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Assessment of Selected University Students' Knowledge of Blood Donation and
the Relationship with Intent to Donate Blood

By:

Jeffrey T. Allerson

Thesis Submitted in Partial Fulfillment of the

Requirements for the Degree of

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In

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Minnesota State University, Mankato

Mankato, Minnesota

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Assessment of Selected University Students' Knowledge of Blood Donation and the Relationship with Intent to Donate Blood

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This thesis has been examined and approved by the following members of the thesis committee:

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Abstract

Assessment of Selected University Students' Knowledge of Blood Donation and the Relationship with Intent to Donate Blood

Allerson, Jeffrey T., *Minnesota State University, Mankato, MN, 2012. p.61*

The lack of blood donors in the United States is a problem. The purpose of this study was to examine the relationship between blood donation knowledge and blood donation intentions among students at Minnesota State University, Mankato (MNSU), and examine blood donation attitude and confidence levels among the respondents. A researcher-constructed electronic survey was sent to 3,944 MNSU students, with a total of 376 responses ($n = 364$; adjusted response rate = 9.23%).

Analyses included descriptive statistics, independent sample t-tests, frequency counts, and Pearson product-moment correlation coefficient tests. The mean intention scores of current blood donors were higher than non-blood donors. The respondents' mean knowledge score was moderately low (4.26), scoring just below the 50% mark on the knowledge assessment. The portion of respondents who had reported donating blood in the past was 56.5%. The blood donation attitudes among the respondents were reported as positive, with a mean attitudinal score of 6.48 out of 7. The confidence level of the respondents with respect to feeling capable of donating blood was moderately high, with a mean score of 5.30 out of 7. A significant relationship was identified between knowledge and blood donation intentions. A significant difference between men and women and their blood donation knowledge and attitudes was also identified. Finally, 60.6% of the respondents' preferred to receive blood donation educational materials through email services.

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Chapter One: Introduction

Saving lives could be the ultimate humanitarian gift. One way to save lives is through the process of donating blood. One blood donation (1 pint) can save up to three lives. Blood is made up of three different life saving components which include plasma, platelets, and red blood cells (Dailey, 2001). Blood cannot be manufactured; it can only come from generous donors.

The need for blood is tremendous in the United States. In fact, someone needs a blood transfusion every two seconds in the United States (American Red Cross [ARC], 2011b). Each year the demand for blood rises five to seven percent without a similar increase in blood donations (McCarthy, 2007). Reasons for this demand are associated with an aging population, increasingly complex surgeries, aggressive chemotherapy regimens, and a decline of eligible donors (Hannon, 2011). Currently, only 38% of all Americans are eligible to donate blood (ARC, 2011b).

This demand must be fulfilled by voluntary blood donations by eligible donors. In order to donate blood, a few donor barriers must be overcome. The prospective donor must overcome aspects of fear, lack of time, lack of monetary compensation, and eligibility. In addition, the donor should possess the proper knowledge required to make the decision to donate blood. In a recent study of 479 students at the University of California, it was found that the most common barriers for donating blood were inconvenience with time and blood center location (Yuan, Hoffman, Lu, Goldfinger, & Ziman, 2011). In two other previously completed studies, researchers found a variance in

regard to common blood donation barriers, but found time and convenience are among the top reported barriers to blood donation (Schreiber et al., 2009; Shaz et al., 2006).

Previous research has suggested that the donation behaviors of young adults are decreasing at an alarming rate compared to older populations in the United States. For both male and female donors ages 20-39, a greater than 40% decrease in numbers of repeat donors was observed from 1996 to 2005 (Zou, Musavi, Notari IV, & Fang, 2008). The reasons for this decline must be determined in order keep the blood supply well stocked for future life saving endeavors.

The process of getting young adults to donate is not easy. Two previous sets of researchers (Schreiber et al., 2009; Shaz et al., 2006) mentioned that prior interventions have been done to promote blood donation behaviors by means of increasing awareness, raising knowledge, and providing incentives for prospective donors (Schreiber et al., 2009; Shaz et al., 2006). Many of these strategies have proven to be successful, whereas others have failed. For that reason, additional studies need to be done concerning donors' intent to donate, and factors limiting their blood donating behaviors.

Statement of the Problem

Universities represent great resources for blood collection agencies. There is a large concentration of mostly young, healthy people, who can be easily accessed. Unfortunately, at most universities students do not tend to donate blood. As previously mentioned, in both male and female donors ages 20-39, a greater than 40% decrease in numbers of repeat donors was observed from 1996 to 2005 (Zou et al., 2008). In order to help reduce blood shortages, progress must be made to improve blood donation rates in college age individuals. This study will attempt to gain insight into whether knowledge

about blood donation can influence one's intent to donate blood. This is critical, because without knowing the factors that lead to the decline in donors among young adults, effective interventions cannot be completed.

Significance of the Problem

Understanding why young adults do not donate blood can help create effective promotional strategies intended to increase blood donation behaviors. This understanding may lead to more effective interventions to recruit blood donors, ultimately leading to the production of more blood units. Assessing the students at Minnesota State University, Mankato (MNSU) is important to help lead to this understanding. This study could prove to be of significance because if only one additional percent of all Americans would give blood, blood shortages would disappear for the foreseeable future (American Blood Centers, 2011a).

Targeting university students and learning about them can help to resolve the blood shortage. In the community of Mankato, MN where MNSU is located, individuals aged 15-29 make up 44.2 % of the total population (United States Census Bureau, 2010). Although not all of these individuals attend MNSU, the number of individuals who could be accessed is significant. If universities were studied and targeted all around America, the one percent increase in donors could be attainable. Assessing university students' knowledge in relation to blood donation is just one way to help appease blood shortages in the United States.

Purpose of the Study

The purpose of this study was to assess university students' knowledge of blood donation in relation to intent based upon a constructed survey instrument. Previous

researchers have focused on an individual's knowledge level based on education level and awareness about blood donation collection times or locations, but this study assessed knowledge directly related to the importance of blood donation. Exploring new potential blood donation barriers such as a lack of knowledge can eventually contribute to new educational interventions aimed at improving blood donation knowledge. Ultimately, this could help improve the number of blood donors, which would help appease the blood shortage in the United States. The study also assessed the university population to gain perspectives on blood donation intent levels related to gender, age, and different ethnicities. This study will provide a new perspective on assessing knowledge in relation to blood donation intent.

Research Questions

The following research questions were examined in this study:

1. What are the respondents' blood donation intent levels?
2. What do the respondents know about blood donation?
3. What are the respondents' current blood donation behaviors?
4. Do the respondents have a positive or negative perceived attitude about donating blood?
5. Do the respondents have high or low blood donation confidence?
6. What is the relationship between knowledge and intent level?
7. Do men and women differ in their blood donation intent levels, knowledge levels, attitudes, and levels of blood donation confidence?
8. What is the relationship between age and blood donation intent levels?

9. What are the respondents' preferred methods of receiving information regarding blood donation material?

Limitations

The limitations presented in this research include the following:

1. The results reflect knowledge and intent of MNSU students, and the results may not be generalized to other university populations.
2. The survey instrument was created only for this study, and has never been tested on other university populations.
3. Results were based on self-reported survey responses regarding blood donation behaviors and may reflect participant bias.
4. The sample size was limited by a convenience sample of participants by the Information Technology Systems at MNSU, as well as to the selected individuals who responded to the emailed survey.
5. A threat to external validity may be seen due to selection bias created from a convenience sample of MNSU students enrolled in at least one class for the 2011-2012 school years.

Delimitations

The delimitations presented in this research include the following:

1. The study was delimited only to MNSU students enrolled in at least one class for the 2011-2012 school year.
2. The study was delimited only to MNSU students who were 18 years of age or older.
3. The study was delimited by a short time frame for data collection, which ran from February 21st to February 28th, 2012.

Assumptions

The assumptions of this research include the following:

1. All of the participants were in fact MNSU students.
2. All of the participants could read and understand the survey.
3. All of the participants took the survey only once.
4. All of the participants were 18 years of age or older.
5. All of the participants took the knowledge assessment portion of the survey without using aids to find the correct answer.

Definition of Terms

For the use of this research a variety of terms were used. These particular terms are defined in the following section:

- Minnesota State University, Mankato (MNSU) Students: Participants must be enrolled in at least one class for the 2011-2012 school year.
- Intent Level: A measure of the extent to which an individual is motivated to give blood (Giles, McClenahan, Cairns, & Mallet, 2004).
- Knowledge Level: The participants' knowledge related to blood donation.
- Theory of Planned Behavior (TPB): A behavioral decision making model designed to account for behaviors that are not under an individual's complete volitional control. Its constructs include intention, attitude, subjective norms and self-efficacy (Masser, White, Hyde, & Terry, 2008).
- Barriers: Factors that can impede one's goals or a specified health behavior. In this study, barriers can inhibit one's blood donation activity. Specific barriers can

include time constraints, health concerns, lack of compensation, or a fear of needles.

- **Donor Eligibility:** In order to donate blood in the United States, donors must be 17 years of age (in most states), at least 110 pounds, and must be healthy. Also, individuals with HIV/AIDS and forms of Hepatitis are ineligible to donate (ARC, 2011c).
- **Blood Donation Knowledge:** Knowledge related to the direct need for blood in the United States, donor eligibility, the blood donation process, and factors influencing the blood supply in the United States.

Chapter Two: Review of Literature

Introduction

The purpose of this study was to assess selected university students' blood donation knowledge in relation to their intention to donate blood. The study aimed to answer questions about blood donation knowledge, intent, donation behaviors, and common blood donation barriers among college students. The main emphasis of the study was to relate blood donation intentions with blood donation knowledge using constructs from the Theory of Planned Behavior. This chapter examined the blood donation process, causes of blood shortages, common blood donation barriers, and the Theory of Planned behavior to help explain why there are blood shortages in the United States.

Blood Donation Process

The blood donation process is where the goals of health educators and blood collection facility managers merge. Efforts (such as promotion, education, and awareness) to increase blood donation behaviors all combine once a prospective donor enters a blood collection facility. It is important to acknowledge the history of blood donation and examine how the blood donation process works to help better understand why individuals do and do not donate blood.

Transfusion, defined as the transfer of blood from one individual to another, has been evolving for thousands of years throughout human history (Lefrère & Danic, 2009). The human fascination with blood dates back to 2,500 B.C. when Egyptians were drawing blood out of the body in attempt to cleanse the body of disease. In 500 B.C. the Ancient Greeks pioneered human dissection in order to understand how the blood flows

throughout the body (Educational Broadcasting Corporation [EBC], 2002). Although early practices related to blood donation seem barbaric, those early advancements paved the way for future blood transfusion experimentation (EBC, 2002).

Before the 17th century, attempts at transfusing blood were closer to legend or myth than applied therapy and treatment. In modern history, British physician William Harvey discovered how blood circulated throughout the body in 1628, and soon after, the first blood transfusion was attempted (Lefrère & Danic, 2009). In 1665 the first recorded successful blood transfusion occurred in England, where Physician Richard Lower kept a dog alive by transfusing blood from other dogs (ARC, 2011d). It wasn't until 1818 that British obstetrician James Blundell performed the first successful transfusion of human blood to a patient for the treatment of a postpartum hemorrhage (ARC, 2011d). These historical advancements helped formulate ideas for early 20th century blood donation innovators (ARC, 2011d).

The 1900's brought advancements such as blood typing, the establishment of a national blood collection agency, disease testing on collected blood units, and blood separation through plasmapheresis. In 1970 every United States blood bank switched to all volunteer donors (ARC, 2011d). These new advancements made donating blood and receiving blood transfusions much safer, increasing the tendency of people to voluntarily donate blood (Padman et al., 2010).

Today, the blood donation process relies heavily on technology related to blood testing due to the voluntary characteristic of blood donation. Each individual must be qualified in order to donate blood, which is the beginning of the blood donation process.

From start to finish, a prospective blood donor can expect to spend about an hour at the blood collection facility. However, the donor must be aware that the expected donation time can vary significantly among collection facilities. This variation in time stems from facility efficiency, organization, management, and availability of employees (Padman et al., 2010). The donor retention rate at a facility can largely depend on the blood donation process and its efficiency. This reason alone makes the blood donation process itself important. The more positive experience a donor has, the more likely he or she will come back and become a repeat donor (Padman et al., 2010).

The blood donation process has four basic phases. The first phase includes donor registration. During this time the blood collection facilities staff and volunteers will sign the donor in and go over basic eligibility and donor information. Educational material will then be given to the donor about the donation process, and the donor will be asked to show a valid form of identification (ARC, 2011c).

The second phase involves a medical history questionnaire and a mini-physical. The health history questionnaire helps determine donor eligibility and requires donors to reveal private health information, as well as places they have traveled. This is all done to ensure the integrity and safety of the blood being donated. The mini-physical will include a temperature check, pulse check, blood pressure check, and finally, a blood sample will be gathered to determine hemoglobin levels. These measures are all done to not only ensure the safety of the blood, but to ensure the safety of the donor (ARC, 2011c). The third phase involves the direct collection of the blood unit (1 pint). This is done if all the donor safety and eligibility requirements are met. A small sample of blood

is drawn first, and then one pint of blood is drawn over a time period of about 8-10 minutes. Once the blood is collected, the needle entry site is bandaged and the donor is sent onto the final stage of the blood donation process (ARC, 2011c).

The final stage involves a recovery period of about 10-15 minutes. This time allows the staff to observe any physical reactions the donor may have. The recovery stage also allows the donors to receive refreshments in order to rehydrate their bodies due to the fluid lost to the blood donation (ARC, 2011c). Knowing how the donation process works can help individuals understand what happens at a blood collection facility. The donors may feel more comfortable knowing what to expect, possibly positively increasing donor attitudes and future donating behaviors.

Cause of Blood Shortages

The factors that influence blood shortages are vast. They can range from donor ineligibility, negative attitudes towards blood donation, lack of education, lack of awareness, perceived behavioral barriers, and other monetary compensating donation opportunities (Schreiber et al., 2009; Shaz et al., 2006). It is important for researchers to understand these factors in order to better understand why blood shortages are occurring in the United States. Pointing out the causes can help identify evidence-based research solutions. In this section, literature was reviewed about donor eligibility, disease, and donation trends.

An eligible blood donor in the United States must be at least 17 years old to donate without parental consent, weigh a minimum of 110 pounds, and be in good general health. Phase one and two of the blood donation process is where most of the

eligibility requirements are determined. The safety of the blood and of the donors is critical for the future of blood donation (ARC, 2011a). Blood safety cannot be taken lightly, which is why rigorous and strict screening processes are in place.

Blood donors and blood transfusion recipients should know the processes that are followed in order to supply the United States with safe blood. Without proper knowledge, misconceptions can arise about the safety of blood donors as well as the blood units collected.

According to America's Blood Centers:

Only people who are not at risk for an infectious disease can give blood. Donors must answer a series of detailed questions about their health and risk for diseases that can be passed through the blood supply such as HIV and the hepatitis C virus. After completing the health questionnaire, donors take a mini-physical to make sure they are not anemic, have a fever or have high blood pressure. Each unit of donated blood goes through extensive testing to make sure it's safe for transfusion (America's Blood Centers, 2011b, para. 1).

The blood donation testing includes several nucleic acid tests that are Food and Drug Administration approved for screening donor blood in an effort to diminish the transmission of transfusion-related infectious diseases (Kraj & Nadder, 2007). Numerous manufacturers have developed standardized nucleic acid tests in order to detect diseases such as the human immunodeficiency virus type 1 (HIV-1), hepatitis C virus (HCV), hepatitis B virus (HBV) and the West Nile Virus (WNV). The nucleic acid test does a further examination of the blood collected to provide another protective barrier for the transfusion recipient. For example, after all the blood screening is done, the odds of someone contracting HIV from a blood transfusion are approximately 1: 1.5 million (Kraj & Nadder, 2007). The AIDS pandemic has prompted an increased alertness from government agencies, as well as blood banks about the United States blood supply safety

(Kraj & Nadder, 2007). The heightened alertness is not only directed towards the AIDS pandemic, but to other infectious diseases as well. This promptness and commitment to safety can help influence diverse blood donor recruitment and safety, which is critical to the future of our nation's blood supply (ARC, 2011a).

Another cause of the blood shortage is simply a lack of donors. Of course eligibility and disease play a major role, but there are other significant trends leading to blood shortages. Currently, only approximately 38% of the United States population is eligible to donate, and only 5% actually do (ARC, 2011b). This trend is alarming, and needs to be reversed in a way that shows an increase in blood donors, rather than a decrease. Another contributing factor to the lack of blood is that the demand for blood rises five to seven percent per year without a similar increase in blood donations (McCarthy, 2007). At the same time, the number of eligible donors has been declining. The number of blood donations collected in the United States in 2006 was 16 million units of blood. The total number of patients who received blood transfusions in 2006 was 5 million patients. Although there are more total donations than blood transfusions annually, it must be stressed that the average blood transfusion is about three pints of blood, and advanced medical procedures can require up to 100 pints of blood (ARC, 2011b).

The number of blood donations from repeat donors ages 20 to 49 decreased from 49.1% in 1996, to 37.1% in 2005 (Zou et al., 2008). The number of individuals who keep donating is declining. The total number of individuals donating blood is dropping at an alarming rate, especially in the target population of young adults. For both male and female donors ages 20-39, a 40% decrease in numbers of repeat donors was observed

from 1996 to 2005 (Zou et al., 2008). Granted, the demographics of the United States show an increase in the older population, but a decrease in blood donors of 40% in young adults in nine years is significant (Siegel, 1993).

Solutions to this problem cannot be solved by looking at numbers alone. There must be a reason why young adults account for the smallest portion of donors. Aside from donor ineligibility and disease, there must be more factors contributing to the lack of donors. Previous research has helped identify barriers by studying young adults and university populations to conceptualize their perceived behavioral barriers hindering them from donating blood.

Barriers to Blood Donation

The review of literature suggests many behavioral barriers related to donating blood. The next section reviews previous studies to determine the reported leading blood donation barriers among young adults and university populations.

A study by Shaz and colleagues (2009) surveyed 364 African American university students about blood donation deterrents and motives. Of the 364 students surveyed, 89% reported they would be more likely to donate if it were more convenient. This study also assessed knowledge in relation to the need for blood in the United States. Of the 364 students surveyed, only 50% were aware of local or nationwide blood shortages. The study concluded that educational campaigns to increase knowledge regarding the safety of the blood donation process, and the ongoing needs of an adequate blood supply might be effective methods to increase blood donation (Shaz et al., 2009).

In a similar study by Yuan and colleagues (2011), researchers examined the importance of various motivating and deterring factors for blood donation, and indicated

how university students prefer to be contacted by blood centers. The researchers received responses from 479 university students who were ethnically diverse, and 79.1% were between 18 and 28 years of age (Yuan et al., 2011). Altruism (concern for others) was by far the most important motivating factor for donation. However, incentives were also rated as important as altruism by 72.2% of the respondents. Inconvenience due to time or location constraints was the most important deterrent for donating blood (Yuan et al., 2011). E-mailing was the most preferred contact method, and was chosen by 80.3% of those surveyed. The researchers concluded that blood centers should offer more on campus blood drives to reduce the inconvenience barrier and should contact students via e-mail (Yuan et al., 2011).

These two studies demonstrate that time and location inconveniences were the leading blood donation barriers for college students. The results of just three studies should not be generalized to the entire population, but the barrier consistencies should be noted. One of the studies focused on African Americans, while the other on an ethnically diverse sample. The next reviewed study examined the general population. This study was reviewed to see if there was a consistent blood donation barrier finding among the general population, not only among university students.

In a study by Schreiber and colleagues (2006), a 30-item self-administered questionnaire was completed by 1,705 first time and 2,437 repeat blood donors. Asian, Hispanic, black, and white first time, and repeat blood donors rated the importance of deterrents to blood donation in their decision to donate again. A categorical analysis of variance methods was used to compare the importance of deterrents between first time, and repeat donors (Schreiber et al., 2006). Not having a convenient place to donate was

most commonly cited as an important or very important reason for not returning by 32-42% of first time, and 26-43% of repeat respondents (Schreiber et al., 2006). The study concluded that inconvenience was a major barrier to donating blood. This suggested that mobile collections and increased blood bank hours of operation might help retain first time, and repeat blood donors (Schreiber et al., 2006).

Theory of Planned Behavior

The Theory of Planned Behavior, according to Masser and colleagues (2008) is:

An extension of Fishbein and Ajzen's Theory of Reasoned Action, the Theory of Planned Behavior (TPB) is a well known behavioral decision making model designed to account for behaviors that are not under an individual's complete volitional control. The TPB is based on the premise that intention is the most proximal determinant of behavior. Intention, in turn, is proposed to be influenced by attitude, subjective norm and perceived behavioral control. In addition to the indirect influence on behavior via intention, perceived behavioral control is proposed to have a direct effect on behavior for behaviors that cannot be performed at will (p. 5).

The TPB provided a blueprint for this study's survey instrument and guided its research questions. In this particular study, intention was proposed to be influenced by university students' blood donation knowledge, attitudes (positive or negative attitudes toward blood donation and barriers), and their perceived behavioral control (confidence in relation to feeling capable of donating blood). Previous research regarding the TPB explaining blood donation behaviors is reviewed in the following section.

Many social, psychological, and behavioral theories have attempted to predict blood donation behaviors. Of all existing theories, the TPB has been one of the most enduring theories in predicting blood donation behaviors (Masser et al., 2008). Intention is the most consistent predictor of behavior, with control factors often demonstrating a

direct role in behavioral prediction (Jalalian, Latiff, Hassan, Hanachi, & Othman, 2010).

A meta-analysis study of 19 compiled studies relating the TPB to blood donation revealed that intention was the most common predictor of behavior. Subjective norms and perceived behavioral control varied significantly among the studies when predicting blood donation behaviors. In over half of the 19 studies, the subjective norm intention link was non-significant. The ongoing challenge of understanding the psychology and behaviors of potential blood donors still exists for researchers (Masser et al., 2008). Using the TPB may ultimately help predict those behaviors and help target promotion, awareness, and educational strategies (Masser et al., 2008).

In another study by Veldhuizen and colleagues (2011), they applied the TPB constructs such as attitude, self-efficacy, and subjective norms to see which construct has the greatest affect on intention. It was found that a feeling of self-efficacy had the greatest affect on blood donors' intention levels. Essentially, the greater a person felt able to donate blood, the more they intended to donate. Based on this study, it was recommended that intervention strategies focus on increasing prospective blood donors' level of self-efficacy (Veldhuizen et al., 2011). Another study by Giles and colleagues (2004) supported Veldhuizen and colleagues' results when a hierarchical multiple regression analysis provided strong support for the role of self-efficacy as a major determinant of intention. It not only helped to explain some 73% of the variance, but it also made a greater contribution to the prediction of blood donation intention than the other main independent variables of the TPB model (Giles et al., 2004). This study recommended that intervention strategies focus on increasing prospective blood donors'

level of self-efficacy through modeling, instructing, and by increasing the efficiency and quality of blood banks (Giles et al., 2004).

Summary

The recruitment and retention of blood donors is of significant importance to blood collection facilities. Past and present research within the social and behavioral sciences can help design approaches to address these issues (Ferguson, France, Abraham, Ditto, & Sheeran, 2007). Intention is the best predictor of donor behavior in numerous studies and should continue to be looked upon as a useful tool in order to increase donor recruitment and retention (Ferguson et al., 2007). It is argued that the goal of producing successful interventions to recruit blood donors would be greatly advanced by integrating recent theoretical perspectives. These theoretical perspectives can aid to increase donor retention, recruitment, and attitudes (Ferguson et al., 2007).

Chapter Three: Methodology

Introduction

The purpose of this study was to assess university students' blood donation knowledge and the relationship it has with intention to donate blood. This was done to help determine if a lack of knowledge is a barrier associated with low blood donation intentions. This can eventually contribute to new educational interventions aimed at improving blood donation knowledge and help appease blood shortages.

A blood donation knowledge and attitude survey was used to gather university students' blood donation knowledge, demographics, intentions, confidence, and attitudes based on the Theory of Planned Behavior (TPB). This chapter summarizes the research design and research methodology. Subject selection and the choice for instrumentation are also explained. Descriptions of how the data were collected, processed, and analyzed complete the chapter.

Description of Research Design

A non-experimental, cross-sectional survey was used for this study in attempt to describe through numbers, percentages, and averages the characteristics of the target population, as well as to help describe blood donation behaviors (Cottrell & McKenzie, 2011). Data were gathered through an electronic survey of Minnesota State University, Mankato (MNSU) students' blood donation knowledge and attitudes. Before the survey was disseminated and the data were collected, permission was acquired from the MNSU Institutional Review Board (IRB) (see Appendix A). Informed consent from participants was obtained by allowing them to read the survey homepage. Completing the survey was

interpreted as their informed consent to participate, as well as the confirmation that the participant was 18 years of age or older.

The dependent variable in this research study was the respondents' intention to donate blood. This research study investigated numerous independent variables in order to see changes within the dependent variable of intention. These independent variables included blood donation knowledge level, age, sex, and ethnicity. The data collected addressed the following research questions:

1. What are the respondents' blood donation intent levels?
2. What do the respondents know about blood donation?
3. What are the respondents' current blood donation behaviors?
4. Do the respondents have a positive or negative perceived attitude about donating blood?
5. Do the respondents have high or low blood donation confidence?
6. What is the relationship between knowledge and intent level?
7. Do men and women differ in their blood donation intent levels, knowledge levels, attitudes, and levels of blood donation confidence?
8. What is the relationship between age and blood donation intent levels?
9. What are the respondents' preferred methods of receiving information regarding blood donation material?

Selection of the Participants

The study sample was composed of MNSU students who were enrolled in at least one class for the 2011-2012 school year. In addition, to participate in this research study,

each participant had to be 18 years of age or older. If this criterion was not met, participation was prohibited.

Each participant was accessed and recruited by sending out survey participant requests by MNSU campus email. Each participant had access to informed consent material and information prior to completing the survey (see Appendix B). The survey contained a disclaimer stating that participants who completed the survey were assumed to be 18 years of age or older. The passive consent form also indicated that the survey was completely voluntary, no identification was needed, and there was minimal risk involved by participating in the research study.

Instrumentation

The instrument used in this research study was a researcher developed 32- item survey (see Appendix C). The survey was electronically distributed to the participants in the study. Fourteen of the questions were structured into statements by using a form of the Likert type scale. The participants answered the questions on a seven point scale to the degree in which they agreed or disagreed with each statement. These statements were used to gauge participants' blood donation confidence, attitudes, and intentions to donate blood. Five basic yes and no questions were also included to determine blood donation frequency, blood donation knowledge regarding blood type, eligibility, and perceived level of knowledge in regards to blood donation in the United States. Common demographic information was also gathered from the participants, including age, sex, and ethnicity. Nine questions of the survey were composed of multiple-choice questions used to assess participant knowledge directly related to the need for blood, qualifications of donors, motivation of donors, and a number of other factors.

Reliability and validity of the knowledge, attitudinal, confidence, and intention scales. To ensure the survey instrument contained content validity, accuracy, and essential information, it was reviewed by experts ($n = 5$) in the field of health, and by professionals within the American Red Cross organization. The review of experts was also utilized in order to help identify question relevancy and necessity. Each survey question was reviewed by the chosen experts and they categorized each question as necessary; useful, but not necessary; or not necessary, based on the purpose of the research study. Comments and suggestions were also made by the experts and the appropriate survey adjustments were made.

Cronbach's alpha analysis was used to evaluate each of the Likert scales constructed for the purposes of this research. This analysis evaluated the internal consistency of the constructed scales. Each scale was constructed by summing the scores of each of the items included in the scale and dividing that sum by the number of items within the scale. The results of the Cronbach's alpha analyses are presented with the mean scores and standard deviations for each type of scale in Table 1.

Table 1

Cronbach's Alpha Index of Internal Consistency (α), Mean Scores and Standard Deviations (SD) for the Blood Donation Attitude, Confidence, and Intention Scales

Scale	n of Items	M(SD)	α
Blood Donation Attitude	4	6.48(0.77)	.76
Barrier Attitude	2	1.31(1.31)	.86
Confidence	2	5.30(1.66)	.68
Current Blood Donor Intention	2	4.78(1.88)	.92
Non-Blood Donor Intention	2	3.11(1.74)	.90

Kuder-Richardson formula 20 (KR20) was used to evaluate the internal consistency of the knowledge scale. The scale was constructed by summing the scores of each item included in the scale and dividing that sum by the number of items within the scale. The results of the KR20 are presented with the mean score and standard deviation in Table 2. A KR20 test has a normal internal consistency score between 0.00 and .80, with longer exams receiving elevated scores. Caution should be made when making assumptions with respect to the knowledge scales in this study due to a low KR20 internal consistency score (see Table 2).

Table 2

Kuder-Richardson formula 20 of Internal Consistency, Mean Score and Standard Deviation (SD) for the Blood Donation Knowledge Scale

Scale	n of Items	M(SD)	α
Knowledge	9	4.26(1.44)	.12

Data Collection

The information gathered from MNSU students' about their blood donation knowledge and blood donation attitudes was collected using an electronic version of the survey. The electronic survey was formatted and administered through Zoomerang™. The survey was sent to 3, 944 randomly selected students by the Information Technology Systems at Minnesota State University, Mankato. The randomly selected students were sent the survey via email and asked to complete it voluntarily.

The survey was administered on February 21st, 2012, and was closed on February 28th, 2012. A reminder email was sent out on February 26th, 2012 to remind each participant of the closing date of the survey. The survey yielded 376 responses, which formulated a 9.53% response rate. After the data were cleaned and compiled, the survey yielded 364 responses, which formulated a 9.23% adjusted response rate. Krejcie and Morgan's (1970) formula for determining representativeness of a sample was used to determine whether the sample size for this study was representative of MNSU students. With 364 responses, a representative sample of MNSU was reached for this study.

Data Processing and Analysis

The collected data were entered into an SPSS spreadsheet for analysis. The research questions were examined and analyzed using the following statistical analyses.

Research Question 1: What are the respondents' blood donation intent levels? To answer this question the blood donation intentions of current blood donors and future blood donors were examined using descriptive statistics. Two scales comprised of two items were used to describe the respondents' blood donation intent levels.

Research Question 2: What do the respondents know about blood donation? To answer this question a knowledge score was generated from nine multiple-choice questions used to assess participant knowledge regarding blood donation information. Descriptive statistics were then used to examine the participants' knowledge level.

Research Question 3: What are the respondents' current blood donation behaviors? To answer this question information was gathered to determine blood donors and non-blood donors among the participants. Descriptive statistics were then used to examine the current blood donation numbers among MNSU students.

Research Question 4: Do the respondents have a positive or negative perceived attitude about donating blood? To answer this question the blood donation attitudes of the respondents were examined using descriptive statistics. One scale comprised of six items was used to describe the respondents' blood donation attitudinal levels.

Research Question 5: Do the respondents have high or low blood donation confidence? To answer this question the blood donation confidence levels of the

respondents were examined using descriptive statistics. One scale comprised of two items was used to describe the respondents' blood donation confidence levels.

Research Question 6: What is the relationship between knowledge and intent level? To answer this question the association between the participants' knowledge and blood donation intentions were examined. A Pearson product-moment correlation coefficient was used to determine the relationship between the participants' knowledge and intention.

Research Question 7: Do men and women differ in their blood donation intent levels, knowledge levels, attitudes, and levels of blood donation confidence? To answer this question the participants' blood donation intention, knowledge, attitudes, and confidence were compared based on the participants' gender. An independent sample t-test was used to find differences between male and female participants on each of the scales.

Research Question 8: What is the relationship between age and blood donation intent levels? To answer this question the association between the participants' age and blood donation intentions were examined. A Pearson's product-moment correlation coefficient was used to find a relationship between age and blood donation intention.

Research Question 9: What are the respondents' preferred methods of receiving information regarding blood donation material? To answer this question frequency counts were used to examine the participants' preferred outlets to receive information regarding blood donation educational material.

Summary

A non-experimental, cross-sectional survey was used to assess university students' blood donation knowledge and the relationship it has with intent to donate blood. After IRB approval was achieved, 3,944 emailed surveys were sent out to MNSU students. After a week of data collection, 376 survey responses were gathered. After the data was cleaned and compiled, 364 survey responses were used to analyze data. A detailed description of the study findings is provided in the following chapter.

Chapter 4: Results and Discussion

Introduction

The purpose of this study was to gain a better understanding of the relationship between blood donation knowledge and blood donation intentions among a sample of college students. A 32- item survey was developed and administered to collect data regarding MNSU students' blood donation knowledge, intention, attitude, confidence, and blood donation behaviors; as well as demographic information. Results from the quantitative analysis of each research question and procedural discussion is presented in this chapter.

Demographic Results

Data regarding the demographics of each study participant were collected. The demographic categories included gender, age, and ethnicity. The response rate for gender included 360 responses out of 364 (98.90%) possible responses. The response rate for age included 361 responses out of 364 (99.18%) possible responses. Finally, the response rate for ethnicity included 350 responses out of 364 (96.15%) possible responses.

Of the 360 individuals who responded to the gender survey category, 29.4% ($n = 106$) were male, 70.0% ($n = 252$) were female, and .6% ($n = 2$) were other. Of the 361 individuals who responded to the age survey category, the mean age of the respondents was 25 years ($SD = 8.55$), with a range of 18 to 65 years of age. Of the 350 individuals who responded to the ethnicity category, 92.3% ($n = 323$) were White/Caucasian, 1.4% ($n = 5$) were Black/African American, 1.4% ($n = 5$) were Spanish/Latino/Hispanic, and 4.7% ($n = 17$) were Asian/Pacific Islander (see Table 3).

Table 3

Demographic Characteristics of the Respondents

Characteristic	n	%	M(SD)
Gender	360		
Male	106	29.4	
Female	252	70.0	
Other	2	0.6	
Age	361		25.00(8.55)
Ethnicity	350		
White/Caucasian	323	92.3	
Black/African American	5	1.4	
Spanish/Latino/Hispanic	5	1.4	
Asian/Pacific Islander	17	4.9	

Research Questions and Results

The following section provides statistical analysis as well as data interpretation for each of the research questions presented in this study.

Research Question 1: What are the respondents' blood donation intent levels? Descriptive statistics were used to examine the respondents' blood donation intent levels. A seven point Likert scale was used to generate the level of blood donation intent among the respondents. The scale read as “strongly disagree”, “uncertain”, and “strongly agree” in relation to donating blood within the next 12 months. A score of seven indicated a high blood donation intent level, whereas a score of one indicated a low blood donation intent level. The mean intention score of past blood donors ($n = 203$) was found

to be a 4.69 (SD = 2.02). The mean intention score of non-blood donors ($n = 157$) was found to be 3.04 (SD = 1.80). Lastly, the likelihood of current and non-blood donors to donate blood within the next 12 months was 4.08 (SD = 2.06). The scores indicate that individuals who have donated in the past have a higher mean intention score than those who have not donated blood in the past (see Table 4).

Table 4

Blood Donation Intent Levels

Variable	n	M(SD)
Intent Level	350	
Current and Non-Blood Donors	350	4.08(2.06)
Current Blood Donors	203	4.69(2.02)
Non-Blood Donors	157	3.04(1.80)

Research Question 2: What do the respondents know about blood donation?

Descriptive statistics were used to examine the respondents' blood donation knowledge levels. A knowledge score was generated from the multiple-choice questions used to assess participant knowledge regarding blood donation information. A score of zero indicated no questions were answered correctly, whereas a score of nine indicated all questions were answered correctly. The respondents ($n = 357$) were found to have a mean knowledge score of 4.26 (SD = 1.44). All participants got a least one question correct. Furthermore, 2.5% ($n = 9$) of the respondents got one question correct, 7.6% ($n = 27$) got two questions correct, 20.4% ($n = 73$) got three questions correct, 26.3% ($n =$

94) got four questions correct, 24.9% ($n = 89$) got five questions correct, 11.8% ($n = 42$) got six questions correct, 4.8% ($n = 17$) got seven questions correct, and 1.7% ($n = 6$) got eight answers correct. No respondents answered all nine questions correctly (see Table 5). Caution should be made when making assumptions with respect to the knowledge scales in this study due to a low KR20 internal consistency score.

Data were also gathered to examine the respondents' knowledge based on knowing their own blood type, whether they knew if they are eligible to donate, and if they perceived themselves to have adequate knowledge regarding blood donation in the United States. The results show that 73.0% ($n = 257$) of the respondents knew if they were eligible to donate blood, whereas 12.2% ($n = 43$) did not and 14.8% ($n = 52$) were unsure. Data regarding the respondents' awareness of their own blood type show that 60.3% ($n = 213$) of the respondents did know their own blood type, whereas 39.7% ($n = 140$) did not know their own blood type. Finally, data regarding the respondents' perceptions on whether they have adequate knowledge regarding blood donation in the United States came to show that 66.2% ($n = 233$) felt they had enough knowledge, whereas 25.0% ($n = 88$) felt that they did not have enough knowledge regarding blood donation information, and 8.8% ($n = 31$) were unsure. These data indicate that increased knowledge regarding blood donation information is needed on the MNSU campus. In each case, a significant percentage of the respondents were unaware of many important factors that can increase the blood donation frequency and confidence (see Table 5).

Table 5

Blood Donation Knowledge Levels

Knowledge Scale	n	%	M(SD)
Knowledge	357		
Average Total Score			4.26(1.44)
Respondent Score Frequency			
Score of 0	0	0	
Score of 1	9	2.5	
Score of 2	27	7.6	
Score of 3	73	20.4	
Score of 4	94	26.3	
Score of 5	89	24.9	
Score of 6	42	11.8	
Score of 7	17	4.8	
Score of 8	6	1.7	
Score of 9	0	0	
Donation Eligibility	352		
Yes	257	73.0	
No	43	12.2	
Unsure	52	14.8	
Blood Type	353		
Yes	213	60.3	
No	140	39.7	
Adequate Knowledge	352		
Yes	233	66.2	
No	88	25.0	
Unsure	31	8.8	

Research Question 3: What are the respondents' current blood donation

behaviors? Descriptive statistics were used to examine the current blood donation behaviors among MNSU students. The results show that 56.5% ($n = 205$) of the respondents have donated blood in the past, whereas 43.0% ($n = 156$) of the respondents have not donated blood in the past. In relation to those that have donated blood in the past, 65.0% ($n = 132$) have continued to donate blood beyond the first initial time, and 34.0% ($n = 69$) have discontinued donating blood after the first time. The results indicate a problem within blood donor retention rates among the MNSU student population. The results also indicate a minor lack of donors among the MNSU student population (see Table 6).

Table 6

Blood Donation Behaviors

Characteristic	n	%
Respondents' Donor Status	363	
Current Blood Donors	205	56.5
Non-Blood Donors	156	43.0
Did Not Remember	2	0.6
Blood Donors	203	
Continued to Donate	132	65.0
Discontinued to Donate	69	34.0
Did Not Remember	2	1.0

Research Question 4: Do the respondents have a positive or negative perceived attitude about donating blood? Descriptive statistics were used to examine the respondents' perceived attitude about blood donation and barriers associated with blood donation. A seven point Likert scale was used to generate a positive or negative perceived attitude about blood donation among the respondents. The scale read as "strongly disagree", "uncertain", and "strongly agree" to attitudinal statements regarding blood donation and blood donation barriers. A score of seven indicated a positive attitude towards blood donation, whereas a score of one indicated a negative attitude towards blood donation. The mean attitudinal score of the respondents ($n = 344$) was 6.48 (SD = .77). The mean score of the respondents ($n = 342$) with respect to blood donation barriers was 1.31 (SD = 1.31). The numbers indicate a highly positive attitude toward blood donation and low perceptions of barriers to influence blood donation among MNSU students (see Table 7).

Table 7

Blood Donation Attitude Level

Variable	n	M(SD)
Attitude Level	344	6.48(0.77)
Barrier Attitude Level	342	1.31(1.31)

Research Question 5: Do the respondents have high or low blood donation confidence? Descriptive statistics were used to examine the respondents' confidence towards blood donation. A seven point Likert scale was used to generate a high or low

confidence score in relation to donating blood. The scale read as “strongly disagree”, “uncertain”, and “strongly agree” to confidence statements regarding blood donation. A score of seven indicated high confidence towards feeling capable of donating blood, whereas a score of one indicated low confidence towards feeling capable of donating blood. The mean confidence score among the respondents ($n = 345$) was 5.21 (SD = 1.66) (see Table 8). The mean score indicates that MNSU students feel moderately confident in regards to feeling capable of donating blood.

Table 8

Blood Donation Confidence Level

Variable	n	M(SD)
Confidence Level	345	5.30(1.66)

Research Question 6: What is the relationship between knowledge and intent level? Pearson product-moment correlation coefficient was used to determine if a statistically significant relationship existed between knowledge and intent level. It was found that the blood donation intentions of current blood donors’ increased as their blood donation knowledge increased, which showed a positive correlation between the two variables (see Table 9). However, caution should be noted due to a lack of internal consistency within the knowledge scale.

Table 9

Relationship between Knowledge and Blood Donation Intention: Pearson Product-Momentum Correlation Analyses

	Intention of Donors
Knowledge	.30*

* $p \leq .05$.

Research Question 7: Do men and women differ in their blood donation intent levels, knowledge levels, attitudes, and levels of blood donation confidence?

Independent sample t-tests were used to compare the means of blood donation intent (current and non-blood donors), knowledge, confidence, and attitudinal scores among male and female respondents. The difference between men and women and their intent to donate showed no statistical significance, regardless if they were blood donors or not (see Table 10). The difference between men and women and their knowledge scores was statistically significant ($t = -2.171, p < .05$) (see Table 9). Women scored an average of 4.37 (SD = 1.48), whereas men scored an average of 4.00 (SD = 1.37) (see Table 10). This indicated that women scored slightly higher on the knowledge assessment than men. However, caution should be made when making assumptions with respect to the knowledge scales in this study due to a low KR20 internal consistency score.

The difference between men and women and their attitudes towards blood donation was statistically significant ($t = -3.811, p < .01$) (see Table 10). Women had an

average score of 6.58 (SD = .63), whereas men had a score of 6.23 (SD = 1.02) (see Table 10). The difference between men and women and their attitudes about blood donation barriers was statistically significant ($t = -3.069, p < .01$) (see Table 10). Women had an average score of 1.17 (SD = 1.25), whereas men had a score of 1.65 (SD = 1.42) (see table 10). This indicated that women have a more positive attitude in association with blood donation and have lower perceptions of barriers to influence blood donation compared to men. There was no statistically significant difference between men and women and their blood donation confidence levels after the completion of the independent sample t-test (see Table 10).

Table 10

Independent Sample t-tests Comparing Mean Blood Donation Intent, Knowledge, Confidence, and Attitudinal Scores among Male and Female Respondents

Scale	Men M(SD)	Women M(SD)	t-value
Knowledge	4.00(1.37)	4.37(1.48)	-2.171*
Intent (Donors)	4.60(1.96)	4.86(1.85)	-.881
Intent (Non-Donors)	3.10(1.53)	3.12(1.82)	-.080
Attitude	6.23(1.02)	6.58(.66)	-3.811**
Attitude Barriers	1.65(1.42)	1.17(1.25)	-3.069**
Confidence	5.29(1.72)	5.31(1.63)	-.061

* $p < .05$. ** $p < .01$.

Research Question 8: What is the relationship between age and blood donation intent levels? There was found to be no statistically significant relationship

between the age of an individual and the level of blood donation intent. This was found by using Pearson's product-moment correlation coefficient to find a statistically significant relationship between age and blood donation intent among the respondents.

Research Question 9: What are the respondents' preferred methods of receiving information regarding blood donation material? Descriptive statistics were used to examine the respondents' preferred method to receive educational materials regarding blood donation. The majority of the respondents preferred receiving information through email 60.6% ($n = 211$), whereas 2.0% ($n = 7$) preferred the telephone, 10.9% ($n = 38$) preferred the mail, 17.2% ($n = 60$) preferred pamphlets, 4.9% ($n = 15$) preferred educational classes at MNSU, and 4.3% ($n = 15$) preferred other methods than those listed above (see Table 11). This indicated the best method to reach the MNSU population is through email.

Table 11

Respondents' Preferred Method to Receive Educational Materials Regarding Blood Donation Information

Method	n	%
Respondents	348	
Preferred Method Frequency		
Email	211	60.6
Telephone	7	2.0
Mail	38	10.9
Pamphlets	60	17.2
Education Classes at MNSU	17	4.9
Other	15	4.3

Discussion

This study focused on factors that can influence MNSU students' intentions to donate blood. Numerous results from this study reflect findings from previous research done on factors that can influence blood donation behaviors. While some of the results of this study reflect previous research, some of the results also differ.

This study found a lack of knowledge among the respondents' knowledge about blood donation in the United States. However, this assumption should be looked at with caution due to a lack of internal consistency within this study's knowledge scale.

Knowledge also lacked in the respondents' knowledge about their own blood type, blood donation eligibility status, and their perceptions of having adequate knowledge regarding

blood donation information in the United States (see Table 5). These findings are consistent with previous research and suggest that educational campaigns to increase knowledge regarding the safety of the blood donation process, and the ongoing needs for an adequate blood supply might be effective methods to increase blood donation (Shaz et al., 2009).

The preferred method for the respondents to receive educational materials about blood donation was found to be through email (see Table 11). This finding was consistent with previous research (Yuan et al., 2011) and indicated that blood centers should contact and educate students through email.

Significant differences were found between men and women and their blood donation attitudes, as well as their attitudes about blood donation barriers (see Table 7). Women were seen to have a more positive attitude about donating blood than that of men. Women also had lower perceptions of barriers to influence blood donation than that of men. Overall, men and women at MNSU had low perceptions of barriers to influence blood donation (see Table 7). This finding is inconsistent with previous research (Schreiber et al., 2006; Shaz et al., 2009; Yuan et al., 2011). This finding was surprising to the researcher and indicates that more convenient blood donation centers and blood donation incentives would not be necessary in order to increase blood donation behaviors among MNSU students.

Significant correlation was found between blood donation knowledge and blood donation intentions among current blood donors at MNSU (see Table 9). The results show that the more knowledge current blood donors have with respect to blood donation, the more intention they have to donate blood. This finding should be viewed with

caution due to a lack of internal consistency within the knowledge scale, but the findings were surprising to the researcher. This finding was also important to the researcher and is consistent with the idea from previous research stating that intention is the most consistent predictor of behavior (Ferguson et al., 2010; Jalalian et al., 2007). With the correlation between blood donation knowledge and blood donation intention, educational interventions should be employed to MNSU students to increase blood donation intentions and behaviors.

A lack of repeat blood donors was found among the MNSU population. Of the 205 blood donors among the sample, only 65.0% ($n = 132$) continued to donate blood beyond the first time. This finding was consistent with previous research (Padman et al., 2008; Zou et al., 2010). By increasing blood center efficiency and cleanliness, and by improving the blood donation process, it can largely influence the blood donation experience. The better experience a blood donor has initially, the more likely they will become a repeat donor (Padman et al., 2010).

Summary

The focus of this study was to assess the blood donation knowledge and intentions among MNSU students. The study also focused on blood donation attitude, confidence, and blood donation behaviors. Three hundred and sixty-four MNSU students participated in this study, all who were 18 years of age or older.

The blood donation intentions among current and non-blood donors were seen to be different. The mean blood donation intention score for current blood donors was higher than that of non-blood donors with respect to intending to donate blood within the next 12 months. The respondents' mean knowledge score was seen to be moderately low

when examining the results of the multiple-choice test regarding blood donation information. The mean score was just below the 50% correct rate, but caution should be noted due to a lack of internal consistency within the knowledge scale. A large percentage of the respondents' were also unaware of their blood type, their blood donation eligibility status, and whether they perceive themselves to have adequate knowledge regarding blood donation in the United States. The respondents' current blood donation behaviors were seen to be moderately low. Just over half of the respondents' reported having donated blood in the past. The blood donation retention rate among the respondents' was also seen to be low, with a large percentage of the respondents' only donating blood once.

The mean blood donation attitudinal scores of the respondents were seen to be high, indicating positive attitudes toward blood donation. The respondents' mean attitudinal scores with respect to blood donation barriers were also seen to be high, which indicates low perceptions of barriers to influence blood donation among MNSU students. The mean blood donation confidence scores were seen to be moderately high, thus indicating that the respondents' feel moderately confident when feeling capable of donating blood. A significant correlation was found between current blood donors' knowledge and their intentions to donate. The more knowledge current blood donors have, the more intention they have to donate blood, but caution should be noted due to a lack of internal consistency within the knowledge scale.

A significant difference was found between men and women and their blood donation knowledge, which had women compiling a higher mean knowledge score than that of men. Although differences were noted, the differences must be looked upon with

caution due to a lack of internal consistency within the knowledge scale. A significant difference was found between men and women and their blood donation attitudes, which had women compiling a higher mean attitudinal score than that of men; indicating a more positive blood donation attitude than that of men. A significant difference was found between men and women and their attitudes towards blood donation barriers, which had women compiling a higher mean score than that of men; indicating that women view blood donation barriers as less of a blood donation hindrance than that of men. Lastly, the respondents preferred method to receive information regarding blood donation information is by email.

The following chapter will provide a through explanation of what the results of this study could mean to health educators in the future, a summary of the study, conclusions, discussion, and future recommendations.

Chapter 5: Summary, Conclusions, and Recommendations

Introduction

The purpose of this study was to gain a better understanding of the relationship between blood donation knowledge and blood donation intentions among MNSU students, as well as a number of other factors. Exploring possible donation barriers such as a lack of knowledge can eventually contribute to new educational interventions aimed at improving blood donation knowledge. Ultimately, this could help improve the number of blood donors, which would help appease the blood shortage in the United States. In an attempt to explore factors that can negatively influence blood donation behaviors, this study examined the blood donation knowledge, attitude, intention, behavior, and confidence levels of the MNSU student population.

Study Summary

Participants in this study included a sample size of 364 MNSU students enrolled in at least one class for the 2011-2012 academic year. The participants were both male and female, all who were over 18 years of age. Participants voluntarily completed the 32-item online survey. All of the participants who met the research criteria were invited to participate through the online survey. The researcher developed survey contained questions that pertained to respondent demographics, blood donation knowledge, behavior, attitude, confidence, intention, and preferred methods to receive information regarding blood donation information.

Conclusion

In this study it was found that the mean intention score of past blood donors was 4.69. The mean intention score of non-blood donors was found to be a 3.04. Lastly, the

likelihood of current and non-blood donors to donate blood within the next 12 months was a mean score of 4.08 (see Table 4).

The respondents were found to have a mean knowledge score of 4.26. However, caution should be noted due to a lack of internal consistency within the knowledge scale. The study also found that 73.0% of the respondents know if they are eligible to donate, 12.2% do not, and 14.8% of the respondents are uncertain. The study found that 60.3% of the respondents do know their own blood type, whereas 39.7% do not. Lastly, 66.2% of the respondents feel they have enough knowledge with respect to blood donation information, whereas 25.0% feel that they do not, and 8.8% were unsure (see Table 5).

A slight majority of the respondents have donated blood in the past with 56.5%, whereas 43.0% of the respondents have not. In relation to those that have donated blood in the past, 65.0% have continued to donate blood beyond the first initial time, and 34.0% have discontinued donating blood after the first time (see Table 6).

The mean attitudinal score of the respondents was 6.48. The mean score of the respondents with respect to blood donation barriers was 1.31 (see Table 7). The mean blood donation confidence score among the respondents was found to be 5.21 (see Table 8). A significant relationship was found between knowledge and blood donation intentions. It was found that the blood donation intentions of current blood donors' increases as their blood donation knowledge increases, showing a positive correlation between the two variables (see Table 9). However, caution should be noted due to a lack of internal consistency within the knowledge scale.

A significant difference was found between men and women and their blood donation knowledge, attitudes, and their attitudes towards blood donation barriers (see

table 10). Although significant differences were found, caution should be noted with respect to knowledge due to a lack of internal consistency within the knowledge scale. Lastly, it was found that 60.6% of the respondents preferred method to receive information regarding blood donation information was by email (see Table 11).

Future Recommendations

Several recommendations are made by the researcher at the completion of this study.

Recommendations for improving research. The study was limited by time and resources. If more time was allotted for research, a better research design could have been formulated. A focus group could have been utilized, as well as an educational intervention aimed to raise education with respect to blood donation. Had this been done, pre-intervention, and post-intervention knowledge could have been assessed with respect to blood donation intentions among the MNSU student population.

The survey was administered online. This was convenient, but could have allowed for the respondents to make use of outside resources to answer the knowledge based survey questions. The survey was also produced for the purpose of this research; using an existing survey would have improved internal consistency and produced more accurate results. More detailed questions could have been asked in relation to blood donation barriers, knowledge, and intentions to help create a more detailed and more comprehensive study. A more broad study that spanned out to other universities could have allowed for more study participants and data collection. Lastly, by increasing the number of knowledge based questions, the internal consistency of the knowledge scale would have been increased.

Recommendations for health educators. Several recommendations for the health education profession can be drawn from this study. However, a limited lack of internal consistency within this study's knowledge scale makes it difficult to offer strong evidence-based recommendations based on blood donation knowledge. The research study shows that there is a need to raise blood donation knowledge. Blood donation intentions rise as the level of knowledge increases among blood donors in this particular study. This finding shows that a lack of knowledge can contribute to negative blood donation behaviors. It is important for health educators to recognize this and to facilitate educational interventions aimed to increase blood donation knowledge. With results from this particular study, these interventions could be email based. This would help reach a larger population and would appeal to a younger, technologically advanced age group. Additionally, health educators need to educate individuals at a young age to produce higher blood donation intentions, before they reach post-secondary school. This could help reduce the problem associated with young adults and their lack of blood donation behaviors.

The results of this particular study show that a slight majority of the respondents already donate blood, but the blood donation retention rate among the respondents is low. Health educators, especially those who work closely with blood collection facilities, need to recognize this issue and determine the most efficient blood donation process to help retain blood donors. Blood centers alone cannot reach and educate young adults about the crucial need for blood donors and blood products. Health educators need to collaborate with blood centers to help bridge the educational gap between young adults and blood donation knowledge. Health educators at a university setting can directly

communicate with the target population, which can positively influence blood donation knowledge, intention, attitude, and confidence. The role of the health educator can prove to be especially powerful to help alleviate the blood shortage.

Recommendations for future research. This study provides potential for future research by measuring how knowledge affects blood donation intentions. Based on the findings of this research study, a recommendation for future studies would be to use a larger knowledge assessment test to increase test reliability and to produce more accurate results. Using a more accurate and reliable survey instrument would also allow for more statistical analyses to be run with respect to correlations between blood donation attitude and intention, blood donation confidence and intention, as well as finding gender differences between the different categories. Examining blood donation knowledge and intentions before and after a blood donation educational campaign would have provided better insight into the relationship between blood donation knowledge and blood donation intentions. The ability to incorporate a more diverse sample into the study would have also been beneficial to the study results and findings.

Few previous studies looked at knowledge as a factor to influence blood donation intentions. There is a lot of potential for future studies to examine this concept and to figure out other important factors that can increase blood donation behaviors among the young adult population. As the need for blood in the United States rises, educational programs aimed to increase blood donation knowledge, attitude, confidence, and intentions should be promoted. In order to establish more links and underlying issues that hinder blood donation behaviors, additional research in this area is advisable.

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Appendix A

IRB Approval



February 6, 2012

Dear Dawn Larsen:

Your proposed changes to your Minnesota State University approved research ([286757-2] Assessment of Selected University Students' Knowledge of Blood Donation and the Relationship with Intent to Donate Blood) have been accepted as of February 6, 2012. Thank you for remembering to seek approval for changes in your study.

If you make additional changes in the research design, funding source, consent process, or any part of the study that may affect participants in the study, you will have to reapply for approval. Should any of the participants in your study suffer a research-related injury or other harmful outcome, you are required to report them to the IRB as soon as possible.

The approval of your changes is attached to your original proposal; therefore, the original approval date has not changed. When you complete your data collection or should you discontinue your study, you must notify the IRB. Please include your log number with any correspondence with the IRB.

This approval is considered final when the full IRB approves the monthly decisions and active log. The IRB reserves the right to review each study as part of its continuing review process. Continuing reviews are usually scheduled. However, under some conditions the IRB may choose not to announce continuing review or a modification.

I wish you success in your research. If you have any questions, feel free to contact me at patricia.hargrove@mnsu.edu or 507-389-1415.

Cordially,

A handwritten signature in cursive script that reads "Patricia Hargrove".

Patricia Hargrove, Ph.D.
IRB Coordinator
Mary Hadley, Ph.D.

A handwritten signature in cursive script that reads "Mary Hadley".

Mary Hadley, Ph.D.
IRB Co-Chair

Appendix B

Informed Consent to Participate in Research Study

You have been selected to participate in research regarding the assessment of university students' knowledge of blood donation and the relationship with intent to donate blood. This survey should take about ten minutes to complete. The research will be supervised by Dr. Dawn Larsen of Minnesota State University, Mankato's Department of Health Science. Participation in this research is completely voluntary and responses will be kept confidential. However, keep in mind that whenever one works with data collection through email, there is a slight risk for compromising confidentiality, anonymity, and/or privacy. Despite this possibility, the risks to your physical, financial, social, professional, or emotional well-being are considered 'less than minimal'. There is no direct benefit associated with your participation in this research. You must be 18 years of age or older to participate in this research.

You have the option to forego any survey questions that you wish. The refusal or denial of consent or by not participating in this research will not affect your relationship with Minnesota State University, Mankato. Submission of the completed survey will be interpreted as your informed consent to participate, as well as the confirmation that you are indeed 18 years of age or older.

If you have any questions regarding the research, feel free to contact Dr. Dawn Larsen via email at m-dawn.larsen@mnsu.edu, or Jeffrey Allerson at jeffrey.allerson@mnsu.edu. If you have any questions regarding the treatment of human subjects, contact IRB Administrator Dr. Barry Ries, at 507-389-2321. If you would like more information regarding the posed risks to privacy and anonymity by completing

online surveys, please contact the Minnesota State University, Mankato Information and Technology Services Help Desk (507-389-6654) and ask to speak to the Information Security Manager.

Print a copy for your records

Appendix C

Survey Instrument

Blood Donation Knowledge and Attitude Assessment

Thank you for taking the time to complete this 32 question survey. Please complete the following survey to the best of your ability. The results will be used to assess university students' knowledge regarding blood donation information.

The following definition was used to help develop the survey:

Intent Level: A measure of the extent to which an individual is motivated to donate blood (Giles, McClenahan, Cairns, & Mallet, 2004).

1. Are you:
 - A. Male
 - B. Female
 - C. Other

2. What is your age? _____

3. What is your ethnicity?
 - A. White/Caucasian
 - B. Black/African American
 - C. Spanish/Latino/Hispanic
 - D. Asian/Pacific Islander
 - E. Other _____

4. Approximately what percent of all Americans are eligible to donate blood?
 - A. 10%
 - B. 40%
 - C. 60%
 - D. 80%

5. How often does someone in the United States need a blood transfusion?
 - A. Once every day
 - B. Once every six hours
 - C. Once every minute
 - D. Once every two seconds

6. In most states, how old must you be in order to donate blood in the United States?
- A. 17
 - B. 18
 - C. 21
 - D. There is no age requirement
7. Approximately what percent of all eligible donors in the United States actually donate blood?
- A. 5%
 - B. 10%
 - C. 20%
 - D. 40%
8. A blood donation is one pint of blood. How many lives can one pint of blood save?
- A. 1
 - B. 3
 - C. 5
 - D. 10
9. Can blood be artificially manufactured?
- A. Yes
 - B. No
10. The entire donation process, from the time you arrive to the time you leave, takes about one hour. The process entails four different phases which includes registering, answering a medical history questionnaire, collecting the blood, and finally receiving refreshments. On average, how long would you expect the blood collection phase to last?
- A. 10 minutes
 - B. 20 minutes
 - C. 30 minutes
 - D. 40 minutes
11. To be eligible to donate blood in the United States, the minimum weight requirement for a donor is at least how many pounds?
- A. 70 pounds
 - B. 90 pounds
 - C. 110 pounds
 - D. 130 pounds
12. Eligible donors can donate a pint of blood how often?
- A. Once a week
 - B. Once every 2 weeks
 - C. Once every 4 weeks
 - D. Once every 8 weeks

Fact Source: American Red Cross. (2011). *Blood facts and statistics*. Retrieved from <http://www.redcrossblood.org/learn-about-blood/blood-facts-and-statistics>

13. Have you donated blood in the past (not including plasma)? If **no/I do not remember**, skip to question 16.

- A. Yes
- B. No
- C. I do not remember

14. Have you continued to donate blood beyond your first time?

- A. Yes
- B. No
- C. I do not remember

Please answer the following questions based on your own beliefs and how strongly you agree or disagree with each statement.

15. I intend to donate blood again within the next 12 months.

1	2	3	4	5	6	7
Strongly Disagree			Uncertain	Strongly Agree		

Continue to question 17

16. I intend to donate blood for the first time within the next 12 months.

1	2	3	4	5	6	7
Strongly Disagree			Uncertain	Strongly Agree		

17. I think donating blood is a positive behavior.

1	2	3	4	5	6	7
Strongly Disagree			Uncertain	Strongly Agree		

18. I think donating blood is unnecessary.

1	2	3	4	5	6	7
Strongly Disagree			Uncertain	Strongly Agree		

19. If I donate blood, I will be saving lives.

1	2	3	4	5	6	7
Strongly Disagree			Uncertain		Strongly Agree	

20. If I donate blood, I will feel pain.

1	2	3	4	5	6	7
Strongly Disagree			Uncertain		Strongly Agree	

21. Performing an act that can save lives is desirable to me.

1	2	3	4	5	6	7
Strongly Disagree			Uncertain		Strongly Agree	

22. If I knew more about blood donation in the United States, I would be more likely to donate blood.

1	2	3	4	5	6	7
Strongly Disagree			Uncertain		Strongly Agree	

23. I am confident that I could donate blood if I were asked to do so.

1	2	3	4	5	6	7
Strongly Disagree			Uncertain		Strongly Agree	

24. With the current information I know, I am capable of making an appointment to donate blood.

1	2	3	4	5	6	7
Strongly Disagree			Uncertain		Strongly Agree	

25. I believe donating blood takes too much time.

1	2	3	4	5	6	7
Strongly Disagree			Uncertain			Strongly Agree

26. I believe donating blood is too much of an inconvenience.

1	2	3	4	5	6	7
Strongly Disagree			Uncertain			Strongly Agree

27. I would be more likely to donate blood if I were paid to do so.

1	2	3	4	5	6	7
Strongly Disagree			Uncertain			Strongly Agree

28. How likely are you to donate blood within the next 12 months?

1	2	3	4	5	6	7
Very Unlikely			Uncertain			Very Likely

29. Do you know if you are eligible to donate blood?

- A. Yes
- B. No

30. Do you feel like you have adequate knowledge regarding blood donation in the United States?

- A. Yes
- B. No
- C. I do not know

31. Do you know your own blood type?

- A. Yes
- B. No

32. If you had to choose a method to receive information regarding blood donation information, which would you prefer?

- A. Email
- B. Telephone
- C. Mail
- D. Pamphlets
- E. Educational class at MNSU
- F. Other

