

A Virtual Issue on Quantitative Methods

This second virtual issue of *Research in Nursing & Health*, as a parallel issue to the first qualitative compendium, focuses on quantitative articles. The eleven full articles and one editorial included here are the most frequently referenced quantitative oriented manuscripts in our archives. They focus on three major themes: instrument development methods, statistical analysis decisions, and intervention studies. The oldest, at over a dozen years in age (Grant & Davis, 1997), continues to wear well. The most recent ones, published within the past year (Becker, 2008; Hertzog, 2008) have clearly made a contribution already to our quantitative thinking and publishing.

The first group of articles, those on instrument development, inform preparation for measurement and helps establish the foundation for accurate data collection. As others and I have noted frequently (Froman, 2009), the quality of measurement, particularly the balance between truth and error, reverberates throughout research studies. Grant and Davis (1997) were not the first to write about the use of a panel of experts in the assessment of content validity, but they described that process of validation with such simple clarity that the manuscript has helped many other researchers apply content validation estimation in a painless fashion. Subsequent articles on the topic of content validation (Polit & Beck, 2006; Polit, Beck & Owen, 2007) delve into the process more deeply and explore some of the intricacies and complexities of the content validity index (CVI). The final article in the instrument development group addresses one of the most common self-report formats, the Likert-type rating scale (Lee, Jones, Mineyama, & Zhang, 2002) and alerts us to where error and cultural bias can creep into measurement. Taken as a set of articles, these manuscripts provide a primer for planning and decision making in approaching validity of measurement instruments.

After deciding on a measuring tool and starting data collection, we are faced with deciding the quantity of data needed for trustworthy decision making, and then how to treat and analyze data. The second grouping of articles, those on statistical analysis decisions, help here. First, Hertzog (2008) provides considerations in calculating the sample size needed for pilot studies, a different consideration than merely calculating power. After actual data collection we often face the common problem of missing data in a data set. Fox-Wasylyshyn and El-Masri (2005) offer sensible recommendations for practical means to approach those holes in data sets. Then there is the issue of which of myriad statistical approaches to employ in the actual analysis

of data. In statistical analysis there are always multiple ways to skin cats, and all skinning methods do not yield the same results. Two articles by Owen and Froman, (1998; 2005) compare results of selecting and applying different statistical methods to the same data set. The article by Bennett (2000) explains the connection between model testing and statistical analysis when exploring mediator and moderator variables.

The last grouping of frequently cited quantitative articles, that covering intervention studies, is practical in nature. Lauver and colleagues (2002) provide a useful description of patient centered interventions as an increasingly common approach to nursing research. Conn and colleagues (2001) offer tips and guidelines for designing effective interventions. Becker's editorial (2008) wraps up the package by offering recommendations for what types of intervention studies comprise publishable manuscripts and why we should be interested in them.

We hope you will find this a useful tool box of articles for your current or future quantitative projects. Others have successfully used these references in their own publications as evidenced in the frequency of their citation.

References

- Becker, P. T. (2008). Publishing pilot intervention studies, *Research in Nursing & Health, 31*, 1-3.
- Bennett, J. A. (2000). Mediator and moderator variables in nursing research: Conceptual and statistical differences, *Research in Nursing & Health, 23*, 415-420.
- Conn, V. S., Rantz, M. J., Wipke-Tevis, D. D., & Maas, M. L. (2001). Designing effective nursing interventions, *Research in Nursing & Health, 24*, 433-442
- Fox-Wasylyshyn, S. M. & El-Masri, M. M. (2005) Handling missing data in self-report measures, *Research in Nursing & Health, 28*, 488-495
- Froman, R. D. (2009) Quality Measurement as the Cornerstone of Respectable Research, *Perioperative Nursing Clinics*, in press.
- Grant, J. S. & Davis, L. L. (1997) Selection and use of content experts for instrument development, *Research in Nursing & Health, 20*, 269-274.
- Hertzog, M. A. (2008) Considerations in determining sample size for pilot studies *Research in Nursing & Health, 31*, 180-191.
- Lauver, D. R., Ward, S. E., Heidrich, S. M., Keller, M. L., Bowers, B. J, Brennan, P. F., Kirchhoff, K. T. & Wells, T. J (2002) Patient-centered interventions, *Research in Nursing & Health, 25*, 246-255
- Lee, J. W., Jones, P. S., Mineyama, Y. & Zhang, X. E. (2002) Cultural differences in responses to a Likert scale, *Research in Nursing & Health, 25*, 295-306
- Owen, S. V. & Froman, R. D. (1998) Uses and abuses of the analysis of covariance, *Research in Nursing & Health, 21*, 557-562
- Owen, S. V. & Froman, R. D. (2005) Why carve up your continuous data? *Research in Nursing & Health, 28*, 496-503
- Polit, D. F. & Beck, C. T. (2006) The content validity index: Are you sure you know what's being reported? critique and recommendations, *Research in Nursing & Health, 29*, 489-497
- Polit, D. F., Beck, C. T. & Owen, S. V. (2007) Is the CVI an acceptable indicator of content validity? Appraisal and recommendations, *Research in Nursing & Health, 30*, 459-467