



Original research

The impact of an enhanced recovery pathway on nursing workload: A retrospective cohort study [☆]



Martin Hübner ^{a,*}, Valerie Addor ^a, Juliette Sliker ^a, Anne-Claude Griesser ^b,
Estelle Lécureux ^b, Catherine Blanc ^c, Nicolas Demartines ^a

^a Department of Visceral Surgery, University Hospital of Lausanne (CHUV), Switzerland

^b Medical Direction, University Hospital of Lausanne (CHUV), Switzerland

^c Department of Anaesthesiology, University Hospital of Lausanne (CHUV), Switzerland

HIGHLIGHTS

- The success of enhanced recovery (ERAS) programs depends on fulfilment of the protocol.
- Nurses play a key role especially in the work-intensive early postoperative period.
- In this study, nursing workload per patient was decreased after introduction of ERAS.
- Increasing compliance with the ERAS protocol correlated to decreasing nursing workload.

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ABSTRACT

Background & aims: The importance of nursing for surgical patients has been frequently underestimated. The success of enhanced recovery programs after surgery (ERAS) depends on preferably complete fulfilment of the protocol and nurses are an important part of it. Due to the additional nursing action required, such protocols are suspected to increase the nursing workload. The aim of the present study was to observe and measure objectively nursing workload before, during and after systematic implementation of a comprehensive enhanced recovery pathway in colorectal surgery.

Methods: The program ERAS was introduced systematically in our tertiary academic centre 2011, since then our experience is based on more than 1500 ERAS patients. Nursing workload was prospectively assessed for all patients on a routine basis by means of a standardized and validated point system (PRN). In a retrospective cohort study, we compared nursing workload based on prospective data before, during and after ERAS implementation and correlated nursing workload to the compliance with the ERAS protocol.

Results: The study cohort included 50 patients before ERAS implementation (2010) and 69 (2011) and 148 (2012) consecutive patients after implementation; the baseline characteristics of the 3 groups were similar. Mean PRN values were 61.2 ± 19.7 per day in 2010 and decreased to 52.3 ± 13.7 ($P = 0.005$) and 51.6 ± 18.6 ($P < 0.002$) in 2011 and 2012, respectively. Increasing compliance with the ERAS protocol was significantly correlated to decreasing nursing workload ($\rho = -0.42$; $P < 0.001$).

Conclusions: Nursing workload is – against a common belief – decreased by systematic implementation of enhance recovery protocol. The higher the compliance with the pathway, the lower the burden for the nurses!

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* Corresponding author. Department of Visceral Surgery, University Hospital CHUV, 1011 Lausanne, Switzerland.

E-mail addresses: martin.hubner@chuv.ch (M. Hübner), valerie.addor@chuv.ch (V. Addor), juliette.sliker@chuv.ch (J. Sliker), anne-claude.griesser@chuv.ch (A.-C. Griesser), estelle.lecureux@chuv.ch (E. Lécureux), catherine.blanc@chuv.ch (C. Blanc), demartines@chuv.ch (N. Demartines).

1. Introduction

The importance of nursing for surgical patients has been frequently underestimated and nursing workload is almost never assessed in surgical studies. In fact nursing staff is playing a key role on surgical wards in general, and in Enhanced Recovery After Surgery programs (ERAS) in particular.

Enhanced recovery after surgery pathways have proven to reduce complications, hospital length of stay and costs in colorectal surgery [1–3]. The *Enhanced Recovery After Surgery* (ERAS) guidelines have been updated recently and include more than 20 individual items [4,5]. Compliance with those items however is very important, as it is correlated significantly with good clinical outcome [6]. Implementation of enhanced recovery protocols should therefore aim for possibly complete fulfilment of the individual items. However, any changes of practice with the addition of new specific measures are generally difficult to integrate into daily routine; this applies especially to the postoperative period [3,6,7]. It is obvious that nursing staff play a key role in the postoperative patient care [7,8] and increased nursing tasks are required during shorter hospital stays. Systematic ERAS implementation entails therefore radical changes in the structured working day of nursing staff and may be perceived as extra-work [8]. For these reasons, it is to be emphasized that successful implementation of enhanced recovery programs depends on acceptance of the new care pathway by the nursing staff and its collaboration with anaesthetists and surgeons.

The aim of the present study was to assess and compare nursing workload before, during and after implementation of an enhanced recovery program in colorectal surgery, and to correlate nursing workload with the adherence to our ERAS pathway.

2. Material and methods

The enhanced recovery after surgery program was systematically introduced for colorectal surgery in our tertiary academic centre in May 2011 [3]. Prospective documentation of compliance with the ERAS pathway and systematic audit of clinical outcome is a key component and was performed for all patients on a routine basis. Detailed comparison with 50 patients before implementation was mandatory to guide implementation and those 50 patients served as baseline prior to ERAS implementation in our hospital. Nursing workload was prospectively assessed for all patients routinely in order to assure sufficient nursing work-force for the patients. Based on prospective data, the present retrospective study analyzed nursing workload before, during and after ERAS implementation and correlated nursing workload with the compliance with our ERAS pathway. The Institutional Review Board approved the study and all patients provided written consent before surgery. The study was conducted in accordance with the STROBE criteria (<http://strobe-statement.org/>) and registered under www.researchregistry.com (UIN: 363).

2.1. Patients

The patient population included a consecutive cohort of elective patients operated in 2010 *before* implementation and all elective patients from May 2011 when the process started. Systematic implementation took about six months [3,7], and ERAS patients were therefore separately analyzed as being operated *during* (2011) or *after* (2012) implementation. All consecutive patients were included, and there were no exclusion criteria.

2.2. ERAS protocol and compliance (Table 1)

Our institutional enhanced recovery pathway was published recently [3] and is in accordance with the ERAS recommendations updated 2013 [4,5]. Table 1 provides a comprehensive overview with emphasis on nursing-related care measures. The change in practice induced by ERAS implementation is described in a semi-quantitative way (–, +, ++, +++) for every single item.

Compliance with the ERAS protocol was prospectively assessed for the different phases of perioperative care (pre-, intra- and post-operative; total) as previously published [9]. Briefly, enhanced recovery items were handled as dichotomous variables. Individual compliance was calculated as percentage of compliant patients/total patients (Fig. 2). The number of fulfilled items divided by the total number of the 21 enhanced recovery measures (%) is presented as overall compliance with the pathway (Fig. 1).

2.3. Measuring nursing workload

In our institution, nursing workload is assessed daily for all patients in order to plan the nursing resource needs for the next following 24 h. The anticipated work burden is quantified by means of a standardized and validated point system called *Projet de Recherche en Nursing* (PRN) [10]. Based on the nursing care plan, the PRN tool measures the nursing tasks that need to be achieved during the next 24 h. PRN is based on a list of 249 actions of care, called factors. The selection of factors is determined by the nurse for every patient based on an institutional standard protocol. The addition of the points of every factor determines the time of care required by each patient over 24 h; 1 point represents 5 min of nursing time. To the required times are added the predetermined times which take into account activities not included in the direct care (communication about the patient, administrative activities and interview, internal and external movements in and outside the ward). The data are handled electronically with dedicated software that allows following the load of care of an individual patient throughout the stay in different sectors or care units. PRN is a validated tool and used routinely in the entire hospital since 1992. The list of factors was elaborated by nurses in several countries using the PRN method (Canada, France, Italy, Spain, Switzerland) and the list of factors is regularly revised and updated [11] (<http://www.erosinfo.com/>).

2.4. Data collection

Nursing workload was documented prospectively by the nurses in charge of the patients as part of their clinical daily routine. They were unaware of the present scientific analysis. The same documentation based on the same factors was performed for the 3 study periods (before, during and after ERAS implementation).

A dedicated and specially trained enhanced recovery nurse was in charge of completing the prospective database, *ERAS Interactive Audit System*. Demographic and surgical details of all patients in the enhanced recovery pathway were captured along with detailed information on compliance with the protocol and audit of clinical outcome until a minimum of 30 days after surgery. Return of bowel function (flatus/stool) was recorded, and postoperative complications were graded according to the Clavien classification of complication [12]. Length of stay was counted from day of surgery until discharge. Discharge was performed on pre-established discharge criteria. Total hospital stay included preoperative days and early readmissions within 30 days after surgery.

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