Researchers have spent decades trying to answer the question: Does more nurse staff lead to better quality of nursing home care? Many nurses, consumers, nursing home providers, and other stakeholders believe intuitively that the answer is “yes.” Yet, the research literature fails to give us a clear answer. Bostick and colleagues1 reached a relatively positive conclusion about the nurse staffing and quality relationship from their review of 87 articles and reports published from 1975 to 2003. Spilsbury and colleagues,2 in their systematic review of 50 carefully screened studies from 1987 to 2008, were much more critical of methods and findings from these studies. In this issue of the Journal, Backhaus and colleagues3 offer a systematic review of more recent research, with most of the reviewed studies conducted between 2000 and 2012. They limited their review to studies using a longitudinal design, which is better able to detect causal effects and less susceptible to spurious interpretation than a cross-sectional design. Backhaus and colleagues3 assessed the strength of the study design, generalizability, control variables, and other issues, and they examined studies from different angles: staffing level and skill mix; different care processes and outcomes; and resident, facility, and multiple levels of measurement and analysis. Echoing the conclusions reached by Spilsbury and colleagues,2 they found “no consistent evidence for a positive relationship between staffing and quality,” and “major methodological and theoretical weaknesses limit the interpretation of findings” from these studies.

Our purpose in this editorial was to expand on the conceptual and methodological issues raised by Backhaus and colleagues3 and to suggest research directions that can help better understand the relationships between staffing and nursing home quality.

**Conceptual Issues**

A major weakness of prior research is the absence of a clear and comprehensive conceptual framework, a framework that places the question of nurse staffing and quality into a larger organizational context. In nearly all the studies on nurse staffing and quality, the variable of nurse staffing is narrowly defined.2 Specifically, nurse staffing is conceptualized as the number (nursing hours per resident day or full-time equivalents) and type of nursing staff (registered nurses [RNs], licensed practical/vocational nurses [LPNs/VNs], nursing assistants [NAs], licensed nursing staff, total nursing staff). It makes sense to focus on the number and type of nursing staff because most staff in a nursing home is nursing staff; however, nurse staffing is a multidimensional construct that includes both structure and process variables (Table 1).

The required number and type of nursing staff are determined by the needs of the residents. Residents with more complex needs or conditions that are not stable will require more care time from RNs, whereas residents whose conditions remain stable on a daily basis need mainly assistance with activities of daily living may require more care time from NAs. Some studies adjust for case mix when examining the relationship between nurse staffing and quality of care; however, most of these studies simply treat case mix as a statistical control variable to obtain the net effect of staffing adjusted for types of residents receiving care. Resident case mix may have a more complex relationship to both staffing and quality. Increased staffing level may have its desired effect in meeting resident needs when it is combined with structural characteristics of the nursing staff, such as the amount of experience; education background, both academic and continuing education; and professional certification, such as gerontological nursing or rehabilitation. As resident acuity increases, these structural characteristics are likely to have a greater influence on clinical outcomes.

Process variables that make up the construct of nurse staffing may be the most powerful variables to influence quality of care. Simply having a certain number of nursing staff does not guarantee that residents will receive quality care. Attention should focus on how to effectively allocate and use the available nursing staff: how they are scheduled; how work assignments are allocated, including the extent to which a resident is assigned to the same nursing staff on a consistent basis; and how, when, and what type of information is shared among nursing and other staff regarding the care needs of residents. The degree of formal and informal connections between RNs and LPNs around assessment, care planning, delegation, and supervision can differentiate the quality of care in nursing homes.7

Two process variables in Table 1 focus on the role of the RN. The accountability of the RN for the assessment, care planning, and evaluation of residents’ care may be one of the more crucial nurse staffing variables. The RN has the expertise and the accountability for meeting the professional nursing care needs of residents. The second variable specific to the RN role is supervision of the nursing care provided by other nursing staff (LPNs and NAs). Although quality of
care and the number of RNs or RN ratio have been studied, utilization of the role of the RN in nursing homes has not been examined for its relationship to quality care.

Other contextual factors may also influence the nurse staffing/quality relationship. For example, if the supply of RNs in a region is in great demand, recruiting and retaining RNs in a nursing home will provide challenges in addressing the staffing variables of RN accountability and supervision. Interchangeability of RNs and LPNs is a common practice in nursing homes, with evidence that such practice has a negative impact on the quality of care.7

Another contextual variable is the physical layout of the nursing home (eg, long hallways; location of the supplies, medications, and equipment) and the availability of mechanisms to support effective communication (eg, nurse call system, accessibility of telephones, electronic health record). Other factors identified by directors of nursing having an impact on nurse staffing included such things as support staff to assist with transporting and assisting residents to eat, staff absenteeism, and policies and procedures related to scheduling staff.4 Corazzini et al4 found that how boards of nursing regulate the scope of practice for LPNs is related to care quality in nursing homes.

Methodological Considerations

These complex relationships between staffing quality and organizational context are not easily studied empirically. Research must be grounded in a clear conceptual framework with testable hypotheses. To test these hypotheses, researchers have to overcome methodological challenges, such as those described by Bachhaus and colleagues.3 They highlight the distinction between process and outcome measures of quality and the importance of assessing the sensitivity of each to staffing. Although most studies in their review use multiple measures of processes and outcomes, they rarely link process to outcome. If higher staffing results in better care processes, do these care processes result in better outcomes? The mediating effect of care processes should be specified and tested. Also, certain types of residents may benefit more from improved care processes than others. For example, in a cross-sectional study of falls among nursing home residents, there was greater risk for falls among residents with cognitive impairment and behavior problems.2 Fall risk was heightened by inappropriate use of antipsychotics, physical restraints, and other poor care practices. Study designs should focus on the effects of staffing on process-outcome relationships that are clinically meaningful, and they should specify and test both mediating and moderating effects.

Another important distinction is between clinical processes and outcomes versus those related to quality of life. Ideally, a study design would take both types of outcomes into account; however, they may require different measurement approaches. Data on clinical processes and outcomes may be obtained from secondary sources, such as clinical records, whereas quality of life may necessitate primary data collection. In addition, sampling strategies may differ both in the selection of residents (eg, short or long stay) and organizational characteristics (eg, traditional nursing homes or facilities undergoing culture change).

Just as care processes and outcomes come in different forms, so do the capabilities of staff members, the roles they play, and the tasks they perform. As we have suggested, a well-designed study should take these factors into account, as well as more general organizational characteristics. To capture interactions among organizational context, staffing, care processes, and outcomes, the study design should have measurement and analysis at multiple levels. Bachhaus and colleagues3 considered the level(s) of the study when assessing its quality. Ten of the studies examined staffing and quality relationships solely at the facility level by correlating a facility’s staffing with care-related regulatory deficiencies or aggregated clinical outcomes. Reliance on aggregated data runs the risk of an ecological fallacy in which a potentially invalid inference is drawn from the characteristics of facilities to the care provided to individuals within them. The other 10 studies had facility- or nursing unit–level measures of staffing, but outcomes were measured at the resident level. Ultimately, it is the amount of nursing effort directed to individual residents in conjunction with structural and process factors that will influence their outcomes. Only one study attempted to capture the individual receipt of care, as well as aggregate staffing levels on the unit.10

Another research challenge is the potential for reciprocal effects among the acuity of residents, level or skill mix of staffing, and care outcomes. Most studies have treated resident acuity as an exogenous variable in which the staffing-quality relationship is tested after controlling for resident acuity, often measured by dependency in activities of daily living, cognitive impairment, or other clinical conditions. However, it is difficult to separate these measures of resident acuity from care quality. If poor quality of care results in functional or cognitive decline, skin breakdown, weight loss, or other negative health or functional outcomes, this would likely increase resident

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Table 1

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<th>Construct of Nurse Staffing</th>
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<tr>
<td><strong>Nurse Staffing Variables and Definitions</strong></td>
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<tr>
<td>Structure</td>
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<td>No. of nursing staff</td>
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FTE, full-time equivalent; HPRD, hours per resident day; LP/VN, licensed practical/vocation nurse; NA, nursing assistant; RN, registered nurse.
acuity. The facility may very well increase its staffing in response. This situation may help explain the apparently paradoxical finding where some studies found that higher staffing levels or RN or licensed staff ratios were associated with poorer care.

Another issue raised by Backhaus and colleagues\(^1\) is the potential for nonlinearity between staffing and quality. This issue has an important bearing on debate over staffing standards. Empirical studies should assist in establishing staffing thresholds. If levels of staffing were below a particular point, we would expect serious quality problems. This threshold could be used to set minimum standards. Increases in staffing above this threshold might be associated with significant quality gains. Then, at some point, increases in staffing would have a diminishing return. The point of inflection when quality gains diminish could be used to set an optimum staffing standard. Determining a dose-response relationship between staffing and quality would have considerable practical value for management of staffing resources. However, given the myriad of factors at play in the relationship between staffing and quality, finding these empirical relationships or establishing clear-cut staffing minimums or optimum staffing levels would be very difficult.

Backhaus and colleagues\(^2\) advocate for longitudinal designs as being better suited for assessing causal effects of staffing on quality than a cross-sectional design. A randomized controlled trial of staffing and quality would be ideal; however, it would be very complicated to design and it could be enormously expensive. Some longitudinal designs are stronger than others. Some of the studies they reviewed were longitudinal in the sense that staffing was measured at one point in time, whereas quality was measured at a subsequent point. Other studies involved repeated measures where the staffing and quality relationship was observed at different points in time, with some using sophisticated panel designs and analysis.\(^3\)

None of the studies had predefined treatment and comparison groups, where staffing levels were systematically manipulated to assess their effect on quality. Simply measuring staffing and quality at different points in time in a population of facilities makes it difficult to sort out causality among staffing, acuity, and care quality. It would be better to find a situation that approached a quasi-experiment where staffing was increased systematically across a large sample of facilities. Such a situation might occur, for example, with a change in Medicare or Medicaid reimbursement for direct care, introduction of higher staffing standards, staffing incentives built into a pay-for-performance program, or resource reallocation decision by a nursing home corporation. In any case, it will be challenging to find opportunities for longitudinal studies that effectively test causal relationships between staffing and quality.

**Conclusions**

Further research focused narrowly on the relationship between staffing and quality, with all its conceptual dimensions, is unlikely to give us a definitive answer. Perhaps we are posing the wrong question. Shouldn’t we be asking: How can we achieve better-quality nursing home care? And, how does the construct of staffing contribute to this goal?

**References**