The impact of major illnesses and surgeries on everyday life is not as often considered in research as is the physiology of those illnesses. It is important that quality of life related to illness and treatment is factored into the evidence base so that patients may make health care choices based on all available information concerning particular treatment options. Addressing the impact of serious illness on quality of life is worthy of nurse clinicians’ time and consideration to discover how nursing practice might change as a result of listening to a patient tell his story about the impact of treatment. That is the focus of the current research and review that will consider whether the results are strong enough to be added to the evidence base.

Critique

Many of the studies available on prostate cancer treatment, as noted by the authors in the literature review (Ward-Smith & Mehl, 2007), are retrospective in nature and often have survival or death as endpoints of research rather than examining the possibility that one can live life with quality as an outcome of a specific treatment. The researchers have determined, through reviewing past research, that quality of life is also an appropriate outcome of study. This study offers a prospective look at quality of life after a treatment decision was made. No influence or pressure was placed on the individuals to make certain treatment decisions so that research could be conducted, thus, contributing to a very ethical research study.

The current study is a well-designed, internally valid survey design of clients who have made a decision about a type of treatment for prostate cancer. As is often the case in published research reports, the research question or hypothesis was stated in the purpose of the study. Survey designs are important research studies, particularly on topics such as the one in the current study. While their results do not fare as well on rating scales of scientific evidence, they are important for gathering large amounts of data on topics that are not so well known in the research literature and amenable to questionnaire or interview data collection.

The literature review revealed that quality of life has been studied for other prostate cancer treatments but less for prostatectomy, creating the need for the current study. One of the benefits of a literature review that often happens is the discovery of an appropriate instrument for data collection, in this case the Functional Assessment of Cancer – Prostate (FACT-P). The current researchers had used the tool in prior research data collection. All aspects of methodology were included, such as an institutional review board (IRB), study participant inclusion/exclusion criteria, confidentiality, sampling, and appropriate statistical procedures. Definitions of the variables are included. However, one must assume that the definition of “quality of life” is consistent with that of the instrument chosen for data collection.

Since the majority of the study design quality has been noted, the remainder of this review can focus on four specific aspects of the design to which researchers gave special attention – power analysis, instrument reliability and validity, missing data and replacement values, and clinical and statistical significance. Each supports the internal validity of the study as well as the credibility of the study results. Although more commonly found in nursing studies, power analysis is not always found in published research reports.

The power of a study is its ability to detect true relationships or differences in study variables. It is directly related to sample size and helps to avoid false-positive or negative conclusions when addressed in the design of a research study. Also included in the discussion of power is effect size and level of significance. Most research texts include a table that provides an estimate of sample size.
size that is needed to achieve the desired power once the power, effect size (strength of relationships), and level of significance are chosen by the researcher. If the researchers achieve the sample size suggested, theoretically, they have achieved the desired study power, or risk committing a Type II error. Then, the likelihood of achieving significance, rejecting the null hypothesis, and avoiding error is possible (Polit & Beck, 2008). In this study, the researchers determined that to achieve a moderate effect that is 0.5 or less, at the 0.05 level of significance, provides the study results with a power of 0.8, meaning they are willing to take a 20% risk of committing the Type II error because achieving a larger sample size may not be feasible.

The previous discussion means that achieving the sample size is essential to the possibility of achieving study findings that have the greatest possibility of being true and avoiding error. In the current study, the researchers needed 54 participants according to their power analysis. In their convenience sample, which took 20 months to complete, they had 56 participants, or slightly above their recommended sample size. Thus, they achieved the study power necessary to find true differences in quality of life before and after prostate cancer treatment with a radical prostatectomy. Possible reasons why the researchers did not achieve statistical significance are discussed below.

Polit and Beck (2008) state that many nursing studies are underpowered. While it is likely that many are studies that are seeking new relationships or differences and typically have lower power, another reason may be that the researchers do not give enough credibility to background information that suggests strong relationships and would support a more powerful study. Since the current study is forging new territory with examining quality of life pre- and post-prostatectomy, the power assigned by the researchers is very reasonable.

Once methodological considerations of power analysis are complete, researchers can begin identification of data collection instrument and process of collecting the data. The FACT-P is a Likert-type scale, a questionnaire that is a very popular self-report research instrument. The specific scale has been used previously by the current researchers as well as validated by researchers who are credited in the section on Instruments. Questionnaires are widely used methods for data collection, and given care in structuring the questions and appropriate testing and refinement of the instrument, they can be a very reliable and valid way to collect data.

One concern with self-report instruments is whether respondents are honest in their responses such that the questionnaire provides a fair representation of the variable being studied. Another concern is the consistency with which the scale derives information. Alpha coefficient reports on the subscales and aggregate scores on the FACT-P range from 0.61 to 0.97. The highest possible alpha score is 1.00 and the current study produced an alpha coefficient of 0.70. Higher alpha scores indicate internally consistent and reliable instruments and offer researchers and other clinicians confidence that the data collected will produce information to support innovation in practice. Although 0.70 is an average score, it is also one that is not unusual in new areas of research. A very acceptable coefficient for this current study, it suggests that the items on the instrument are measuring the intent of the scale. It may also reflect the homogeneity of the sample population that tends to produce lower alpha coefficients. How an instrument is administered as well as the original population with whom it was developed affect an instrument’s reliability.

Another issue in the use of self-report instruments is missing data when respondents choose not to answer certain questions. Researchers must then make decisions about how to manage very valuable data on an instrument with missing data. Missing data create difficulties with statistical analysis. Thus, consideration of deleting an entire participant’s response or substituting appropriate values for the missing data must be given. There are numerous methods that researchers can use to substitute data. Among them are mean substitution, case substitution, or regression analysis that predicts the value of the missing data (Polit & Beck, 2008). The current researchers used a regression technique that is relatively more accurate than either mean or case substitution and avoids the need to eliminate an entire subject from the data analysis. Missing data in the current study was very small. However, using a substitution technique allowed the researchers to maintain the integrity of their sample size without compromising legitimacy of the data.

Finally, the topic of statistical significance versus clinical significance is considered by the researchers and this reviewer. While the researchers were not able to reject their null hypothesis, they posit clinical significance, which is important. Many clinicians who work with patients before and after radical prostatectomy might expect changes in quality of life. The researchers did, however, achieve significance on two subscales (social well-being and prostate concerns), whose scores declined over the time of measurement. Even though the quality of life as a whole does not show differences before and after surgery, some specific factors do. That may give clinicians some beginning information to address the issue with patients. One wonders if a larger sample size would have helped to achieve statistical significance in this new area of research. It is the hope of this reviewer that the researchers would consider replication of the study, not only with a larger sample size, but also one that is more diverse to reflect the larger population of those who have prostate cancer and need to make treatment decisions.

Application to Evidence Base

The Melnyk and Fineout-Overholt (2005) rating hierarchy places this research at Level VI of a seven-
level hierarchy of evidence in its ability to contribute to the evidence base. It is the opinion of this reviewer that the internal validity of the study was sound and that the significance that it did find should contribute to the evidence base. While clinicians may not be ready to put quality of life on the table as an option in lieu of treatment for prostate cancer until further research is complete, given replication of this study and subsequent studies, it may become an option to consider. It should be included in educational information given to clients so they anticipate life changes that may occur following surgical intervention for prostate cancer.

References

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