

## BSN nursing student's confidence level with dosage calculation after the implementation of a comprehensive teaching strategy.

Maryann Valcourt, PhD, CPNP; Deborah Smith, DNP, CNM, RNC; Eileen Caulfield PhD, RN, NEA-C; Alice Petillo, PhD; Kenya Fluellen, MSN-Ed; Jennifer Drapp DNP, CCRN-K

Why??

Teaching Strategy


Study

Recommendations

References



1.



Factors Affecting Competency

- Mastery of dosage calculation is essential for nursing students to safely administer medications and prepare for the NCLEX-RN licensing exam (NCSBN, 2018)
- Poor medication calculation skills may contribute to attrition and delayed progression in nursing programs. (Gidden & Meyer, 2016)
- Confidence, math beliefs, and success on previous dosage calculation assessments have been correlated with student over all success on dosage calculation assessments (Andrew, Salamonsen, Halcomb, 2009; Roykenes & Larsen, 2010)

2.

## Factors affecting dosage calculation competency

- Lack of knowledge of essential math skills
- Difficulty with applying math skills to dosage calculation problems
- Clinically relevant instruction
- Lack of reinforcement of dosage calculation skills throughout the program
- (Bagnasco et al.2016; Young et al. 2013)

3.



Desmos

## Description of Teaching Strategy

- Med Math Advisor role
- **Desmos** online calculator to add animations and images for clinical context to dosage calculation problems.
- Virtual case studies
- Low-fidelity simulation
- Progressive remediation throughout the semester

4.

MAR

Med Calculations

Evaluation

Mr. Harry Cohen, age 71 (2/14/1949), is admitted to room number 054 by Dr. Sussey at the hospital with "what feels like indigestion." Lab tests and EKG rule out a myocardial infarction. Mr. Cohen has a history of MI (myocardial infarction) x1 with stent placement, CHF (congestive heart failure), HTN (hypertension) and Type 2 diabetes. He has no allergies. His medical record number is 55667788.

It is 0900 and you just received your medications

Medication orders:  
- digoxin 0.25 mg po daily

Name	
Date of Birth (DOB)	
Medical Record Number (MRN)	
Room Number	
Allergies	
Gender	
Diagnosis	
Physician	

Medication Order	0700 - 1900	1900-0700

5.

6.

7.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Gertrude Blanch														
Aiyabhatta														
Elbert Frank Cox														
Shakuntala Devi														
Talitha Washington														
Cynthia Breazeal														
Thomas Fuller														
Nkechi Agwu														
Kiran Gandhi														
Al-Khwarizmi														
Gloria Conyers														
Vivienne Malone														
Terence Tao														
Kyno Santos														
Shino-Shen Chern														

8.



Research Question

## Purpose


*The purpose of this study was to describe the experience of BSN traditional and accelerated nursing students acquiring confidence with dosage calculation skills after the implementation of a comprehensive dosage calculation teaching strate*



9.

## Research Question

*What is the experience of BSN traditional and accelerated nursing students in gaining confidence in dosage calculation skills after the implementation of a comprehensive dosage teaching strategy?*



10.

## Methods

***Study design:** mixed methods exploratory descriptive survey design*

***Methods:** Data was gathered through the use of a secured google forms link. Marymount University IRB procedures were followed and approval was given. The variable student confidence was measured by using a dosage calculation skills inventory. This inventory measures students' confidence level with essential math and dosage calculation skills based on a Likert scale. The inventory include open ended questions asking the student to describe math beliefs and how the experience of the teaching strategy supported their development of confidence in dosage calculation*

***Sampling:** BSN and ABSN nursing students were recruited from Spring 2021-Spring 2022. A total of 52 students were recruited with n=12 study participants. Students were given a consent via the online googles form.*

***Data Analysis:** Descriptive statistics and measures of central tendency were used to analyze quantitative data. Grounded Theory methods were used to analyze qualitative data.*

11.

## Quantitative Data - Types of Calculations

Type	Mean	Standard Deviation
Dose calculation	4.5	0.797724035
Weight based peds	4.166666667	0.937436867
Weight based adults	4.333333333	0.651338947
Safe therapeutic range	4.583333333	0.651338947
IV flow rates gravity	3.666666667	0.651338947
IV flow rates pump	4.166666667	0.240999602
Special IV Fluids Critical Care	1.666666667	2.015094554
Special IV Fluids Maternal	1.166666667	1.64224532

12.

## Qualitative Data

*Describe you experience with previous math classes.*  
Most common theme: **Struggle**

*Which of the following strategies most supported your learning: Desmos, medication skill labs, review/remediation/study hall?*  
Most common theme: **Review/remediation/ study hall**

*How did the strategies support your learning?*  
Most common theme: **Repetition, explanation**

13.

## Limitations

- *Sample size*
- *No previous assessment data for comparison*
- *Student repeated class*
- *Clinical course*
- *Variability in review and study sessions*
- *Online/hybrid teaching methods*

14.

## Conclusion

*Students indicated high levels of confidence post intervention in the majority of dosage calculation skills. Repetition and review of dosage calculation concepts best supported student learning.*

15.

Future  
Research

Policy

Recommendations  
include:

- *Assessment of and remediation of essential math skills prior to entry to the nursing program to intervene earlier.*
- *Math course prior to the nursing program.*
- *Continue with med math advisor role to support students in the program.*



16.

## Future Research

- *Secondary analysis of students competency quizzes as they progress through out the program to see if there is improvement in competency.*
- *Med math competency as a predictor of success in the nursing program.*

17.

## Policy

*Standardization in nursing curriculum regarding math education*

18.

## References

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19.

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