Educating Oncology Nurses on a Toolkit Standardizing a Method for Ordering *C. diff* Testing in an Outpatient Clinic

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Introduction/Background

- Clostriudium difficile is an opportunistic bacterium in which the normal microbial flora of the gut becomes imbalanced and can cause infection
- The incidence of *C. diff* infection in the general population is 1-2%, however, in patients with cancer the risk is increased seven-fold with an incidence of 7-14%.
- Studies have shown 20-25% off all *C. diff* cases have their onset in the community and therefore are diagnosed in the outpatient setting
- Reports have shown that C. diff infections have increased hospital costs up to 1.5 billion dollars

Clinical Significance

- At an urban academic medical center on the east coast, while there are standards and protocols in the inpatient setting, there is no standard to testing for *C. diff* infections in the outpatient oncology center.
- Having a standardized method for testing for *C. diff* allows for more accurate detection of *C. diff* infections in the outpatient setting leading to early treatment and a decrease in morbidity and mortlity

Aims

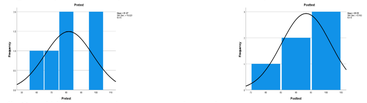
- Aim 1: To educate the nursing staff over an 8-week period on a toolkit standardizing testing for C. diff infection in the outpatient oncology clinic
- Aim 2: To improve nursing knowledge in testing patients for *C. diff* infections with the education provided on a standardized toolkit via the online learning module
- Aim 3: To measure if there is a change in the number of *C. diff* tests sent by the outpatient center after the 8-week period that the educational module in instituted in the clinic

Methods

Setting: the oncology clinic outpatient center in a mid-Atlantic urban academic hospital.
Design: a cohort study and a pre-intervention and post-intervention study design. A chart review of raw lab data was used to measure if there is an increase in the number of *C. diff* testing in the outpatient center increases after teaching
Sample/Sample Size: a convenience sample of all nurses working in the outpatient oncology clinic.
Intervention: educational online learning module. The module was created using the APIC, IDSA & SHAE guidelines for sending *C.* diff tests on patients
pre and post-test were embedded into the beginning and end of the module
Measures: pre and posttest were comprised of ten evidence-based questions on the content within the module. Each questionnaire was scored out of 100%.

Statistical Analysis

Sociodemographic data was analyzed looking at descriptive statistics, such as mean, median and standard deviation
The plan for analyzing the pre and posttest data from the module was originally to use a paired T-test for significance
Due to the small sample size a Wilcoxon signed rank test was used for significance
The data meets the assumptions that the dependent variable is measured in a continuous interval, the independent variable is made up of two categorical groups of pretest and posttest, and the distributions of the two groups are symmetrical in shape



to compare the number of *C. diff* samples sent by the outpatient oncology clinic a rate increase calculation will be used to see if there is an increase in the percentage of tests

Results

Sociodemographic

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Age	6	25	42	33.17	6.969
Valid N (listwise)	6				

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Years of Nursing Experience	6	3	15	8.33	4.274
Valid N (listwise)	6				

Aims 1&2

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum	Percentiles 25th	50th (Median)	75th
Pretest	6	81.67	16.021	60	100	67.50	80.00	100.00
Posttest	6	93.33	8.165	80	100	87.50	95.00	100.00

Test Statistics[a]

	Posttest - Pretest
Z	-1.633[b]
Asymp. Sig. (2-tailed)	.102

a. Wilcoxon Signed Ranks Test
b. Based on negative ranks.

Aim 3

- number of *C. diff* tests sent by the outpatient oncology clinic in the month of November 2020 was 0. In the month of February 2021, there were 2 *C. diff* tests sent
- resulted in a 200% increase in the rate of the number of *C. diff* tests sent by the outpatient oncology center after the learning module was completed

Conclusion

- While a Wilcoxon signed rank test did not show a statistically significant increase in the average score of the pre and posttest, looking at the raw data there was an increase in the mean score of the pretest of 81.67% to 93.33% in the post test.
- There was a 200% increase in the rate of tests that were sent by the outpatient clinic before and after the nurses completed the module.
- One large limitation of this study was the small sample size of 6. Also, this study was performed during the COVID-19 pandemic making it challenging to obtain nursing engagement

Discussion

- While a Wilcoxon signed rank test did not show a statistically significant increase in the average score of the pre and posttest, looking at the raw data there was an increase in the mean score of the pretest of 81.67% to 93.33% in the post test.
- There was a 200% increase in the rate of tests that were sent by the outpatient clinic before and after the nurses completed the module.
- One large limitation of this study was the small sample size of 6. Also, this study was performed during the COVID-19 pandemic making it challenging to obtain nursing engagement

Translation into practice

- For long-term sustainability, this module can/will be used annually for competencies and education on sending *C. diff* samples in the outpatient oncology clinic
- Moving forward, it would benefit to institute this study over a longer period of time timeline should be altered so that data can be collected on the number of *C. diff* tests sent by the site over a two-month period
  - the module can be implemented over a four-month period
  - post data can again be collected on the number of *C. diff* tests sent by the site over a two period after the module
- Timeline will allow for a more time to gain larger nursing involvement and a larger sample size increasing significance.