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# The Relationship among Math Anxiety, Mathematical Performance, and Math Education in Undergraduate Nursing Students

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The Relationship among Math Anxiety, Mathematical Performance, and Math Education in

Undergraduate Nursing Students

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### Abstract

Although nurses spend up to 40% of their day calculating and administering medication doses, undergraduate nursing students often perform poorly on nursing math exams. The purpose of this study was (a) to examine the relationship among mathematical education, performance, and anxiety and (b) to compare the mathematical education, performance, and anxiety in sophomore and senior baccalaureate nursing students at a public university in the Midwest. This cross-sectional, descriptive study was guided by Bandura's self-efficacy theory. Math performance was measured with an 11-item math instrument, math education was measured with number of math courses, and math anxiety was measured with Fennema–Sherman Mathematics Attitudes Scale. The sample (N=164) was 17% males and 83% females (age mean=22 years, SD=5.24). Approximately 60% of subjects were sophomores. Regardless of math education, math performance moderately and negatively correlated with anxiety dimensions, ( $r=-.39$  to  $-.46$ ,  $p < .001$ ). No differences in math anxieties and math performance were found in sophomore and senior levels. Analysis with randomly selected female cases to create equal gender groups (N=63) showed no gender differences in math performance, math education, and math anxiety dimensions except for anxiety taking math tests ( $t=-2.24$ ,  $p=.03$ ), with females reporting higher anxiety than males reported.

*Keywords:* math\*, competence\*, posology, basics, numeracies, anxiety\*, drug, and medication

### **The Relationship among Math Anxiety, Mathematical Performance, And Math Education**

Math performance is often a part of medication administration that is overlooked. Incorrect math calculations may contribute to medication errors (McMullan, Jones, & Lea, 2012), which affect 1.3 million people in the United States annually and result in the death of one person daily. According to McMullan et al. (2012), between 65% and 87% of medication errors occur during the prescription and administration stages. Although medication administration accounts for up to 40% of the time nurses work (McMullan, et al., 2012), nursing students often perform poorly on the math exams they take throughout their nursing education. This is a problem because nursing students may need to correctly calculate medication dosages when they become registered nurses (RN), and poor calculation skills can lead to errors.

Researchers have found that limited past mathematical experience can lead to lower math abilities and greater anxiety (Roykenes & Larsen, 2010). McMullan and colleagues (2012) found that one of the main predictors of drug calculation ability is numerical ability. Therefore, nursing students' math aptitude and performance on mathematical examinations may predict medication errors. Newton, Moore, Harris, and Pittiglio (2010) found a strong, positive correlation between math aptitude and the ability to pass a certified medication calculation assessment on the first try. This means that the better one was at math, the better he or she may do passing the medication calculation assessment. Lastly, anxiety in mathematics can lead to many problems for nurses; Pozehl (1996) compared undergraduate nursing students' anxiety and math calculation ability to that of undergraduate students in other fields. This study found that nursing students' anxiety was proportionally greater than their undergraduate counterparts, and math scores and anxiety were negatively related, e.g., as math-related anxiety increased, math scores decreased. The purpose of this study was to examine the relationship among

mathematical education, math anxiety, and math performance in BSN students. Three main questions will be answered:

1. What is the relationship between math education and math exam performance in undergraduate baccalaureate nursing students?
2. What is the relationship between math performance and math anxiety in senior and sophomore BSN students?
3. How do math anxiety and math performance in sophomore nursing students compare with math anxiety and math performance in senior nursing students? Good, nice and clear

### **Review of Literature**

Mathematics is a universal subject; however, in a literature review of articles since the 1930's, Eastwood, Boyle, Williams, and Fairhall (2011) found low levels of mathematical calculation proficiency in nurses across these studies, suggesting poor mathematical skills in nursing students and nurses pre and post NCLEX completion. Because of findings like this and the relevance of mathematics to everyday life, the investigators decided to study and examine the relationship between math skills and anxiety. A significant concern is that low calculation skills in current and future healthcare providers may lead to medication errors, which could potentially have a devastating impact on patients (Warburton, 2010). Many researchers have examined math ability in nurses and nursing students (Coyne, Needham, & Rands, 2012; McMullan, Jones, & Lea, 2010; Røykenes & Larsen, 2010). McMullan et al. (2010) examined numerical ability in 44 nurses and 229 nursing students and found low numerical ability in both. Coyne et al. (2012) investigated the relationship between math self-efficacy and math performance in 156 second year Bachelor of Nursing students; they found a positive correlation between math self-efficacy and math performance and also significant positive relationships between math self-efficacy,

drug calculation self-efficacy, and drug calculation performance. The findings are in line with those of Røykenes and Larsen (2010), who studied beliefs of mastering drug calculations and self-assessment of mathematical ability in 116 first year Bachelor of Nursing students. They found a strong, positive correlation between beliefs of mastering the drug calculation exam and self-assessment of mathematics ability. In summary, regardless of the variation of outcomes, researchers have consistently found that math self-efficacy is positively related to math performance in nurses and nursing students. That is, when math self-efficacy is higher, math performance is higher in this population. They have further found that, although previous mathematical ability may be established, nursing students lack accuracy and numeracy ability (Brown, 2002; Eastwood, et al., 2011; Warburton, 2010).

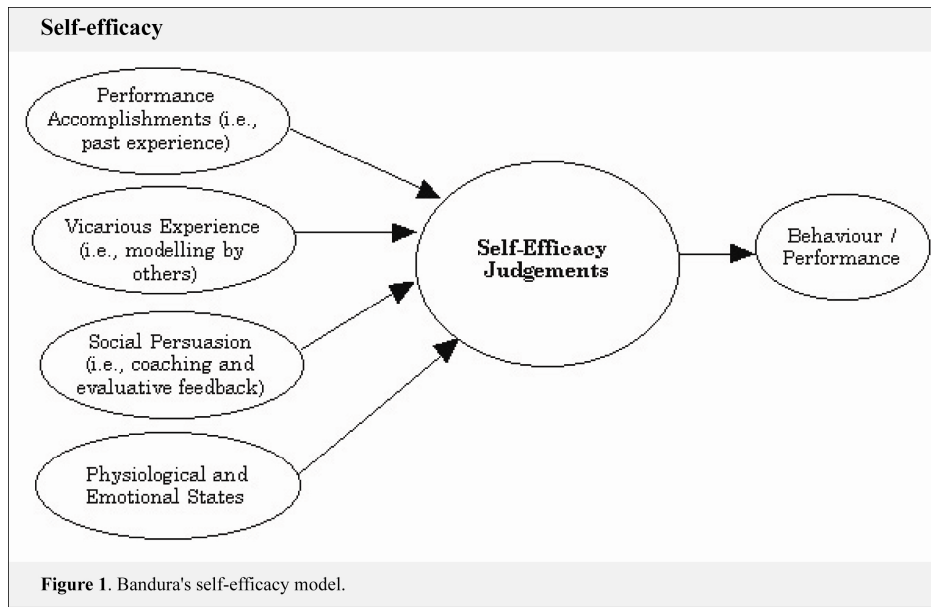
Although researchers have found low math and drug calculation performance in nursing students, the specific reasons for these results are unclear (McMullan, et al., 2010).

Consequently, researchers have investigated factors associated with mathematical ability in nurses and nursing students for many years. Those factors include the ability to perform mathematical calculations, mathematical experiences, and personal confidence in performing mathematical calculations (Coyne, et al., 2012). Some of the more prevalent factors include poor basic numerical skills, anxiety towards learning mathematics, and or a lack of confidence. On the other hand, Newton, et al. (2010) found that math aptitude, alone, does not fully explain why nursing students commit conceptual errors during the calculation-solving process. They demonstrate that reading aptitude could be an attributing factor of calculation performance. Newton et al. (2010) recommended that nursing educators must recognize that performing medication calculations requires more than just basic mathematical ability and that nursing students need to also possess strong reading skills and, more importantly, the ability to

understand the concepts being represented by the words in dosage calculations. Overall, further mathematical education is required for nursing students, and the mathematical prerequisites of nursing courses may need to be reviewed (Eastwood, et al., 2011). Good

### **Theoretical Framework**

This study was guided by Bandura's (1977) self-efficacy theory. Self-efficacy is the belief that one is capable of successfully performing a task from past experiences or other factors (e.g., see Figure 1). Bandura (1986) eventually embedded self-efficacy in his more general social cognitive theory that became the overarching theoretical framework of the self-efficacy construct. In his revised framework, although anxiety and self-efficacy are inversely related, a person's self-efficacy level is not as much influenced by the presence of the anxiety as by the interpretation of its presence by the individual. McMullan, et al., (2012) described Bandura's self-efficacy construct by relating it to the common cliché of one feeling "butterflies" in his or her stomach. Bandura believed that the "butterflies" will be interpreted according to the person's beliefs. One with low self-efficacy will see them as a sign of his or her inability that will decrease their self-efficacy further and produce more anxiety, but a person with high self-efficacy will interpret "butterflies" as a normal something that is not related to his or her ability to do poorly or do well.



Based on Bandura's research and teaching, low self-efficacy and high anxiety will negatively influence the results on the exams as much as past mathematical experiences. Based on framework, it is anticipated that if one has a high level of math education and low anxiety, the scores will be higher on the math examination than if they have less math education and higher anxiety. According to Bandura, a higher education will provide one with a higher sense of self-efficacy so that he or she may interpret the anxiety in a positive manner.

### Methods

This cross-sectional, descriptive study was guided by Bandura's self-efficacy theory and uses convenience sampling. After this study was approved by the University Institutional Review Board, data was collected on an individual's demographic information, a short test analyzing one's mathematical ability, and an individual's perception on taking, solving, learning, and thinking about math. Recruitment and data collection began after professors of sophomore and senior level courses allotted time during class to conduct research. The anonymous survey was given to each individual with the option to drop out any time after beginning the study. Once informed consent was received (see Appendix E for the Consent Form Administered to



Students), participants were instructed to complete the survey and return both complete and incomplete surveys to the primary investigator, faced down to ensure discrepancy. Once the survey was turned in, this showed the subject's consent to participate.

### **Setting and Sample**

The population includes 597 undergraduate students from the school of nursing at a large urban public university in the Midwest United States. Inclusion criteria include that participants need to be a minimum of 18 years of age and have to be pursuing a BSN degree. No participants are excluded based on gender, ethnicity, or age, as long as they are at least 18 years of age, except those who already have their BSN degree.

### **Sampling and Data Collection Procedures**

To not increase anxiety, words like test or exam were not used during the administration of this survey. Convenience sampling was used for this study; sophomore students from the Foundations in Nursing class and seniors in their first semester courses were given the chance to participate. After previously talking to the professors and obtaining their approval, surveys were distributed to those that were willing to participate. Upon gaining access to class time, potential participants were informed that completing surveys was voluntary with an option to withdraw at any time. Additionally, the participants were informed that completed and submitted surveys would convey consent to use the information provided on the surveys.

Through convenience sampling, data were collected with printed surveys administered to sophomores and seniors in the fall of 2014. Data were collected during sophomore and senior level classes and participants had time before or after class to complete surveys. There was no time limit on the survey and calculators were not permitted. The survey included demographic data, such as participant's age, gender and their highest level of math education that has been

taken (see Appendix A for the demographic survey). Next were 11 basic mathematical problems to measure math performance (see Appendix B for the math performance survey). The performance survey was followed by 12 questions about math anxiety (see Appendix C for the anxiety survey). With the cover page in its original position, all surveys were returned directly to the co-investigators, face down, and then stored in the locked file cabinet of the project sponsor. All collected data was destroyed once the study was finished. Only the co-investigators and sponsor were able to access the data.

### Measures

Math anxiety was measured with the 12-item Fennema–Sherman Mathematics Attitudes Scale (MAS), which has high validity and reliability to measure anxieties surrounding mathematics (McMullan et al., 2012). Participants were asked to respond to each item using a 5-point Likert-type scale (1 = strongly disagree, 5 = strongly agree), which is an ordinal measurement, giving researchers a better understanding of the extent of math-related anxiety (see Appendix C for MAS survey). The questions included items that are both positively worded and negatively worded in order to promote accuracy. For scoring, the positively worded items were reversed so that a high score indicated high anxiety. In addition, the questions can be broken down into separate categories surrounding math anxiety including: thinking about math (4 questions), taking math exams (3 questions), learning math problems (2 questions) and solving math (3 questions).

Math performance was measured with a student-constructed, 6<sup>th</sup>-grade math tool with 11 items adapted from the *California Department of Education* (2008) practice exam online for 6<sup>th</sup> graders. These items measure knowledge in the foundations of math: #1-Addition and subtraction of fractions, #2-Multiplication and division of fractions, #3-Percent and

multiplication with a decimal, #4-Long division with a decimal, #5-Order of operations, #6-Simple addition and subtraction, #7-Unit conversions, #8-Fraction to a decimal, #9-Decimal to a fraction, #10-Solving for  $x$ , #11-Number line with fractions (see Appendix D for the breakdown of total problems missed out of 164 participants). Out of the 164 participants, division with a decimal was missed the most, 70.7%, and simple addition and subtraction was missed the least, 34.1%. Each question was fill-in-the blank except for the last one that gave the exam-taker six possible answers to choose from. A blank question was considered wrong once a test was submitted. To be sure the exam was accurate and correct; the math exam was verified and approved by Dr. Maroli (2014), who is the coordinator of basic mathematics at the Wayne College branch of the University of Akron.

Math education was measured with an item asking what the highest level of math class that was taken throughout their high school or college education. This was then related to the additional demographic data that was obtained.

### **Data Analysis Plan**

Analysis of the data included hand-grading all of the tests and surveys and putting them into MiniTab on the computer which helped with analyzing the data. From that point, data were imported into SPSS 21. Descriptive statistics were used to describe the sample and variables, Pearson correlation coefficients were used to determine relationships, and independent t-tests were used to determine group differences. The level of statistical significance was set at  $p < 0,05$ .

## **Results**

### **Sample**

The convenience sample consisted of 164 participants. The sample consisted of 28 males (17%) and 136 females (83%). Additionally, 98 participants (60%) of the sample were sophomores. In comparison, 66 participants (40%) of the sample were seniors. Analysis with randomly selected female cases to create equal gender groups (N=63) showed no gender differences in math performance, math education, and math anxiety dimensions except for anxiety taking math tests ( $t=-2.24, p=.03$ ), with females reporting higher anxiety than males reported.

### **Research Questions**

Research questions 1 was: *What is the relationship between math education and math exam performance in undergraduate baccalaureate nursing students?* Pearson correlation coefficients were used to determine the relationship between math education and math performance. No relationship between math education and math performance was found (see Figure 2).

Research question 2 was: *What is the relationship between math performance and math anxiety in senior and sophomore BSN students?* Pearson correlation coefficients were used to determine the relationship between math education and math performance. Regardless of math education, math performance moderately and negatively correlated with math anxiety dimensions, ( $r=-.39$  to  $-.46, p < .001$ ).

Research question 3 was: *How do math anxiety and math performance in sophomore nursing students compare with math anxiety and math performance in senior nursing students?* Independent t-tests showed no education level difference in math anxiety and math performance, i.e., sophomore and senior levels of education. Further interventions should be explored into decreasing anxiety and improving performance through a nursing student's college career.

Anxiety and Performance Correlations		Math Performance	Taking Math	Solving Math	Thinking Math	Learning Math
Math Performance core	Pearson Correlation	1	-.462**	-.387**	-.395**	-.400**
	Sig. (2-tailed)		.000	.000	.000	.000
	N	164	161	161	160	162
Taking Math	Pearson Correlation	-.462**	1	.601**	.805**	.668**
	Sig. (2-tailed)	.000		.000	.000	.000
	N	161	161	161	159	161
Solving Math	Pearson Correlation	-.387**	.601**	1	.693**	.509**
	Sig. (2-tailed)	.000	.000		.000	.000
	N	161	161	161	159	161
Thinking Math	Pearson Correlation	-.395**	.805**	.693**	1	.708**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	160	159	159	160	160
Learning Math	Pearson Correlation	-.400**	.668**	.509**	.708**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	162	161	161	160	162

Figure 2. Correlations between anxiety and performance.

### Discussion

Published research has previously documented similar findings, and our research supports these findings. Coyne et al. (2012) investigated the relationship between math self-efficacy and math performance in 156 second year baccalaureate nursing students; they found a positive correlation between math self-efficacy and math performance and also significant positive relationships between math self-efficacy, drug calculation self-efficacy, and drug calculation performance. Results indicated if a person had high self-efficacy then they would have higher performance on math exams and drug calculations. Similarly, this corresponds to this study because as the participants' anxiety increased and had low self-efficacy, their performance scores decreased.

The findings are in line with those of Røykenes and Larsen (2010), who studied beliefs of mastering drug calculations and self-assessment of mathematical ability in 116 first year

Bachelor of Nursing students. A strong, positive correlation between beliefs of mastering the drug calculation exam and self-assessment of mathematics ability was indicated.

Correspondingly, McMullan et al. (2010) also did not allow the use of calculators during their study because calculators should not act as a substitute for arithmetical knowledge and skills. Using this method certainly created more anxiety within the students; this was made evident by the students' negative reactions during the administration of the survey including: debating, sighing, and questioning why he or she could not use a calculator. As the research shows, the increase of anxiety will negatively correlate with performance. Having a calculator can allow students to easily perform calculations; however, the students may not fully understand what they are specifically looking for by blindly calculating a solution, thus not allowing them to apprehend what they are looking for. Similar to Brown (2002), Eastwood, et al. (2011), and Warburton (2010), the research shows that no matter the background of math for an individual, nursing students lack accuracy and numeracy ability, and this could create problematic situations for new nurses administering medication after incorrect calculations.

The studies continually show that self-perception is a big component in one's potential of performing well on math tests and drug calculations. It is important to note that men as well as women had anxiety when it came to thinking, learning, and performing math and drug calculations. It is important for individuals to first believe in themselves and to have a high self-efficacy in order for them to fully perform to their full potential and deliver optimal care to their patients.

None of the research examined in this study was conducted prior to 2010 except for one useful study that was completed in 1996 in *Journal of Nursing Education*, which had many interconnected circumstances that this study found to be similar. Since an obligation for nursing

students in this program was a math medication calculation quiz, every semester, consisting of 20 questions with a 90% pass requirement, most assume that these students will be well prepared for real-world mathematical and medical endeavors; However, this study proves that throughout a student's educational career in nursing school, anxiety does not decrease with taking, solving, thinking or learning about math and performance does not increase. Therefore, there is a great need for a development of mathematical integration within the baccalaureate nursing programs in order to decrease the incidence of medication errors and better prepare future nurses.

### **Conclusion**

In summary, the findings suggest that performance was negatively correlated to anxiety categories, which include taking, solving, learning, and thinking about math. Additionally, the level of education in the nursing program, regardless of gender, did not determine math performance. Although previous mathematical ability may be established, nursing students lack accuracy and numeracy ability; thus correlating with other research showing that poor self-efficacy will lead to poor performance which associates strongly with calculation and medication errors.

### **Limitations**

One limitation was the larger percentage of first year sophomore students (60%) compared to the third year senior students (40%), as well as the fact that 83% of the population was female, with only 17% male. This created an uneven distribution of participants, which could have impacted the results. The uneven distribution of participants was related, in part, to recruitment efforts of gaining access from course instructors to come to class and recruit participants. Access and time restrictions were varied and imposed by instructors related to sophomore 15-week semester classes and senior 7-week rotations, two within a semester. Given

that many senior level courses are only seven and a half weeks long, many course instructors were reluctant to give up lecture time for recruitment due to the amount of material needing to be covered. Another limitation that posed a barrier is the availability and timeframe in which participants took the test. The sophomores were given the test after a two-hour class, and this was a barrier because many people were unenthusiastic to take the test or give forth their best effort. The participants also had no motivating circumstances that would push them to do better on the test because this survey did not affect their class grade nor did they earn benefits for participating in the study. During the test, some participants were talking and possibly sharing answers, which may have altered or impacted the results in some way. One final limitation is the use of convenience sampling. Using convenience sampling limits the variability of participants as was evident in this study.

### **Implications and Recommendations for Future Studies**

This study has implications for nursing practice, research, education, and curriculum development. The findings of this research study, as well as similar previous findings, may suggest that both male and female, sophomore to senior baccalaureate nursing students deal with anxiety when it comes to having to calculate math equations. As previously mentioned, research shows that as anxiety increases there is a strong negative correlation with one's performance. Therefore, future studies may examine the effect of implementing interventions on how to manage or perceive anxiety in order to perform better with math calculations. In addition, implementing a math course or workshop in nursing curriculums may help alleviate stress, and allow students to better calculate medication calculations, which often cause many medication errors in healthcare.



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## Appendix A

## Demographic Survey

**MATH****Demographics & Anxieties Survey For Honors Research**

Circle the selections that best describe yourself. Write your age and highest level of high school math taken.

Age? \_\_\_\_\_

Gender? \_\_\_\_\_ M \_\_\_\_\_ F

College Level? \_\_\_\_\_ Sophomore \_\_\_\_\_ Senior

Taken STATS? \_\_\_\_\_ Yes \_\_\_\_\_ No

Taken College Intermediate Algebra? \_\_\_\_\_ Yes \_\_\_\_\_ No

Taken College Algebra? \_\_\_\_\_ Yes \_\_\_\_\_ No

Highest High School Math Taken? \_\_\_\_\_

**Purpose:**

The purpose of this study is to examine the relationship among mathematical education, anxiety, and performance in students pursuing a bachelor's of science in nursing and to compare the mathematical education, anxiety, and performance in sophomore and senior students. This will be an anonymous survey with the option to drop out any time after beginning the study. Once the questionnaire is completed and turned in, this will show the consent to participate, and blank questions on a turned in survey will be considered incorrect.

## Appendix B

## 11 Question Math Exam

**MATH**

## Math For Honors Research

**Instructions:** NO Calculators Please. Answer all questions and follow directions.

Write your final answer in corresponding box

(1000mcg = 1mg = .001g) & (1000ml = 1L)

**Solve** (Write as a fraction in reduced form):

1.  $2/21 - 2/3 =$    
Answer

**Solve** (Write in any unit):

7.  $30000\text{mcg} + 0.04\text{g} =$    
Answer

2.  $2/3 \div 4 =$    
Answer

**Solve** (Write as a decimal):

8.  $1/8 =$    
Answer

**Solve:**

3. 8% of 65 =   
Answer

**Solve** (Write as a fraction in reduced form):

9.  $0.15 =$    
Answer

4.  $9 \div 2.5 =$    
Answer

**Solve for x:**

10.  $-2(x + 2) = 56$    
Answer

5.  $8 - 2(13 - 1) =$    
Answer

11. Which of the following fractions is closest to 0?

6.  $6.1 - 4.32 =$    
Answer

- c.  $-7/12$    a.  $5/6$    e.  $-1/2$   
d.  $2/3$    b.  $1/2$    f.  $-5/12$

Appendix C

12-item Fennema–Sherman Mathematics Attitudes Scale

# MATH

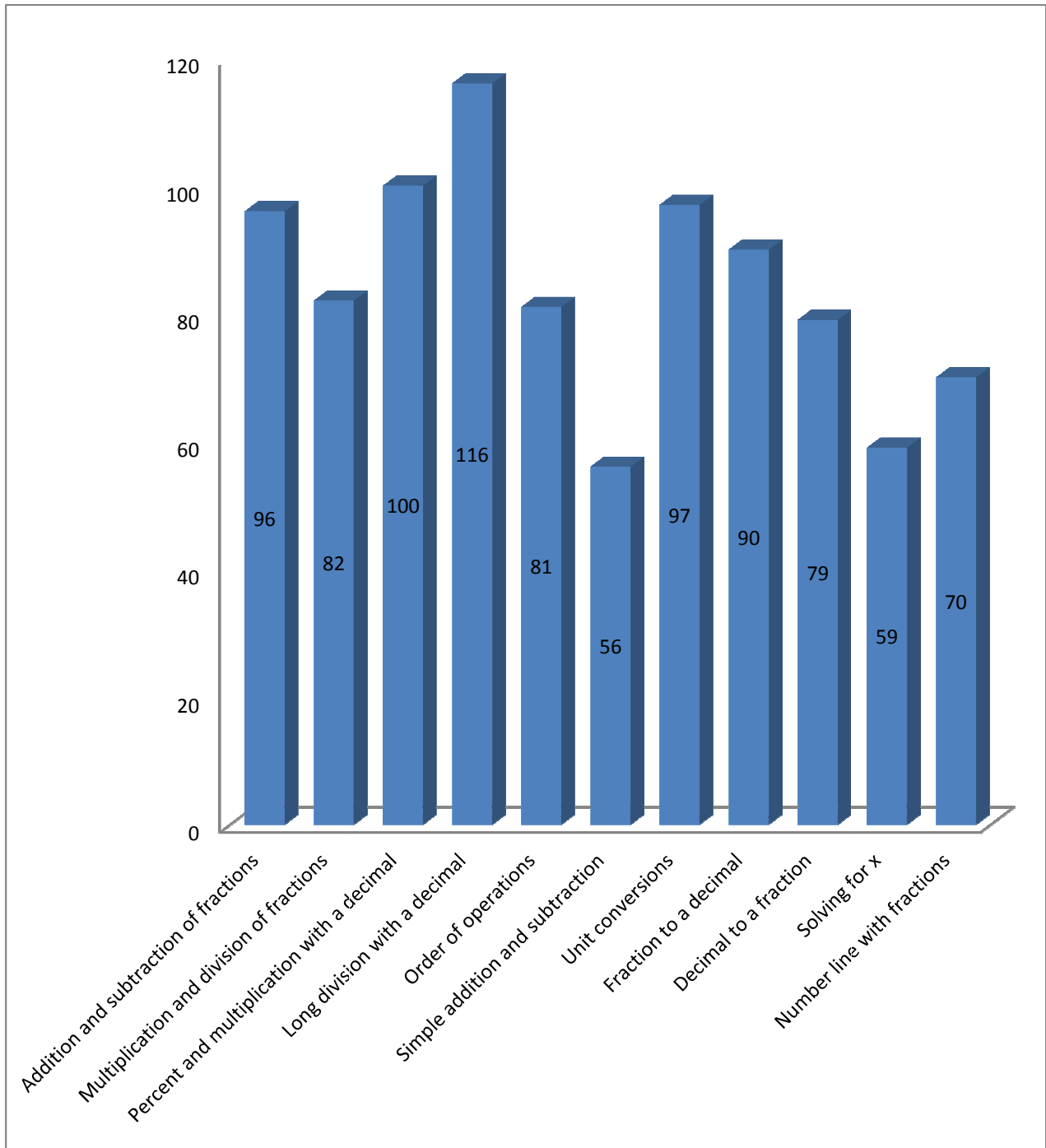
## Demographics & Anxieties Survey For Honors Research

In relation to the question, circle the selections that best describe yourself on a 1-5 scale where 1 is strongly disagree and 5 is strongly agree.

	Strongly Disagree				Strongly Agree
I am usually at ease during math tests	1	2	3	4	5
A math test would scare me	1	2	3	4	5
I do not usually worry about being able to solve math problems.	1	2	3	4	5
I seldom panic during a math test	1	2	3	4	5
Math does not scare me at all	1	2	3	4	5
I get a sinking feeling when I think of trying difficult math problems	1	2	3	4	5
It would not bother me at all to take more math courses	1	2	3	4	5
Math usually makes me feel uncomfortable and nervous	1	2	3	4	5
My mind goes blank and I am unable to think clearly when working math.	1	2	3	4	5
Math makes me feel uncomfortable, restless, irritable and impatient.	1	2	3	4	5
Math makes me feel uneasy and confused	1	2	3	4	5
I am usually at ease in math lessons	1	2	3	4	5

Appendix D

Number of Math Problems missed (N=164)



## Appendix E

## Consent Form Administered to Students

**Title of Study:** The Relationship among Math Education, Performance, and Anxiety in Undergraduate Nursing Students

**Introduction:** You are invited to participate in a research project being conducted by Josh Beall, Paul Penkalsky, and Troy Roebuck, who are three Honors Nursing Students in the School of Nursing at The University of Akron. Project Sponsors of this research project is Dr. Christine Heifner-Graor, Associate Professor of Nursing, The University of Akron.

**Purpose:** The purpose of this study is to understand mathematical education, math performance, anxiety about doing math in students pursuing a bachelor's of science in nursing (BSN). By identifying the relationship among math education, performance, and anxiety, we may be able to use this information to change the approach to math education and performance in nursing, which may lead to more effective math education, better performance, and hopefully better quality nursing care with less future math-related problems.

**Procedures:** The survey should take approximately 20 minutes to complete, and we estimate that approximately 200 nursing students will take part in this study. The first part of the survey asks you questions about yourself. The second part asks you to use basic math skills. The last part asks you how you feel about doing math. No identifying information is collected in the survey

**Exclusion:** Participants in our research project must be a sophomore or senior in the fall semester 2014. No other exclusion from participation will be made to any individuals who meet the aforementioned requirements.

**Risks and Discomforts:** There should be minimal risks to taking part in this study; however, you may experience discomfort when completing the survey because we are asking you about any anxiety you may feel when you are doing math.

**Benefits:** You will receive no direct benefit from participating in this study, but your participation may help us develop a better understanding of desirable approaches to math in nursing, which may lead to more effective math education, better math performance, and hopefully better quality nursing care with less future math-related problems. Students and educators may be able to develop a plan to help future nurses with math attainment.

**Right to refuse or withdraw:** Participation in this survey is completely voluntary. At any time, you have the right to refuse to participate or withdraw from the study with no penalty or consequences. Refusing to participate or withdrawing from the study will in no way affect your course grade.

**Anonymous and Confidential Data Collection:** No identifying information will be collected in the survey, and your anonymity is further protected by not asking you to sign and return the

informed consent form. Furthermore, at no time will the researchers identify a participant by name or other identifying information in reports and presentations. All information collected will be kept in a locked location on university property, and only the researchers and our project sponsor will have access to the data. Participants will not be individually identified in any publication or presentation of the research results. Only aggregate data will be used.

**Who to contact with questions:** If you have any questions about this study, you may email Josh Beall at [jb103@zips.uakron.edu](mailto:jb103@zips.uakron.edu), Paul Penkalsky at [pdp12@zips.uakron.edu](mailto:pdp12@zips.uakron.edu), Troy Roebuck at [tar57@zips.uakron.edu](mailto:tar57@zips.uakron.edu), or Dr. Christine Heifner Graor at [graor@uakron.edu](mailto:graor@uakron.edu). This project has been approved by The University of Akron Institutional Review Board. If you have any questions about your rights as a research participant, you may call the IRB at (330) 972- 7666.

**Acceptance:** I have read the information provided above and all of my questions have been answered. I voluntarily agree to participate in this study. My completion and return of this survey will serve as my consent. I have been given a copy of this consent form for future reference.