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Safe and effective nursing shift handover with NURSEPASS: An interrupted time series☆

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ABSTRACT

Aim: Implementation of a locally developed evidence based nursing shift handover blueprint with a bedside-safety-check to determine the effect size on quality of handover.
Methods: A mixed methods design with: (1) an interrupted time series analysis to determine the effect on handover quality in six domains; (2) descriptive statistics to analyze the intercepted discrepancies by the bedside-safety-check; (3) evaluation sessions to gather experiences with the new handover process.
Results: We observed a continued trend of improvement in handover quality and a significant improvement in two domains of handover: organization/efficiency and contents. The bedside-safety-check successfully identified discrepancies on drains, intravenous medications, bandages or general condition and was highly appreciated.
Conclusion: Use of the nursing shift handover blueprint showed promising results on effectiveness as well as on feasibility and acceptability. However, to enable long term measurement on effectiveness, evaluation with large scale interrupted times series or statistical process control is needed.

1. Background

Communication failures threaten patient safety, especially at moments when care is handed over from one healthcare professional to another. In an analysis of sentinel events The Joint Commission identified communication and handover failures as a contributing cause in two out of every three sentinel events (The Joint Commission, 2014). In the report, 'Crossing the Quality Chasm' the Institute of Medicine stated that handovers provide an opportunity for error and that "in a safe system, information is not lost, inaccessible, or forgotten in transitions"(Institute of Medicine, Committee on Quality of Health Care In America, 2001). In a 2014 hospital survey on patient safety culture, healthcare professionals reported that "important patient care information is often lost during shift changes and patient transfers" (Agency for Healthcare Research and Quality, n.d.).

If clinically relevant information is shared accurately and in a timely manner, it may prevent adverse events, inappropriate treatment and delay and omission of care (Mardis et al., 2015). Global initiatives on handover, as well as accreditation bodies, promote standardization of the handover process to enhance continuity of care and patient safety (Australian Medical Association, 2006; World Health Organization (WHO), 2006). During the past decade many organizations responded to this call and initiated quality improvement (QI) studies to standardize the handover process by means of handover tools. The methodological approach of these QI studies varied significantly in terms of their quality and rigor. Most studies were quasi experimental or observational and predominantly made use of survey-based tools with user or patient satisfaction metrics to evaluate outcome measures resulting in a call for more rigorous research designs (Mardis et al., 2015; Smeulers, Lucas, & Vermeulen, 2014). Therefore as to date there is no high level evidence available on which recommendations for an effective nursing handover can be based (Smeulers et al., 2014). Also, from efforts of the World Health Organization to standardize handover globally, it was concluded that the handover process is complex and heavily influenced by cultural and environmental issues that are not measurable and easy to standardize across different healthcare organizations (World Health Organization (WHO), 2013). Other research also indicates that even though the use of a structured tool is advisable, no one singular tool is considered suitable for all clinical situations (Anderson, Malone, Shanahan, & Manning, 2015).

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A complex intervention, such as the handover process, is characterized by multiple interacting components, required behaviors of those delivering or receiving the intervention and a variability of outcomes to evaluate feasibility, acceptability and effectiveness of the intervention (Craig et al., 2013; Ovretveit et al., 2011). For a complex intervention to develop into maturity a stepwise, iterative approach with field tests, pilot studies and quasi-experimental designs according to the Medical Research Council (MRC) framework is recommended (Craig et al., 2013). By applying such an approach the intervention is developed and tested in several stages building up toward a large scale rigorous evaluation of a mature intervention. Therefore, we adopted the MRC framework for complex interventions (Fig. 1, study design) for the development and evaluation of a nursing shift handover intervention.

This pilot study (phase 3 according to the framework) of the implementation of a nursing shift handover blueprint on two departments addressed the following research questions: (1) How large is the effect size of the handover blueprint on the quality of nursing shift handover? (2) How many and what kind of discrepancies between expected and actual clinical situation are overcome with a bedside-safety-check? (3) What are the nurses' experiences with the feasibility, acceptability and implementation of the handover blueprint?

2. Methods

2.1. Setting

The study was conducted at the Academic Medical Center, a large tertiary care university hospital in Amsterdam. At the start of our project no formal hospital-wide handover policy existed, neither for nursing or physician shift handover nor for other handover moments. From interviews with senior nurses of different departments we found a large practice variation in handover styles, however reading the nursing files by the incoming nurses and requesting clarification from the leaving nurse if necessary, was the most commonly used handover style. Most departments did not use a predefined structure and if a structure was used, predominantly that of the tracts (nervous system, respiratory system, circulatory system, digestive system, etc.) was applied. The majority of the departments acknowledged the importance of handover to ensure continuity and safety and was positive about changing and improving the handover style. They indicated a preference for a predefined structure for three reasons; easy access to information, uniformity through a shared mental model of content and order, and improved ability to take over the responsibility for a patient. From the interviews with the senior nurses, we concluded that there was a sense of urgency and willingness to change and improve the nursing handover. This was further supported by the upcoming Joint Commission International (JCI) re-accreditation, where handover was identified as an improvement issue.

2.2. Study design

The development, evaluation and implementation of the new handover style were set about as a pilot study within the MRC framework (Fig. 1).

The first step was to identify the evidence base on most effective nursing handover style through a Cochrane systematic review of studies with a randomized controlled study design (RCT) (Smeulers et al., 2014). Unfortunately, most identified studies used a simple before-and-after design, as a consequence, uncertainty remained about the most effective nursing handover style.

As evidence from RCTs was lacking, the best available evidence was from SRs of studies with before-and-after designs. We identified these SRs with the search strategy of our Cochrane systematic review, and used those to develop a new nursing shift handover process which we also tailored to the local situation (step 2). For inclusion of the SRs we applied the criteria used by the Database of Abstracts of Reviews of Effects, this resulted in four SRs (Arora et al., 2009; Foster & Manser, 2012; Riesenberg, Leitzsch, & Cunningham, 2010; Staggers & Blaz, 2013). Based on these SRs we drafted 15 provisional recommendations on four questions on with respect to continuity and safety of care and preferences of professionals and patients: (1) 'How to handover'(which nursing shift handover style (written and/or verbal and structured or not) has preference), (2) 'What to handover' (what topics should be addressed in each nursing shift handover), (3) 'Where to handover' (Is bedside nursing shift handover preferred over other locations), and (4) 'Preconditions for handover'(which preconditions for nursing shift handover are important). The questions were answered in a three round iterative consensus process according to the RAND modified Delphi method (Fitch, BS, Aguilar, et al., 2001). This resulted in a local nursing shift handover blueprint (from here on referred to as: 'handover blueprint') consisting of 18 recommendations for handover: one recommendation on how to handover (e.g. structured), 12 recommendations on what to handover (e.g. minimal dataset and safety check at the bedside), three recommendations on where to handover (e.g. quiet location) and two recommendations on the preconditions for an effective handover (e.g. communication verification and training). The

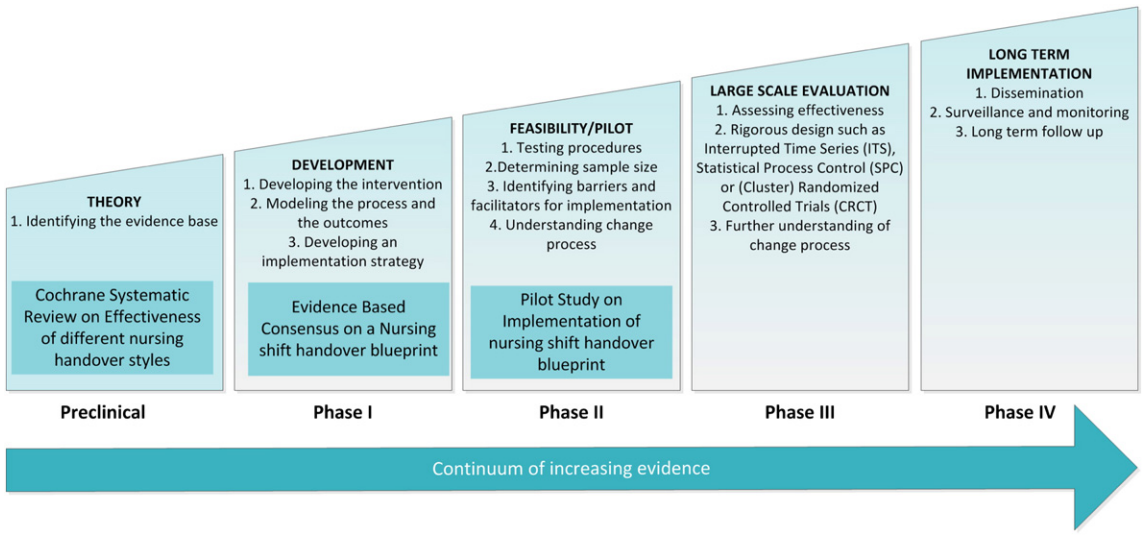

Fig. 1. MRC development and evaluation framework. Adapted from: Craig P et al. Developing and evaluating complex interventions: the new Medical Research Council guidance. Int J Nurs Stud 2013:50:587–92.