**Quantitative Research Critique**

Reem Boudali, Sukie Chaggar, Alaa Elourfali, Joanne Ta

Faculty of Nursing, University of Windsor

NURS 3950-2: Nursing Research

Dr. Eric Tanlaka

November 15, 2021

**Quantitative Research Critique**

|  |  |  |
| --- | --- | --- |
|  |  | **Max. Points**  |
| **Study Purpose:** Was the purpose and/or research question stated clearly?ÿ Yes ÿ NoAre the hypotheses clearly stated?ÿ Yes ÿ No | State the purpose of the study and the research question. The purpose of the study was clearly stated as it was mentioned in the abstract, background, and discussion. The purpose of the study is to evaluate the educational module on nosocomial infection (NI) control to determine whether it would increase nurses’ knowledge and practice regarding NI control. This was more of a purpose statement while there was no research question noted. | /4  |
| **Study Design:** What study design was used?ÿ Randomized control trialÿ Descriptive studyÿ Quasi-experimental studyÿ Retrospective studyAre the study concepts defined conceptually?ÿ Yes ÿ No Are the study concepts defined operationally?ÿ Yes ÿ No | Was the study design appropriate for the research question and purpose? Explain your rationale. Provide examples of how study concepts were defined. Were definitions appropriate for the study design?Using a randomized control trial was appropriate for the research purpose of evaluating whether the educational module increased the nurses’ knowledge on controlling NIs because it allows researchers to see the baseline levels before the intervention. This was done to compare the baseline levels to the knowledge level after the intervention; an increase would mean the intervention was effective. The waitlist group, which is the control in the study, also allows the researchers to be certain that it is their intervention that created the change and not external factors. NIs were defined both conceptually (an infection obtained in the hospital) and operationally (infection acquired 48 hours after hospital admission). For the actual study variables, like knowledge of NI control, the authors summarized the concepts that were taught in the modules (prevention of transmission from person-to-person and from hospital environment through use of hand hygiene, personal protective equipment, safe hospital waste handling, etc.). Knowledge was defined operationally through questionnaire scores, where a higher numeric score indicated more knowledge on the topic. The study concepts were all defined appropriately for the study design because it allowed for the knowledge to be objectively compared pre and post-test with the intervention and control group.  | /8 |
| **Literature Review:** Was the literature review thorough?ÿ Yes ÿ NoWhat sources were included in the review?ÿ Primary ÿ Secondary  ÿ Both Was there evidence of critical appraisal of included studies?ÿ Yes ÿ No | Describe the rationale for need for this study. Was it clear and compelling? Was relevant background literature reviewed to lay the foundation for the study? What were the gaps in knowledge?There is a need for this study because it evaluates nurses’ knowledge on NIs and implements an educational module. In previous studies, a lack of knowledge on the management of NIs was reported by nurses. The need was clear and compelling as it used statistics to highlight the severity of NIs. For example, 1.4 million individuals globally are infected each year (Samuel et al., 2010). Relevant background literature was reviewed to lay the foundation for this study. Data was drawn from a number of previous studies in order to identify gaps and formulate a more accurate and effective study. For example, the effectiveness of educational interventions was identified; however, it was found that many studies targeted a single control measure, rather than all NI components, as it was difficult to cover given their educational methods. The gaps in knowledge consist of a lack of nursing education regarding NI control measures. Previous studies mentioned the lack of diversity with the use of different NI control measures. For example, many educational modules only focused on hand-hygiene as preventative means. Three-year Yemeni nursing programs were unable to implement infection control measures within their curriculums, resulting in a lack of knowledge regarding infection control. Therefore, this study aimed to bridge this gap in knowledge by integrating a needs-based educational module and evaluating its effectiveness with a three-group randomized control trial (RCT).  | /9  |
| **Sampling:** Was the study population described?ÿ Yes ÿ No Were inclusion and exclusion criteria described?ÿ Yes ÿ No Was sample size justified and adequate?ÿ Yes ÿ No Was informed consent obtained?ÿ Yes ÿ No ÿ Not addressedWere participants a vulnerable population?ÿ Yes ÿ No | Describe the sampling methods used. Was the sampling method appropriate to the study purpose, research question and/or hypotheses? Is there an adequate description of the final sample? How was participant harm minimized? Did the benefits of the study outweigh the potential risks? This study conducted a randomised hospital-based trial to evaluate Yemeni nurses, of both genders. This study was dedicated to public hospitals and nurses with a three-year nursing diploma and was located in one region in the north Republic of Yemen. The sampling method is appropriate for the study purpose because randomising the groups ensures fairness. The researchers first chose eight hospitals to ensure a variety of nurses with varying experiences. This is also appropriate for the purpose statement because the experiment was only conducted on Yemeni nurses; thus, any foreign nurses were excluded. To narrow down the samples, there were two steps involved. First, they chose five cities and eight public hospitals within those cities. They did a random draw to select three hospitals out of the eight. In the second stage, they reduced the sample down to 540 nurses (180 nurses from each hospital). Overall, there was adequate information of the final sample. The participants’ harm was minimized by obtaining their informed consent before conducting the study. Aside from obtaining their consent, there was no other information that discussed risk minimization; however, it was mentioned that the control group was given access to the educational modules after the completion of the study to offer them the same opportunity of increased knowledge on NI control. Due to no risks being mentioned, the benefit of the study outweighs the potential risk. By conducting the research, the effectiveness of educational module on NIs were evaluated.  | /12  |
| **Data Collection:** Methods used:ÿ Questionnaires/Scalesÿ Observationsÿ Interviewsÿ Chart Auditsÿ Physiological measuresWere the reliability and validity of measurement methods provided?ÿ Yes ÿ NoWere study measures pre-tested?ÿ Yes ÿ No ÿ Not addressed | What methods were used for data collection? Was the data collection methods appropriate to the study purpose and/or research question? How were variables measured and were measures appropriate for the study design? Explain your rationale. Researchers utilized a self-administered NI control measures-evaluation questionnaire in order to collect data from the participants. Data was collected from the three groups of participants at three different periods of the study. Pre-evaluation data was collected prior to conducting the intervention and providing educational materials to participants. Post-evaluation data was collected directly after the intervention, while follow-up evaluation data was collected three months after the completion of the intervention. To avoid the exchange of information between participants, data was collected on the same day the questionnaire was distributed. These methods of data collection assisted in the establishment of a baseline (pre-intervention) of what the participants’ knowledge level was, while also assessing if the level of knowledge among the participants’ increased as evidenced by their progress throughout the three stages of data collection. If the level of knowledge amongst the participants increased, it would mean the educational module was effective which would further establish a sense of appropriateness to the study purpose. The researchers detailed how the level of knowledge was measured which was using a questionnaire that quizzed participants using closed-ended questions and gave them a numeric score (1-30 for knowledge and 1-15 for practice responses). The higher the score, the more knowledge the nurse had on NI control; thus, giving the researchers an operational measurement for knowledge that could be used to observe changes. | /9  |
| **Data Analysis:** Are data analysis methods described clearly and adequately?ÿ Yes ÿ No Is there evidence that data were screened and treated prior to analysis?ÿ Yes ÿ No Are there tables or figures to support the text?ÿ Yes ÿ No | Describe the methods of data analysis. Were the methods appropriate for addressing the study purpose, research question and/or hypotheses? Are the analysis methods used appropriate for the levels of measurement? The methods used to analyze data from the study purpose were clearly identified. The Statistical Package for Social Sciences (SPSS) 22.0 was utilized in order to clean, enter, check, and examine the data that was collected. The difference between the groups at baseline was tested using a Chi-square test and a Kruskal-Wallis test (non-parametric tests). For all repeated-measures analysis, the generalised estimating equation (GEE) was employed, with each group as the between-subjects factor and time as the within-subjects factor, and the preceding training course and past experience as covariates. The Wald Chi-Square test was used to investigate the time, group, and interaction effects, as well as to estimate the research variables' mean scores across time. Whenever a significant interaction effect was discovered, a simple main effects test was carried out. To analyse variations between the group effect and the within group effect over time, a post-hoc analysis was done.  These methods of data analysis were appropriate for the study purpose as the researchers were able analyze and examine the collected data. This was done to prove that there was a significant difference in knowledge between the three groups, as evidenced by the P-value of 0.5. The group that had both, the educational modules and training, had the biggest increase in knowledge followed by the group that only received the educational modules (confirming that the independent variable has an effect on the dependant variable).  The analysis methods used are appropriate for the levels of measurement. Nominal and ordinal levels of measurements were used throughout the study. The Kruskal-Wallis test was utilized in order to examine nominal aspects of the study. The test showed no statistically notable dissimilarity in the Mean ranks between groups in relation to their age. The Chi-square test was able to analyze nominal and ordinal data, given that no statistically notable dissimilarity with the groups’ gender, previous working experience, previous in-service training, and the date of the last training course attended was noted. | /8 |
| **Overall Rigour:**Are there indicators of threats to:Internal validity ÿYes ÿNoExternal validity ÿYes ÿNo | How did the researcher(s) attempt to ensure credibility of the research? Give an example for each.The researchers noted that they tested construct validity by using a pilot study which used a smaller sample size. To assess the content validity, the questionnaire was reviewed by an expert panel who made recommendations for edits. Cronbach’s alpha proved the instrument’s reliability through the acceptable results of 0.81 for the knowledge section and 0.79 for the practice section. The tests performed in the data analysis portion proved that it was the educational module (independent variable) that influenced the knowledge (dependant variable), instead of other factors like demographics. The authors mentioned that the results may not be generalized for use in other settings because the study only used public hospitals in north Yemen.To ensure overall credibility, a pre-test was conducted with 20 nurses who had not been participating in the study to assess whether questions were understandable or not.  | /4  |
| **Implications:** Were the implications for nursing practice clearly stated?ÿ Yes ÿ No | Describe the implications for nursing practice, management, research and/or education. What did you learn from the study and how might you apply it to your future practice/studies?One implication for nursing practice includes complying with infection control measures. This would consist of understanding and promoting patient education, hand hygiene, medical-surgical asepsis, isolation status, and sterilisation. There is a blatant lack of knowledge amongst nurses regarding NIs; therefore, implementing monthly in-service training courses can allow nurses to gain a greater sense of understanding regarding infection control measures within the hospital setting. This may be applied to reduce the frequency of NIs. In future studies, it is also important to incorporate NI control measures within nursing courses in order to give a better background understanding prior to entering the hospital setting. | /5  |
| **Conclusions:** Were all important results discussed?ÿ Yes ÿ NoWere conclusions appropriate given the findings?ÿ Yes ÿ NoWere study limitations described?ÿ Yes ÿ No | Did the results support the conclusions of the study? Were all important findings discussed? Did the researcher(s) generalize the findings appropriately? Explain your rationales. What were the limitations of the study? Provide recommendations to improve the article. All important findings were discussed including limitations and future recommendations. The researchers generalized the findings appropriately within the conclusion. They concluded that intervention 1 (module and training) had the greatest result of increasing knowledge and practice of NI control for the participants, and that it should be implemented in various settings including health sciences’ curricula. They also noted that intervention 2 (modules only) also had a positive outcome. The result of intervention 1 having the largest increase of knowledge supports the conclusion of the study that it is the best method to utilize.The main limitation of the article was that it only included select public hospitals in North Yemen as the setting and only nurses with three-year diplomas for the sample. This limitation means it can be more difficult to generalize the findings to nursing as a whole. A recommendation to improve this would be to broaden the sample size and setting to include various types of nurses in different care settings and other hospitals. | /11 |
| APA  | Overall writing is clear and succinct, and language is consistent throughout. Good spelling, punctuation and grammar. Reference(s) in proper APA format.  | /5  |

**Total: /70**

**Participation Statement:**
I acknowledge that I participated equally with the members of my group in completing this activity.

**Names of Group Members (print):**

Reem Boudali

Sukie Chaggar

Alaa Elourfali

Joanne Ta

**Signatures:**



|  |
| --- |
|  |
|  |

**References**

Alrubaiee, G. G., Baharom, A., Faisal, I., Shahar, H. K., Daud, S. M., & Basaleem, H. O. (2021). Implementation of an educational module on nosocomial infection control measures: A randomised hospital-based trial. *BMC Nursing,* *20*(1), 1-10. https://doi.org/10.1186/s12912-021-00551-0

Samuel, S., Kayode, O., Musa, O., Nwigwe, G., Aboderin, A., Salami, T., & Taiwo, S. (2010). Nosocomial infections and the challenges of control in developing countries. *African Journal of Clinical and Experimental Microbiology, 11*(2), 102–110. doi:10.4314/ajcem.v11i2.53916