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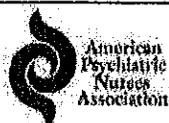
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What is This?



APNA Position Statement: Staffing Inpatient Psychiatric Units

Introduction

In 2004 there were 1.8 million admissions to general hospitals for mental health and substance abuse issues (AHRQ, 2007). On the basis of admission criteria, these patients are among the sickest and most vulnerable of mentally ill individuals. Registered nurses (RNs) maintain 24-hour accountability for all aspects of inpatient care, particularly in organizing conditions for healing, reengagement with recovery, and the safety of patients and staff.

Ensuring proper RN staffing levels on inpatient psychiatric-mental health units is vital given the increasing severity of illness of hospitalized mental health patients and the mounting evidence that nurse staffing levels influence outcomes. The risk for adverse outcomes rises as the ratio of patients to nursing staff increases.

Therefore, the American Psychiatric Nurses Association (APNA), as the largest professional organization representing psychiatric nurses, convened a work group to make recommendations for determining staffing needs of inpatient psychiatric units that will protect the quality of care and the safety of both patients and staff. This position paper details the group's findings and recommendations based on a comprehensive review of the literature.

Discussion

Quality and safety

In the last 10 years there has been intense national interest in patient safety and the quality of hospital care (AHQR, 2006; Hughes, 2008; IOM, 2001; Page, 2004). A parallel trajectory has established the relationship between nurse staffing and hospital quality/safety (Kane, Shamliyan, Mueller, Duval, & Wilt, 2007; Stanton & Rutherford, 2004; Unruh, 2008). Industry leaders have concluded that registered nurses are critical to the quality of nursing care (Needleman & Hassmiller, 2009) and that higher nurse staffing protects patients from poor outcomes (Blegen, Goode, Spetz, Vaughn, & Park, 2011). This research has benefited from the growing consensus on indicators of quality that are sensitive to nursing care and related to nursing staff levels (National Quality Forum, 2004, 2009). Across all hospital settings, research

is mounting that substantiates the relationship between nurse staffing levels and specific quality indicators such as lower rates of infection, shorter lengths of stay, and lower rates of "failure to rescue" (Needleman et al., 2011; Needleman, Buerhaus, Mattke, Stewart, & Zelevinsky, 2002). Although there are patient-centered indicators on the list that span hospital specialties, the only indicator that has some specificity to psychiatric nursing is restraint prevalence.

Psychiatric nurses are concerned about safety and quality (Fetter, 2009). However, experts agree that there is a "thin" amount of work in the area of psychiatric inpatient care and nurse staffing (Clarke & Donaldson, 2008), particularly in the area of how to measure staffing, isolate outcomes, and link the two variables. Psychiatric clinicians have forwarded sound ideas on the elements of high-quality mental health care, and several apply to inpatient treatment: patient-centeredness, the experience of care, recovery practices, shared decision making, and self-management (Pincus, Spaeth-Ruble, & Watkins, 2011). The Hospital-Based Inpatient Psychiatric Services Core Measures also inform nursing on elements of inpatient quality. Drawing upon national frameworks for measuring staffing levels, particularly systems using shift target levels (Needleman et al., 2011), creates the roadmap for psychiatric inpatient quality and staffing that should be useful in the future for designing studies of staffing effectiveness on psychiatric inpatient units.

Factors that influence staffing

Studies show that multiple variables affect staffing needs besides the number of patients. Variables include acuity and multimorbidity, patient flow on each shift (number of admissions, discharges, transfers, and procedures), education and experience of RNs, nursing skill mix, nurse workload, unit physical environment, technology, care delivery model, and finances. These factors influence outcomes for patients, staff, and hospitals.

Acuity. Aligning staffing based on patient needs and acuity is an important consideration for risk mitigation and safety on the unit (Delaney & Johnson, 2006). Patient acuity is determined at the unit level by evaluating the

patient's status against defined criteria or patient attributes—factors that have historically required higher or lower levels of care. The impact of patient acuity on staffing needs also varies according to unit flow (admissions and discharges), unit location, and unit function. Patient acuity is not static but must be reevaluated routinely throughout the shift to ensure that staffing is appropriate to meet the needs of the patient population.

Recognizing the growing impact of patient acuity on adequate staffing, many organizations have used Medicare's case mix index (average diagnosis-related group relative weight for that hospital) to assist in predicting patient acuity. Unfortunately, case mix index is more medically focused and does not provide an accurate depiction of nursing care needs for each patient or aggregate. The use of nursing intensity weights likely provides a clearer picture of nursing care needs but is not yet a nationally accepted standard for determining acuity-based staffing needs (Mark & Harless, 2011).

In an environment with increased regulatory demands, nursing is challenged with balancing current staffing models, acuity tools for effectiveness, and quality patient outcomes. To date, there is no standardized acuity tool available for behavioral health units. Though they have added core measures for screening for suicide and risk of violence, nursing managers and researchers have relied on using Medicare case mix index or adapting acuity instruments similar to those used on medical units (Grantham, 2010; Mark & Harless, 2011). The American Nurses Credentialing Center (ANCC) Magnet Recognition program has developed a framework emphasizing the importance of empowering nurses to practice autonomously in a shared governance model (ANCC, 2011). The lack of an acuity measure that accurately depicts psychiatric nursing care needs according to patient acuity hampers the work of staff nurses, particularly in meeting their responsibility to adapt care based on the acuity of their patient.

However, adjusting staffing for patients with varying severity of symptoms is critical to safety and quality outcomes. Staffing must be flexible to match staff competence with patient needs.

Multimorbidity. Another patient characteristic that affects staffing needs is comorbidity or multimorbidity. Collectively, available evidence suggests that patients on psychiatric units have multiple and complex physical and mental health problems that require the attention of an RN (Druss & Reisinger Walker, 2011; Kronick, Bella, & Gilmer, 2009; Safford, Allison, & Kiefe, 2007; Valderas, Starfield, Sibbald, Salisbury, & Roland, 2009). A main determinant of patient outcomes from psychiatric hospitalizations is the type of patient who is admitted and the type of psychiatric facility that delivers the care (Cromwell & Maier, 2006). In 2002, 1.6 million Americans aged 18 years and older were hospitalized for a psychiatric condition, for a total of 2.2 million psychiatric admissions

(OAS, 2005; National Center for Health Statistics, 2006). These are predominately older individuals. Four of five individuals had previously been admitted, and one in eight had 11 prior hospitalizations to psychiatric facilities (Fries et al., 2006). Additionally, compared with the general population, persons with severe mental illness have a life expectancy that is 25 years less and have 1.5 to 2 times higher prevalence of diabetes, dyslipidemia, hypertension, and obesity (Newcomer & Hennekens, 2007; Miller, Paschall, & Svendsen, 2006). Higher rates of cigarette smoking, alcohol and drug abuse, poor diet and exercise habits are present in individuals who have psychiatric disorders. Thus, the complexity of the psychiatric inpatient population has greatly increased, requiring a more holistic approach and a focus on the medical as well as the psychological needs of the individual. The RN, by virtue of training and 24-hour staffing, is the discipline best equipped to provide this care on inpatient units.

The ability of psychiatric care units to provide effective hospitalizations for sick patients is critical to prevent harm by patients to themselves or others and to treat the acute phases of severe mental illness and substance abuse disorders. Continued exploration of how nurse staffing models affect patient outcomes can lead to positive organizational changes that result in safe and effective inpatient psychiatric hospitalizations and improved patient outcomes.

Throughput. A recent retrospective observational study also found that throughput, or patient flow, has an impact on staffing effectiveness; there was an increase in patient mortality when nurses handled multiple admissions, discharges, and transfers during their shift (Needleman et al., 2011). The same research also demonstrated that nurses' ability to safely monitor patients decreased because of high workload and low staffing levels; the resultant reduction in surveillance correlated with an increase of mortality rates (Needleman et al., 2011).

In addition, high nurse workloads increase the risk and number of reported on-the-job injuries (back injuries, needle sticks and stress-related disability), potentially resulting in high levels of nurse burnout and increased staff turnover (Clarke & Donaldson, 2008). Balancing nursing skill, experience, and education with various patient needs further complicates formulating acuity-adjusted staffing.

Financial. Quality and safety are of utmost concern, but a nurse leader must also be aware of the financial impact that a staffing model has on the viability of the organization. Research on the impact of staffing on financial outcomes is sparse and even sparser when the focus narrows to psychiatric inpatient units. Several studies demonstrated that a greater RN-to-patient ratio resulted in a decreased length of stay (LOS) in medical-surgical units (Unruh, 2008; Thungjaroenkul, Cummings, & Embelton, 2007). These data suggest associations between staffing,

quality, and financial impact on psychiatric services. If a psychiatric unit has adequate staffing, nurses should be able to decrease the LOS and thus shorten the wait time of psychiatric patients in the emergency department (ED) and in the medical units waiting to transfer to psychiatry. This will result in opening medical and ED beds that can be filled with other patients, thus increasing hospital revenue. In addition to revenue generation, it will result in patients being admitted faster to more appropriate treatment environments.

The relationship between staffing and downstream financial benefits is an area that needs further study. Turnover is less in hospitals with a greater number of RNs to patients (Aiken, Clarke, Sloane, Sochalski, & Silber, 2002). It is estimated that replacement of an RN can exceed \$60,000 per nurse; thus by decreasing turnover, the cost of recruitment and retention is reduced.

Another issue is skill mix. A common management strategy for cost savings is to deskill the workforce. The rationale for this strategy is that nurses are more expensive and less available for hire than are mental health workers or mental health technicians. These decisions are not based on empirical indicators of quality and safety and are not supported by research. Higher numbers of RNs have been shown to decrease adverse outcomes in patients, decrease LOS, and reduce staff injuries and patient injuries, all of which result in costs savings for hospitals.

Technology. Psychiatric hospital environments are becoming increasingly complex. Multitasking is common practice as staff RNs attempt to meet the day-to-day workload demands and expectations to deliver safe, high-quality patient care. In a study of more than 200 medical-surgical patient care units across the country, direct-care RNs identified 327 workflow issues and 766 unique processes as part of nursing care delivery (Bolton, Gassert, & Cipriano, 2008). These represented eight major workflow categories: admission-discharge-transfer (ADT), communication, care delivery, medication, documentation, patient movement, management of supplies and equipment, and care coordination (Bolton et al., 2008). These authors contend that implementation of appropriate and well-designed health information technologies (IT), such as the electronic health record (EHR), can help streamline complex and redundant nursing workflow processes that will ultimately transform nursing care delivery and alleviate some nurse staffing and workload issues in the inpatient setting. However, only 56 (approximately 1%) of more than 5,000 U.S. hospitals that operate in paperless environments have achieved best-practice designation for implementation of the EHR (Healthcare Information and Management Systems Society, 2011). California hospitals in various stages of EHR implementation, report nursing care hours had actually increased by 16% to 19% in the advanced stages of implementation (Furukawa,

Raghu, & Shao, 2010). Although health policy makers and health IT experts promote the widespread adoption of EHR because of its potential benefits to improve the delivery of health services and overall quality of care (Blumenthal et al., 2008), it is imperative that hospital and psychiatric nurse administrators also value a health IT system that supports nursing care delivery. Simply put, if the EHR does not work for the nurses who provide patient care, it will not work for the patients (American Nurses Association, 2011, April). As the development of these systems moves forward, their impact on staffing, particularly increases in nursing workflow, must be considered.

Staffing plans

To ensure the provision of safe and high quality care, direct-care nurses and nurse leadership must collaborate on the development of a staffing plan. Research indicates that to reduce the frequency of negative events and/or patient mortality, these plans must be both comprehensive and flexible in setting staffing levels at the bedside (Mark & Harless, 2011; Needleman et al., 2011). When nurse leaders are developing their staffing model, they must carefully examine multiple factors in order to arrive at the appropriate staffing levels for their unit or hospital (see Appendix A). These factors include variables in patients (severity of illness, comorbidity, homogeneity of population), throughput, staff variables (educational level, experience, skill mix), and hospital factors (technology, unit design, unit age). In addition, the nurse architects of the plan must incorporate shift-to-shift variables such as number of admissions, discharges, and transfers. Balancing these variables in a staffing plan with known quality measures makes establishing any standard staffing ratio difficult.

Typically, a nurse staffing plan is used as the foundation for determining staffing needs. This is often developed annually, coinciding with the organization's budget planning process. Staff-to-patient ratios have long been utilized to establish staffing plans at the organizational level. "Nurse staffing productivity" is often measured in nursing hours per patient day. Hours per patient day (HPPD) cannot readily be used to accurately determine nurse-to-patient ratios as this measure typically reflects the average staffing across a 24-hour period. Using HPPD formulas is flawed, because factors such as staff mix (RN versus non-RN), staff competence, mix of overtime versus regular hours, and fluctuations in the patient census are not included in the calculations of this number. Additionally, not all productive nursing hours are spent providing direct care. Nurses may be engaged in activities such as education, administration, and quality assurance. Measuring HPPD will likely result in overestimation of the actual amount of bedside care (AHRQ, 2007).

What is known about nurse staffing planning comes from studies of medical-surgical nurses in general hospitals. These studies show that factors affecting nurse staffing levels include patient acuity, diagnosis, and age. Also, the skill mix of nurses and nurse's aides, level of nurses' education, and experience level of nurses are influential. Additional factors that have an impact on staffing effectiveness in psychiatric settings include the quality of support by administration for the practice of nursing and certain types of hospital characteristics such as teaching, technology utilized, and number of beds. Research on medical-surgical nurse-to-patient staffing ratios demonstrates that better nurse staffing yields better patient outcomes, including fewer deaths. Researchers have acknowledged, however, that these are often difficult data to interpret on the level of a staff ratio system (Donaldson & Shapiro, 2010; Lang, Hodge, Olson, Romano, & Kravitz, 2004).

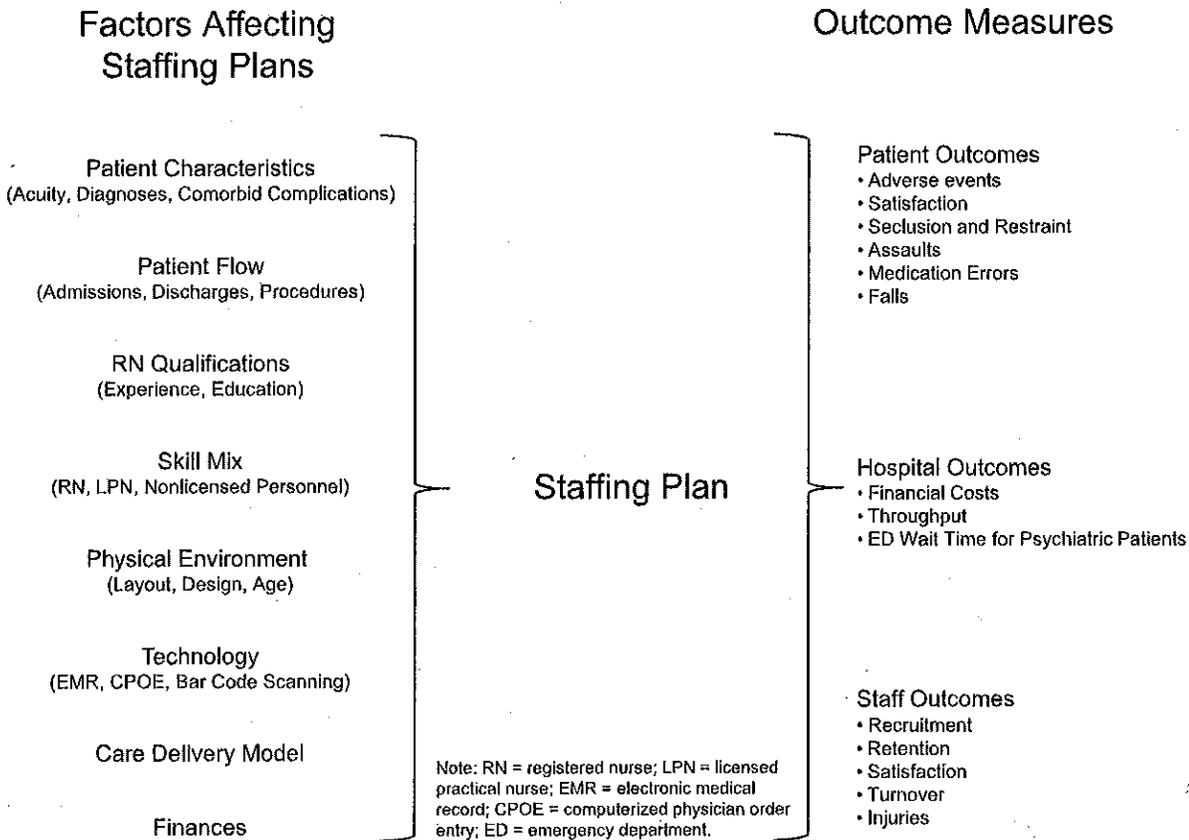
There is very little research on nursing staffing levels for psychiatric units. Researchers who have investigated the relationship between staffing numbers and effectiveness/patient outcomes on inpatient psychiatric units have concluded that the numerous variables influence any association of staffing-patient outcome (Coleman & Paul, 2001; Cromwell & Maier, 2006).

Conclusion

Multiple, complex factors influence safe staffing levels and must be considered when psychiatric-mental health nurses initiate and implement a comprehensive staffing plan. It is the position of APNA that the likelihood of adverse outcomes increases with an increase in the number of patients assigned to each nurse. With support for the role of RNs and acknowledgment that clinical outcomes are related to nurse staffing, we propose that the following recommendations be enacted for the quality and safety of care on psychiatric inpatient units:

1. Each hospital should establish a staffing committee responsible for developing, implementing, and evaluating a safe staffing plan that incorporates specific factors for ensuring quality and safety of care. The committee will have representation from direct-care RNs and nursing administrative staff.
2. For quality and safety, staffing plans will consider the multiple variables that affect staffing needs, such as psychiatric patient complexity, nursing education, nursing skill mix, physical environment, recovery principles, and the impact of technology in use. The staffing plan should allow for shift-to-shift flexible adjustments, typically based on acuity factors, or as measured by admissions, discharges, transfers, comorbidity of illness, and patient care complexity.
3. Specific quality and safety indicators will be utilized in the evaluation of the staffing plan. Hospitals may choose to use indicators such as medication errors, patient injury rates, staff injuries rates, seclusion and restraint rates, workers' compensation rates, staff recruitment/retention and staff satisfaction.
4. The methods used to establish safe staffing will be transparent (shared with all nurses in an understandable manner) and will reflect the staffing plan criteria for ongoing evaluation of whether a safe and high-quality patient experience is being maintained. Both the staffing plan and the evaluation of the plan will be made available to nursing staff.
5. Each hospital will put in place a process for examining staffing concerns that arise in the course of unit operations. Any actions from the examination process should be quickly enacted to ensure that safety and quality of care are maintained at all times.
6. Registered nurses should be trained to evaluate unit operations in line with identified quality measures as well as with data that assess organizational culture, such as the National Database of Nursing Quality Indicators (NDNQI) of the National Center for Nursing Quality (NCNQ).
7. Nurse-sensitive indicators, for use in defining and measuring the quality and safety of patient care, need to be developed further for psychiatric nursing. APNA should work with organizations such as NCNQ, the National Quality Forum, and AHRQ to determine these specific indicators and to disseminate innovative models for effective and safe staffing.
8. In conjunction with other national organizations and with nurse researchers, APNA should pursue studies that focus expressly on psychiatric units and hospitals. In this way, psychiatric nurse staffing can be evaluated in a manner that is well represented and on equal measure with staffing models in other hospital settings.
9. APNA will establish a work group to research the availability of a standardized acuity tool that can be modified, if needed, and implemented across psychiatric inpatient units.
10. As leaders and direct-care providers, psychiatric RNs should be acknowledged as integral partners in the institution and be authorized to develop policies on quality and safety of patient care.

Appendix



Acknowledgment

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References

Agency for Health Care Research and Quality (2007). Care of adults with mental health and substance

abuse disorders in US Community Hospitals, 2004 HCUP Fact Book #10, 2007. Available at www.ahrq.gov/data/hcup/factbk10/pdf

Aiken, L., Clarke, S., Sloane, D., Sochalski, J., & Silber, J. (2002). Hospital nurse staffing and patient mortality, nurse burnout, and job dissatisfaction. *Journal of the American Medical Association*, 288, 1987-1993.

American Nurses Association. (April 2011). CNPE Draft position statement (04-25-2011): Nurses' involvement with the EHR: Advocating patient safety. Available at <http://www.nursingworld.org/Draft-Position-Nurses-Involvement-EHR>

American Nurses Credentialing Center. (2011). Program overview. Retrieved from <http://www.nursecredentialing.org/Magnet/ProgramOverview.aspx>

Blegen, M., Goode, C., Spetz, J., Vaughn, T., & Park, S. (2011). Nurse staffing effects on patient outcomes. *Medical Care*, 49, 406-414.

Bolton, L., Gassert, C. & Cipriano, P. (2008). Smart technology, enduring solutions: Technology solutions make nursing care safer and more efficient. *Journal of Healthcare Information Management*, 22, 24-30.

- Blumenthal, D., DesRoches, C., Donelan, K., Ferris, T., Jha, A., Kaushal, R., Foubister, V. (2008). *Health information technology in the United States, 2008: Where we stand*. Princeton, NJ: Robert Wood Johnston Foundation. Retrieved from <http://www.rwjf.org/files/research/062508.hit.xsummary.pdf>
- Clarke, S., & Donaldson, N. (2008). Nurse staffing and patient care quality and safety. In Hughes, R. G. (Ed.). *Patient safety and quality: An evidence-based handbook for nurses* (AHRQ Publication No. 08-0043, Chapter 25). Rockville, MD: Agency for Healthcare Research and Quality. Retrieved from <http://www.ahrq.gov/qual/nursesfdbk/>
- Coleman, J. C., & Paul, G. L. (2001). Relationship of staffing ratios and effectiveness of inpatient psychiatric units. *Psychiatric Services, 52*, 1374-1379.
- Cromwell, J., & Maier, J. (2006). Economic grand rounds: Variation in staffing and activities in psychiatric inpatient units. *Psychiatric Services, 57*, 772-774.
- Delaney, K. R., & Johnson, M. E. (2006). Keeping the unit safe: Mapping psychiatric nursing skills. *Journal of the American Psychiatric Nurses Association, 12*, 198-207.
- Donaldson, N., & Shapiro, S. (2010). Impact of California mandated acute care hospital nurse staff ratios: A literature synthesis. *Policy, Politics and Nursing, 11*, 184-201.
- Druss, B. G., & Reisinger Walker, E. (2011). Synthesis Project: Mental and medical comorbidity. Retrieved from www.policysynthesis.org
- Fries, B.E., Morris, J.N., Hirdes, J.P., Rabinowitz, T., Schmorrow, A., & Rosenberg, A. L. (2006). Final report: Design, development, and implementation of a prospective payment system for inpatient psychiatric hospitals and exempt units. Rockville, MD: University of Michigan Institute of Gerontology.
- Furukawa, M. F., Raghu, T. S., and Shao, B. B. M. (2010). Electronic medical records, nurse staffing, and nurse-sensitive patient outcomes: Evidence from California hospitals, 1998-2007. *Health Services Research, 45*(4), 941-962.
- Grantham, D. (2010). Psych hospitals adopt core measures. *Behavioral Healthcare, 30*(8), 24-29.
- Healthcare Information and Management Systems Society. (2011). *Stage 7 hospitals: Validated by HIMSS Analytics*. Retrieved from http://www.himssanalytics.org/hc_providers/stage7Hospitals.asp
- Hughes, R. G. (Ed.). (2008). *Patient safety and quality: An evidence-based handbook for nurses* (AHRQ Publication No. 08-0043). Rockville, MD: Agency for Healthcare Research and Quality. Retrieved from <http://www.ahrq.gov/qual/nursesfdbk/>
- Institute of Medicine. (2001). *Crossing the quality chasm: A new health care system for the 21st century*. Washington, DC: National Academies Press.
- Kane, R. L., Shamliyan, T., Mueller, C., Duval, S., & Wilt, T. J. (2007). *Nurse staffing and quality of patient care* (AHRQ Publication No. 07-E005). Rockville, MD: Agency for Healthcare Research and Quality. Retrieved from <http://www.ahrq.gov/qual/nursesfdbk/>
- Kronick, R. G., Bella, M., & Gilmer, T. P. (2009). *The faces of Medicaid III: Refining the portrait of people with multiple chronic conditions*. Washington, DC: Center for Health Care Strategies.
- Lang, T., Hodge, M., Olson, V., Romano, P., & Kravitz, R. (2004). Nurse-patient ratios: A systematic review of the effects of nurse staffing on patient, nurse employee and hospital outcomes. *Journal of Nursing Administration, 34*, 326-337.
- Mark, B., & Harless, D. (2011). Adjusting for patient acuity in measurement of nurse staffing: Two approaches. *Nursing Research, 60*(2), 107-114.
- Miller, B., Paschall, C., & Svendsen, D. (2006). Mortality and medical comorbidity among patients with serious mental illness. *Psychiatric Services, 57*, 1482-1487.
- National Center for Health Statistics. (2006). *Health, United States, 2006*. Hyattsville, MD: Author.
- National Quality Forum. (2004). *National voluntary consensus standards for nurse-sensitive care: An initial performance measure set (Final report)*. Retrieved from http://www.qualityforum.org/Projects/n-1/Nursing-Sensitive_Care_Initial_Measures/Nursing_Sensitive_Care_Initial_Measures.aspx
- National Quality Forum. (2009). *National voluntary consensus standards for nurse-sensitive care performance measure set maintenance*. Retrieved from [http://www.qualityforum.org/Projects/s-z/Tracking_Nursing-Sensitive_Care_Consensus_Standards_\(2007\)/National_Voluntary_Consensus_Standards_for_Nursing_Sensitive_Care_Performance_Measure_Set_Maintenance.aspx](http://www.qualityforum.org/Projects/s-z/Tracking_Nursing-Sensitive_Care_Consensus_Standards_(2007)/National_Voluntary_Consensus_Standards_for_Nursing_Sensitive_Care_Performance_Measure_Set_Maintenance.aspx)
- Needleman, J., Buerhaus, P., Mattke, S., Stewart, M., & Zelevinsky, K. (2002). Nurse-staffing levels and the quality of care in hospitals. *New England Journal of Medicine, 346*, 1715-1722.
- Needleman, J., Buerhaus, P., Pankratz, S., Leibson, C. L., Stevens, S. R., & Harris, M. (2011). Nurse staffing and inpatient hospital mortality. *New England Journal of Medicine, 364*, 1037-1045.
- Needleman, J., & Hassmiller, S. (2009). The role of nurse in improving hospital quality and efficiency: Real world results. *Health Affairs, 28*, w625-w633.
- Newcomer, J., & Hennekens, C. (2007). Severe mental illness and risk of cardiovascular disease. *Journal of the American Medical Association, 298*, 1794-1796.
- Page, A. (Ed.). (2004). *Keeping patients safe: Transforming the work environment of nurses*. Washington, DC: Committee on the Work Environment for Nurses and Patient Safety, Board on Health Care Services, Institute of Medicine of the National Academies, National Academies Press. Retrieved from http://www.nap.edu/openbook.php?record_id=10851&page=R1#

- Pincus, H. A., Spaeth-Rublee, B., & Watkins, K. E. (2011). The case for measuring quality in mental health and substance use care. *Health Affairs, 30*, 730-736.
- Safford, M. M., Allison, J. J., & Kiefe, C. I. (2007). Patient complexity: More than comorbidity. The Vector Model of Complexity. *Journal of General Internal Medicine, 22*(suppl 3), 382-390.
- Stanton, M., & Rutherford, M. (2004). *Nurse staffing and quality of patient care* (research in Action: Issues 14. AHRQ Publication No. 04-0029). Rockville, MD: Agency for Healthcare Research and Quality. Retrieved from <http://www.ahrq.gov/research/nursestaffing/nursestaff.pdf>
- Thingjaroenkul, P., Cummings, G., & Embelton, A. (2007). The impact of nurse staffing on hospital costs and patient length of stay: A systematic review. *Nursing Economics, 25*, 255-265.
- Unruh, L. (2008). Nurse staffing: Patient, nurse and financial outcomes. *American Journal of Nursing, 108*, 62-70.
- U.S. Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Office of Applied Studies. (2005). *2005 State estimates of substance use and mental health: 6. Mental health*. Retrieved from <http://www.oas.samhsa.gov/2k5/State/ch6.htm>
- Valderas, J. M., Starfield, B., Sibbald, B., Salisbury, C., & Roland, M. (2009). Defining comorbidity: Implications for understanding health and health services. *Annals of Family Medicine, 7*(4), 357-363.
- Wier, LM, Levit K, Stranges E, Ryan K, Pfunter A., Vandivort R et al. (2010). *HCUP Facts and Figures: Statistics on Hospital-based Care in the United States, 2008*. Rockville, MD: Agency for Healthcare Research and Quality. Retrieved on September 1, 2011 from <http://www.hcup-us.ahrq.gov/reports.jsp>.