived to the clinical area, the nurses should properly identify, at bedside, the patient intended for transfusion. This is critical procedure where failure to perform is the most frequent error leading to incorrect transfusion. Subsequently, the transfusion should commence as soon as possible, this is to avoid the risk of bacterial proliferation. As clinically indicated, the blood can be warmed by using only a well-maintained electronic warmer. Finally, the nurses should use a set of appropriate filter to administer the blood. The filter size (170-200 micron) was used and can be changed at least every 12 hours according to the latest authoritiative guidelines. (Hijji et al., 2012)

2.2.3.2 Nurses role during blood transfusion

Upon commencing a transfuion, nurses are required to infuse blood slowly during the first 15 minutes because most severe reactions occur during this period and the severity of a reaction is propoportional to the amount of blood infused. A rate of 2 ml/ min means the infusion is slow. Slow transfusion in indicated for patients with severe chronic anaemia, elderly and patients with heart disease.

At this phase, nurses should visually observe the patient for the first 10-15 minutes. The vital signs (body temperature, cardiac rate, respiratory rate and blood pressure) also should be recorded. This vital signs must be taken at the first 5 to 10 minutes, 30 minutes and subsequent hours and after ending of transfusion.(Hijji et al., 2012)

2.2.3.3 Nurses role after blood transfusion

Maximum of four hours, each transfusion should be completed after its initition. Normal saline and morphine 1.0 mg/ml could be safely co-administered with blood. Others drugs and intravenous solutions should not be co-administered with blood. Nurses play a role to assess the sign and symptomss of acute haemolytic transfusion reaction and

be able to intervene properly if any of these is noted. Finally, the presence of an urticarial rash is indictive of mild allergic transfusion.If the patient was suspected to develop allergic either moderate or severe symptoms, transfusion must be stopped and investigation of adverse transfusion reaction must be initiated by clinicians. Then, blood and urine samples should be collected according to hospital protocols. The blood and urine samples will be sent to the transfusion medicine laboratory for testing together with a filled transfusion reaction report form.

If the transfusion was completed without any adverse symptoms, the nurse should take a last measure which is patient's vital signs. After completion of transfusion procedure, the nurse should recorded the total volume transfused and the blood tag attached must be duly filled up. Then, the empty blood bag and the filled blood tag must be sent back to to hospital blood bank without much delay. The nurse should brief the patients to watch out for acute or delayed transfusion reactions that occurs within 24 hours of post transfusion. (Hijji et al., 2012)

2.2.4 Risk associated with Blood Transfusion

2.2.4.1 Hepatitis

Hepatitis is the most common transfusion-transmitted infection. All blood components and most blood products can transmit hepatitis except albumin. There is approximately 1 in 103,000 transfusion that have a risk of acquiring hepatitis C (AMN Healthcare Education Services, 2015).

2.2.4.2 Human Immunodeficiency Virus (HIV)

One of the risk associated with blood transfusion is human immunodeficiency virus (HIV). Risk of acquiring HIV from blood product is approximately 1 in 493,000 transfusions. Eventhough the cases of HIV related to transfusion is less than 20 cases per

year, this virus remains as one of the most feared transfusion-transmitted infections for patients.(AMN Healthcare Education Services, 2015)

2.2.5 Knowledge and Practice of blood transfusion

2.2.5.1 Knowledge of blood transfusion

The American Society of Registered Nurses (2008) concluded that there was an urgent need of training to educate nurses. It emphasize to educate on blood transfusion risks, the most recent safety guidelines, nurses intervention and decision making. It is also stated that nurses' knowledge and practice should be regularly checked (Yesilbalkan, 2019)

In the literature, it is emphasized that nurses should have an adequate knowledge of blood transfusion. Nurses also should be knowledgable about safe transfusion practices and clinical procedures(Yesilbalkan, 2019).

In few studies, the nurses being revealed by having a poor knowledge and low experience of safe blood transfusion in every step. (Yesilbalkan, 2019).

Saillour-Glenisson et al. (2002) surveyed a sample of 1090 nurses in 19 public hospitals in one French region. The survey is on their knowledge and practice of blood transfusion. Poor knowledge was reported in several areas including pretransfusion compatibility test, delay in admenistering blood and recognition of abnormal reactions after blood transfusion. (Encan & Akin, 2019)

In one study of the knowledge and practice of blood transfusion in Turkey, a sample of 100 nurses concluded that the nurses' knowledge was poor (only a few had scores over 50 of a total score of 100). The authors identified several aspects where nurses' knowledge was deficient, such as explaining the complications of blood transfusion,

physical observation on initiating a transfusion and vital signs recording after initiating a transfusion. (Encan & Akin, 2019)

2.2.5.2 Practice of blood transfusion

In Serious Hazard of Blood Transfusion (SHOT), a total of 3,288 cases were reported in the year 2015. 77.7% of the total SHOT cases were an errors resulted from mistakes or "human factors", and only 10% were not preventable (mostly allergic/febrile reactions). The number of cases with major morbidity was 166 and the total deaths reported were 26. The complications such as hemolytic transfusion reactions, transfusion associated circulatory overload (TACO), ABO incompatible transfusion and trnsfusion of incorrect blood product occured becuse of the errors in tools and guidelines used in previous studies and nursing standard of blood transfusion practices. (Sapkota et al., 2018)

In UK, several audits had also highlighted serious deficiencies in blood transfusion practice including checking the identity of those receiving the blood transfusion and monitoring their vital signs (Encan & Akin, 2019)

According to SHOT in 2011, half of all events related to errors was in the basic transfusion process such as incorrect patient identification. They also highlighted problems with nurses' transfusion practice and adherence to recommendations. (Smith, Gray, Atherton, Pirie, & Jepson, 2014).

2.3 Theoretical/Conceptual framework of the Study

This study used Theory of Planned Behavior by Ajzen (1991). This theory assumed that the best prediction of behavior is given by asking people if they are intending to behave in a certain way.

According to Theory of Planned Behavior, there are three determinants explain behavioural intention :

1. The attitude
2. The subjective norm
3. The perceived behavioural control

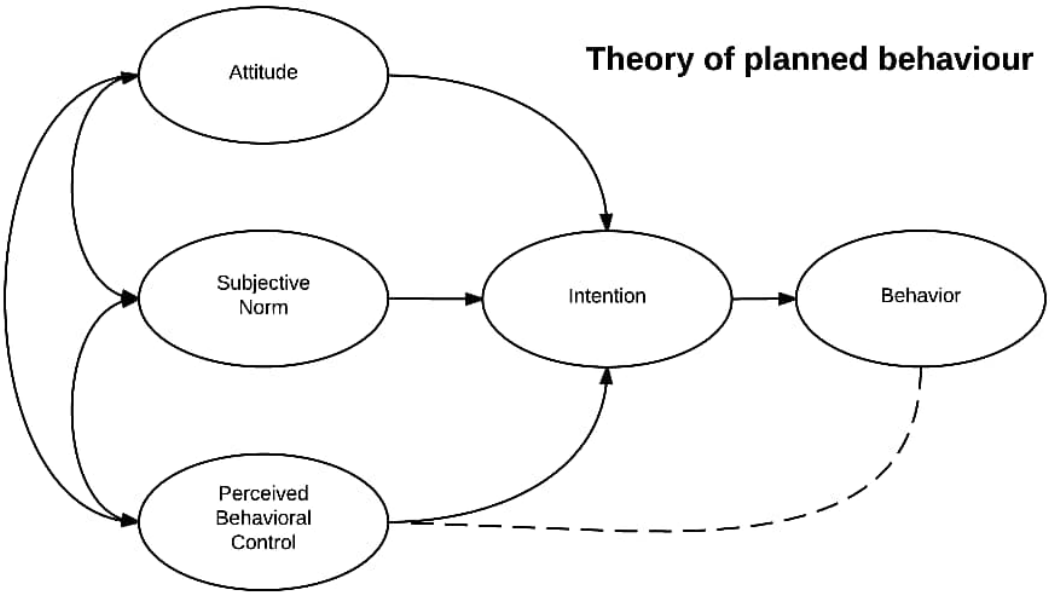

Figure 2.1 Theory of Planned Behavioral (Icek Ajzen, 2012)

According to Icek Ajzen, attitude to the behaviour refer to the degree to which a person has a positive or negative feelings of the behaviour of interest. Then, the subjective norms refer to the belief about it is significant for he or she to perform the behaviour. Perceived behavioural control refers to the individual's perception of the extent to which performance of the behaviour is easy or difficult. It increases when the individuals perceive they have more resources and confidence.

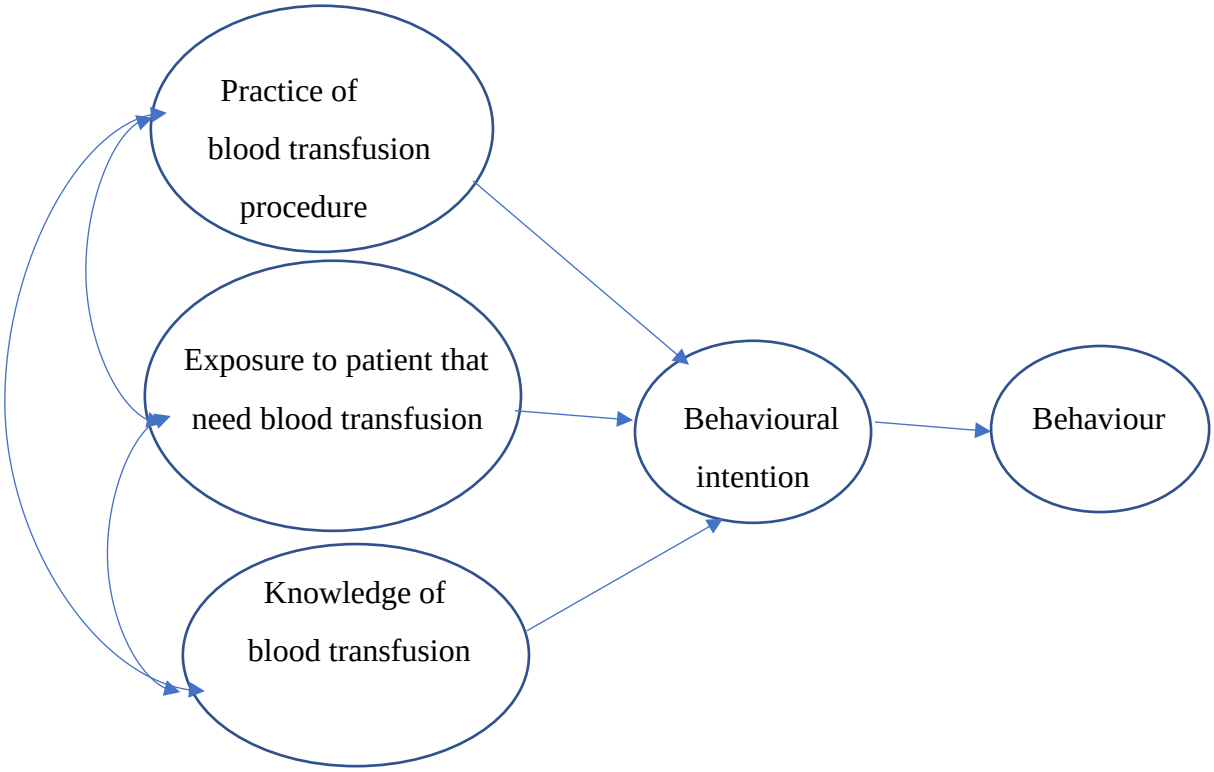

Figure 2.2 The adapted version of Theory of Planned Behaviour

For this study, attitude towards the behaviour refers to the practice of final year nursing students in USM regarding blood transfusion. Subjective norms in this study refers to the exposure to the patient who need blood transfusion procedure. Nursing students will have an experienced of being contact with patient that need a blood transfusion once the students done the blood transfusion procedure. Perceived behavioral control depends on the knowledge regarding blood transfusion. This can predict their behaviour either perform the procedure or not.

CHAPTER 3

METHODOLOGY

3.1 Introduction

In this chapter, the researcher described the methodology and methods used in conducting the study. This included the research design, sample selection, data collection and data analysis. In addition, the detailed ethical consideration also attached and listed here because it is a part of requirement to conduct this study.

3.2 Research Design

This study used a cross sectional study design to assess the level of knowledge and practice of blood transfusion among final year nursing students in Universiti Sains Malaysia . A cross sectional study design measures the outcome and the exposure in the study participants. The cross sectional study design begin the investigation at the single point in time and they continues the progress fowardly in term of direction of investigation in time until the proposed date in the near future.

3.3 Population and Setting

The target population in this study were among the diploma and degree final year nursing students of Universiti Sains Malaysia (USM) in health campus which already learned about the blood transfusion during the lecture and already exposed to the patients that need the procedure of blood transfusion in the ward.

3.4 Sampling Plan

3.4.1 Inclusion and Exclusion Criteria

Inclusion Criteria

- 4th year degree nursing students batch 2016/2017 and 3rd year diploma nursing students batch 2017/2018 who already exposed to the practicum in Hospital Universiti Sains Malaysia (HUSM).
- Nursing students who already learned about the blood transfusion procedure in lecture
- Able to understand English language
- Voluntarily to participate in this study

Exclusion Criteria

- Registered nurse students who already have working experiences and now pursuing study in degree nursing
- 1st, 2nd, 3rd year degree nursing students and 1st, 2nd year diploma nursing students

3.4.2 Sampling Method

The respondent were selected by using the probability of simple random sampling in lottery method. The researcher prepared the list name of the population subjects. Each member of the population had a known non-zero probability of being selected. All the population subjects were numbered based on list name on separate slip of paper. The slip of paper same in size, shape and colour before they were folded and mixed up in a box. Then, a blindfold selection were made. The number of slip were selected according to

desired sample size. The selection of population subjects depend on the chance. The chance of the subjects to be selected is equal. Through this lottery method, there were less probability of sampling bias. This can reflect a good representive of the population.

3.4.3 Sampling Size Estimation

There were total of 37 students for 4th year degree nursing and total of 33 students for 3rd year diploma nursing. In total, there were 70 nursing students that met the population sample size. The sample size estimation was calculated by using Raosoft Software. By using Raosoft Software, the sample size for this study was 60. By considering the probability of drop out, another 10% is added. Therefore, the total number of participants in this study are 66.

Sample size estimation = 60 + ((10/100 x 60)

= 60 + 6

= 66 participants

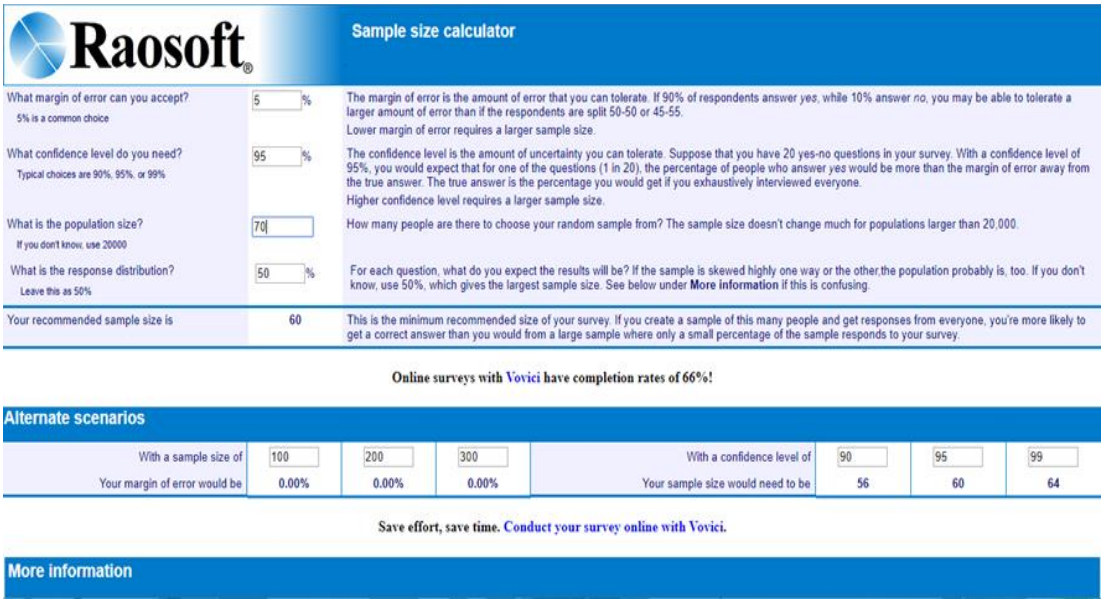

Figure 3.1 Sample size calculation by Raosoft.

3.5 Instrumentation

3.5.1 Instrument

The questionnaire used in this study was adapted and adopted from (Ddungu et al., 2018). The instrument generally consist 2 parts of questionnaire, Part 1 about the demographic data and Part 2 about knowledge and practice of blood transfusion.

The demographic data in part 1 consist of 6 different questions which were gender, age, race, programme, year of study and frequency of performing blood transfusion procedure.

For part 2, there are 2 sections of the questionnaire, which is section A and B. For section A, it consist of 10 questions about knowledge regarding blood transfusion using a dichotomous questions. For the section B, there is 7 questions regarding practice on blood transfusion. The type of question use here was likert scales.

3.5.2 Translation of Instrument

For this study, it does not required a translation of questionnaire to Malay Language. This is because all the sample can understand English Language.

3.5.3 Validity and Reliability

Validity of Instrument

Instrument's validity and realibility plays a major role in conducting this study. Validity refers to the degree to which an instrument accurately measures what it intends to measure (Yue Li, 2016). For these purpose, the questionnaire were validated by three content expert from nursing program to improve the content.

Reliability of Instrument

For this study, a pilot study being done to test the comprehension and reliability of the questionnaire. This is to make sure, the subjects can understand the questionnaire. The question had been modified to make sure the question is suitable for the subjects. The instrument was being answered by 10 peoples who met the inclusion criteria stated before.

3.6 Variables

The variables measured in this study can be divided into independent and dependent variables. The independent variables of this study was the programme. For the dependent variables of this study is the level of knowledge of blood transfusion and the level of practice of blood transfusion.

3.6.1 Variable Measurement

In this study, Part 1 of the questionnaire consists the independent variables which is socio-demographic characteristics. It is including gender, age, race, programme, year of study and frequency of performing blood transfusion procedure. For Part 2, it was divided into two sections which is Section A and Section B. Section A contain of 10 questions to test your knowledge of blood transfusion. Section B contain of 7 questions to test your practice regarding blood transfusion.

3.6.2 Variable Scoring

Knowledge on blood transfusion

There are 10 questions about knowledge of blood transfusion with the use of dichotomous question (close-ended question). 1 mark was given if the response answered the question correctly. No mark was given if the response answered wrongly and 'I don't know'. So, for knowledge domain, a knowledge score equal to the number of questions correctly answered out of 10. Then, the total point that the subject's get will classified them into a level of knowledge on blood transfusion either poor, moderate or good knowledge. The scoring method used in this study was based on the Bloom's cut off point.

Table 3.1

Scoring for Level of Knowledge on Blood Transfusion

Level of knowledge	Scores
Good knowledge (80-100%)	8-10
Moderate knowledge (60-79%)	6-7
Poor knowledge (less than 59%)	0-5

Practice on blood transfusion

There are 7 questions about practice of blood transfusion with the use of likert scale questionnaire. 2 score was given if the response was 'always'. 1 score was given if the response was 'sometimes' and no mark was given if the response was 'never'. So, for practice domain, a practice score equal to the number of questions correctly answered out of 14. Then, the total point that the subject's get will classified them into a level of practice

on blood transfusion either poor, moderate or good practice. The scoring method used in this study was based on the Bloom's cut off point.

Table 3.2

Scoring for Level of Practice on Blood Transfusion

Level of practice	Scores
Good practice (80-100%)	12-14
Moderate practice (60-79%)	9-11
Poor practice (less than 59%)	0-8

3.7 Ethical Consideration

Ethical approval had been approved by Human Research Ethical Committee (HREC). To conduct the study, the permission were being obtained from the Dean School of Health Science USM as the researcher use data about the name of the students final year nursing in USM. Permission to use the questionnaire in this study was already being obtained from the author.Verbal and written explanation about the purpose of the study had been given to each participants. The participants also was being informed that their participation was on the voluntary basis and they had their rights to discontinue the study. Before answering the questionnaire, written consent had been obtained from the participants. The participants also had been informed that the data collected will be kept confidential, anonymous and used for academic purpose only.

3.8 Data Collection Plan

3.8.1 Procedure of data collection

Data for this study being collected right after getting approval from the Human Research Ethical Committee (HREC) and permission from the Dean of School Health Sciences, USM. The respondents were choosen based on the inclusion and exclusion criteria. Before answering the questionnaire, the participants's written consent need to be fulfill. A brief being given to the participants regarding the instruction or guidance about the questionnaire that need to be completed also before answering the question. The questionnaire were then checked and examined from the respondents after they completed answering the questionnaire. Data collection being collected on February until March.

3.8.2 Flow Chart of Data Collection

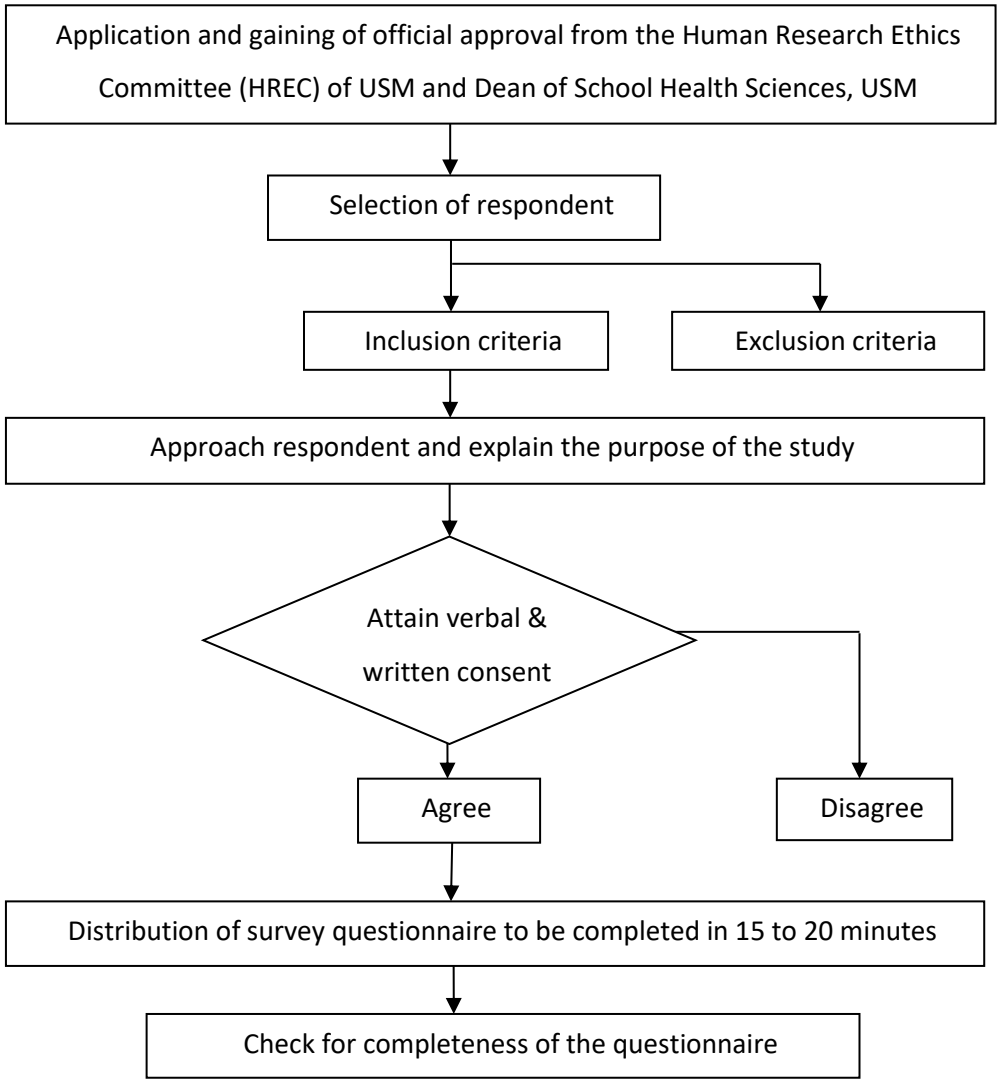

Figure 3.2 : Flow Chart of Data Collection