Nurse staffing & patient outcomes

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Decades of research

• In the 1980’s… eg.
  - Hinshaw et al (1981) ‘Staff, patient and cost outcomes of all RN staffing’
  - Fagin (1982) ‘Nursing as an alternative to high cost care’ (review of 51 studies)

• Links to ‘magnet’ hospital research

• International Hospital Outcomes Study (5 countries)

• Twenty years later… RN4Cast
Kane et al 2007 - systematic review

- 96 studies
- Increased RN staffing was associated with lower hospital related mortality in
  - intensive care units (OR 0.91 CI 0.86–0.96)
  - surgical units (OR, 0.84; 95% CI, 0.80–0.89),
  - medical patients (OR, 0.94; 95% CI, 0.94–0.95)

*Kane et al (2007) Medical Care 45: 12, 1195-1204*
Lack of staff is often an excuse for poor care.... there is **no direct correlation** between number of staff and good or bad care.

*Harry Cayton, CHRE regulator, HSJ March 2012*
Context in England: call for new review

- Estimated 400-1,200 deaths beyond the expected level of mortalities at Mid Staffordshire Hospital Trust
- Patient neglect
- Independent inquiry 2010 (led by Robert Francis QC)
- Call for review of evidence and development of guidelines by NICE
Review of literature (for NICE, 2014)

What patient safety outcomes are associated with nurse and healthcare assistant staffing levels and skill mix?

- General medical and surgical settings (including older peoples’ wards)
- 1993 onwards
- Limited time frame, wide scope of questions
  - Search built on comprehensive searching undertaken for Kane’s (2007) systematic review of nurse staffing / outcomes
  - include only those studies that properly controlled for the contribution of the entire nursing team (including HCA)
  - & measured nurse staffing at ward level (not hospital)

Peter Griffiths, Jane Ball, Jonathan Drennan, Liz James, Jeremy Jones, Alex Recio-Saucedo, Michael Simon. Systematic review for NICE. March 9, 2014
Which patient outcomes?

- Mortality
- Failure to rescue (death following complications)
- Serious preventable events
  - *Hospital acquired infections*
  - ‘*Never events*’
    - serious, largely preventable safety incidents
    - (e.g. entrapment in bed rails)
  - ‘*Safety thermometer*’
    - including pressure ulcers, falls, UTIs, venous thromboembolism
Care outcomes – omissions and errors

Delivery of nursing care

- **Patients receiving assistance** with daily living activities, including missed care events such as help with eating, drinking, washing and other personal needs

- Completion of vital signs observations and other clinical paperwork

- Drug omissions and other nurse associated drug errors
Reported outcomes

Patient reported:

- Patient and/or carer experience and satisfaction ratings related to nursing care
- Patient complaints related to nursing care

Reported hospital ‘usage’:

- Length of admission
- Hospital re-admission
- Accident and emergency rates following discharge
Factors influencing staffing
5 reviews
• 21 primary studies

Economics
• 5 studies

Staffing / outcomes
35 primary studies
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Overview - findings

• 28 studies reported associations between nurse staffing levels and the outcomes considered for the review

• Strong evidence from several large observational studies that LOWER nurse staffing levels associated with HIGHER rates of death and falls

• Strong evidence that HIGHER nurse staffing is associated with LESS hospital use - length of stay or readmission associated

• Similar but less consistent evidence re infections

• Contradictory evidence re pressure ulcers.

• No evidence of an association with VTE
Mortality and Failure to Rescue - findings

For death (9 studies) and failure to rescue (7 studies), a relatively clear picture emerges.

Significant associations in six studies

- 4 (all rated ++ for validity): LOW staffing & HIGHER Mortality
  (Blegen et al., 2011, Needleman et al., 2011, Sales et al., 2008, Sochalski et al., 2008)

- 2 (rated ++ for validity): LOW staffing & HIGHER Failure to Rescue
  (Park et al., 2012, Twigg et al., 2013)

No study showed a significant adverse relationship.
Falls and pressure ulcers - findings

Falls (12 studies)
3/12 (+ or ++) sig. association: HIGH staffing with LOWER rates of falls (Donaldson et al., 2005, Patrician et al., 2011, Potter et al., 2003).
5/12: same direction of association but results not significant

Pressure ulcers (12 studies)
• 3/12 (+, -, -) sig. negative assoc.: LOW staffing & LOW rates of ulcers (Donaldson et al., 2005, Duffield et al., 2011, Hart and Davis, 2011)
• 2/12 studies (both ++), significant POSITIVE association – HIGH staffing associated with LOWER incidence (Cho et al., 2003, Twigg et al., 2013).
Gaps in the research

- The outcomes measured generally represent failures of care, not positive ‘quality’.
- Current measures of quality in research do not reflect contributions of healthcare assistants.
- Relatively little evidence derived from the EU/UK
- “Risk adjustment” for pressure ulcers and other outcomes
But whilst there are some gaps…

- The evidence that there is an association between staffing and patient outcomes is substantial.

- Number of good quality, large scale, multi site observational studies have consistently found:
  
  HIGHER nurse staffing is associated with LOWER hospital mortality and LOWER risk of harms.
An increase in a nurses’ workload by one patient increased the likelihood of an inpatient dying within 30 days of admission by 7% (odds ratio 1.068, 95% CI 1.031–1.106, p = 0.0002)

Talking numbers - what ratio?

• Most studies do not give staffing levels
  – Rather coefficients that allow calculation of differences associated with *change*
  – Linear relationships are modelled

• NHS study (Ball et al., 2013) reported levels:

  Risk of care being left undone was only significantly reduced on the best staffed shifts
  (6 pts or fewer per RN on a day shift)
Care left undone by pts per RN (day shifts)

Mean number of tasks left undone

Patients per RN

< 4
4
5
6
7
8
9
10 plus

Sweden
England

RN4CAST
Thank you

If you want to know more or to get in touch:

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