New study reveals how nurse staffing levels link to patient outcomes

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A new study investigating the links between variations in patient wellbeing and how registered nurses deliver care to their patients, has been published in the *BMJ Open*.

Academics from Birmingham City University's Faculty of Health, Education and Life Sciences have collaborated on the study which has been led by London South Bank University (LSBU) and funded by NHS England.

The study entitled, 'Mining routinely collected acute data to reveal non-linear relationships between nurse staffing levels and outcomes' shows that the number and type of nurses, such as registered nurses or healthcare support workers, has a direct effect on safety outcomes such as falls and the management of symptoms like nausea and vomiting.

The research findings show that when these aspects of care are delegated to unregistered nurses or healthcare support workers, an increase in patient falls is observed which could lead to poorer patient outcomes.

Large volumes of routinely collected hospital data were used and the analysis and different possible scenarios were considered. One example scenario suggests that replacing six healthcare support workers with six registered nurses on wards with the highest incidences of falls could decrease the monthly total number of falls by 15 per cent.

Falls are also costly in terms of their impact on patient wellbeing,

resulting in distress, pain, injury, loss of confidence, loss of independence, a crippling impact on personal finances and mortality. For example, in 2007 falls in hospital were estimated to cost the NHS more than £15million a year.

Professor Alison Leary at LSBU's School of Health and Social Care said:

"We must look at the usefulness of the currently collected data and how it might be used to shape hospital safety.

"This was a very exciting project to work on as it's a different way of thinking about the contribution nurses make to patient safety. We were very surprised that so many signals emerged from the data and it is useful that we were able to feed the new knowledge back to the Trust who then used it in many different ways to look at patient safety.

"The fact that University Hospital Coventry and Warwickshire had collected a high quality dataset over many years made this work possible."

This study, led by LSBU and funded by NHS England, is the product of a collaboration with partners, Birmingham City University, University Hospital Coventry & Warwickshire NHS Trust and Wolfram Research. The research was conducted at one hospital in England, but the techniques could be applied in other centres, provided good quality data is available.

The research team on this project included a patient and co-researcher, Malcolm Gough, who contributed to the direction and quality of the research.

Malcolm Gough, said, "As a volunteer/patient advisor and user I was able to relay my experience gained by talking to hundreds of patients

over many years.

"I think this is only the tip of the iceberg as there is so much more information available to work with."

Dr Sarahjane Jones, Senior Research Fellow, Centre for Social Care, Health and Related Research, Birmingham City University, said:

This exciting opportunity to work across sectors to identify previously invisible insight demonstrates the advantages of working together, including with patients and Malcolm's experiences were vital in our understanding of the data in the real world. Further work is needed to establish the extent of these relationships across more organisations.

More information: Mining routinely collected acute data to reveal non-linear relationships between nurse staffing levels and outcomes. *BMJ Open* 2016; 6:e011177, DOI: 10.1136/bmjopen-2016-011177

Provided by Birmingham City University

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