ABSTRACT

The SHEEP model allows the frequency of risk factors to be analysed at individual, team and department levels over time. Recognition of repeated patterns of factors can then provide efficient and effective targeting of sparse health resources to reduce patient safety failures.

KEYWORDS

Health Resources, Patient Safety, SHEEP, SHEEP Model

INTRODUCTION

The Mid Staffordshire Report (QC, February 2013) should be seen as a turning point in healthcare which can precipitate a ‘learning culture with continuous improvement’. This paper identifies a tool that can underpin the analysis of error but that takes into account the human factors that have previously been ignored.

Gawande has demonstrated in other fields in healthcare, the benefit of using a checklist approach to aid memory. (Gawande, 2007, 2010) The ability to select factors from a structured checklist encourages better factor identification. (Rosenorn-Lanng Book 1) We have proposed a new model (the SHEEP model) that is described in detail elsewhere.

This structured factor model approach to error analysis increases the understanding of the multiple contributing factors. The tool also provides a link between the technical issues, process issues and particularly social and informal issues that are often ignored in other approaches and highlighted in recent critical health failures (QC, February 2013). Incorporating human factors within this model allows us to initiate safety positive culture change in line with key recommendations in the Francis Report (QC, February 2013) (1.152,1.176,1.180,1.184,1.185, 1.196) by identifying more fully the factors involved.

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Root cause analysis (RCA) rarely includes human factors in its solution approach (Doggett 2005, Giardina et al. 2013). The root cause analysis commonly uses a fishbone approach to identify factors (Ishikawa) but the content and structure is left to those performing the analysis and therefore often misses aspects and may also be biased (Vincent, 2004; Leszak et al. 2000.).

Whilst ‘human factors’ are well embedded within other industries such as aviation, it has been slow to be adopted into healthcare. The SHEL model (Edwards 1972, International Civil Aviation Organisation) and its derivative the SHELL model (Hawkins 1975) were developed in aviation. Attempts were made to adopt this model into healthcare (Molloy, Feb 2005) but it was found that the aviation process models were not entirely applicable to healthcare settings. We have used grounded theory to ensure a healthcare focused model. It is hoped this organic approach to change (i.e. developed by healthcare for healthcare) will be more likely to embed effectively.

Theories suggest that a blame culture has detrimental effects on reporting levels and hence on patient safety (Mohr, Abelson, & Barach, 2002; Reason, 1998). It was originally thought that we should encourage a ‘no blame’ culture in its place (Walton, 2004; Khatri et al, 2009). We prefer the terms ‘open’ culture and ‘learning’ culture. It implies that we can be honest when we make a mistake, but we will also be ready to embrace the learning that follows.

METHODS

The SHEEP factor model was developed from factors identified from open questioning of over 250 human factors training course participants over 14 months. Respondents were drawn from all hospital staff (medical, nursing and non-clinical). Open questions were used to gather data about what human factors influence staff efficiency, patient safety and error (Denscombe, 2010).

A grounded theory approach was used as the most appropriate method to develop a structured model of the relevant factors (J. & A., 1990; Martin & Turner, 1986; Mills, Bonner, & Francis, 2006). This enabled an extensive range of themes and their relationships from varied participants to be elicited.

After each training session of appropriately 12 participants, the factors were analysed offline and structured into appropriate groups and duplicates removed. Axial coding involved investigating category relationships between the codes and established the primary groups based on accepted hospital norms rather than those in aviation (Li, Liu, Li, & Yang, 2008; Mohr & Batalden, 2002). This data was then used as a starting point for an iterative review, adjustment and addition by follow on groups through 20 cycles until no new factors were contributed (although courses, data capture and review continues). Other offline work included iterative elective coding of the most significant categories based on feedback, followed by identification of logically related concepts to optimise the form and ease of recognition of the model.

Once the factors had been established and categorised they were presented as the ‘SHEEP sheet’ kindly reproduced with permission from OUP (see Figure 1).

The SHEEP (Rosenorn-Lanng, 2014) acronym represents the key categories: Systems, Human interaction, Environment, Equipment and Personal. An overview of each category is given in detail (Michell et al., 2014).

Once the SHEEP sheet was developed, 1000 data sets were collected from participants on subsequent courses. The staff mix was as previously stated i.e. medical, nursing, allied health professionals and non-clinical healthcare staff. The 1000 healthcare staff was predominantly from secondary care.
Challenges in Clinical Data Linkage in Australia: Perspective of Spinal Cord Injury
Jane Dominique Moon, Megan Bohensky and Mary Galea (2016). International Journal of Big Data and Analytics in Healthcare (pp. 18-29).
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