



# Requirements for a successful Enhanced Recovery After Surgery (ERAS) program: a multicenter international survey among ERAS nurses

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Received: 22 February 2021 / Accepted: 24 February 2021  
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## Summary

**Introduction** Nurses are the linchpin of any Enhanced Recovery After Surgery (ERAS) program, as they are in direct contact with patients and various caregivers. The aim of the present survey was to assess ERAS key factors and challenges from a nurse's perspective.

**Methods** A qualitative study among ERAS dedicated nurses and ERAS Interactive Audit System (EIAS) administrators using an online questionnaire (Survey Monkey®, Palo Alto, CA, United States) comprising 29 questions. The survey focused on challenges and drawbacks encountered during ERAS training, implementation and daily clinical practice. Closed multiple-choice and open-end questions and semantic differential scales (0–10) were used. Those invited

to participate received three reminders within 4 and 8 weeks after invitation.

**Results** Of 306 nurses invited, 123 completed the survey (response rate 40%). Overall, the success of the institutional ERAS program was rated as  $6.9 \pm 2/10$ . Improving both patient outcomes (90%) and satisfaction (69%) were rated as main motivators for ERAS implementation, while time restraints (50%) and logistics (43%) were identified as the main barriers. The study revealed a wide heterogeneity in coordination and management strategies (ERAS meetings, work models, teaching strategies). Sustained staff education before (9.1/10) and after (9.1/10) implementation, a dedicated ERAS coordinator (8.9/10) and regular meetings (8.3/10 scale) were rated as key factors for a successful program. Difficulty of implementation, maintenance and data acquisition were all rated  $>5/10$ .

**Conclusion** Despite heterogeneity in coordination and management, the ERAS program is evaluated as successful from a nurse's perspective. Continuous staff education and coordination beyond the implementation period appear to be of the utmost importance for a sustained program.

**Keywords** Questionnaire · Nursing · Perioperative care · Feedback · Motivation

Original Study for consideration of publication as a Brief Report in *European Surgery*

**Data availability statement** The data that support the findings of this study are available from the corresponding author upon reasonable request.

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## Main novel aspects of the paper

- The first-of-its-kind survey amongst ERAS nurses revealed heterogeneity in coordination and management strategies.
- Continuous staff education beyond the implementation period and a dedicated coordinator appeared to be of key importance for an ERAS program of sustained high quality.

## Introduction

The Enhanced Recovery After Surgery (ERAS) concept has disseminated worldwide, with established positive effects on patients and healthcare due to reduced complications, length of stay and costs [1]. The success of this *modus operandi* is based on multimodal and multidisciplinary care. Nurses, in particular dedicated ERAS nurses (also called ERAS nurse coordinators), are the linchpin of a successful and sustainable program [2, 3]. While studies have primarily focused on clinical outcomes and hospital economics, the specific needs and point of view of nursing staff remains poorly explored [4, 5].

The aim of the present survey was to study key elements and challenges for ERAS care from a nurse's perspective.

## Material and methods

### Study design and participants

An international qualitative multicenter study was conducted through two separate channels: All nurses and ERAS Interactive Audit System (EIAS) administrators registered at the annual ERAS international meeting in 2017 and registered in the Encare society (provider of ERAS database and responsible for development and management of the EIAS web-based system). No participant was deliberately excluded.

The online, web-based questionnaire comprised 29 questions (online appendix). The survey focused on participant demographics, ERAS experience, motivation, challenges and drawbacks encountered during ERAS training, implementation and daily clinical practice. Closed multiple-choice and open-end questions and semantic differential scales (not important

at all: 0, very important: 10) were used. The survey was sent by email using online cloud-based software (Survey Monkey®, Palo Alto, CA, United States). Participants were sent two reminders at 4 and 8 weeks.

### Statistical analysis

Descriptive statistics for categorical variables were reported as number and percentage, while continuous variables were reported as mean and standard deviation (SD).

### Ethics

The survey did not require ethical approval as it only included expert opinions and no patient data were represented. The study was registered under [www.researchregistry.com](http://www.researchregistry.com) (UIN research registry # 3958).

## Results

In total, 123 out of 306 invited nurses completed the survey (40% response rate). Demographics of the responding participants are summarized in the Table 1 with a focus on setting, implementation history and personal experience.

### Pre-implementation: motivation and barriers

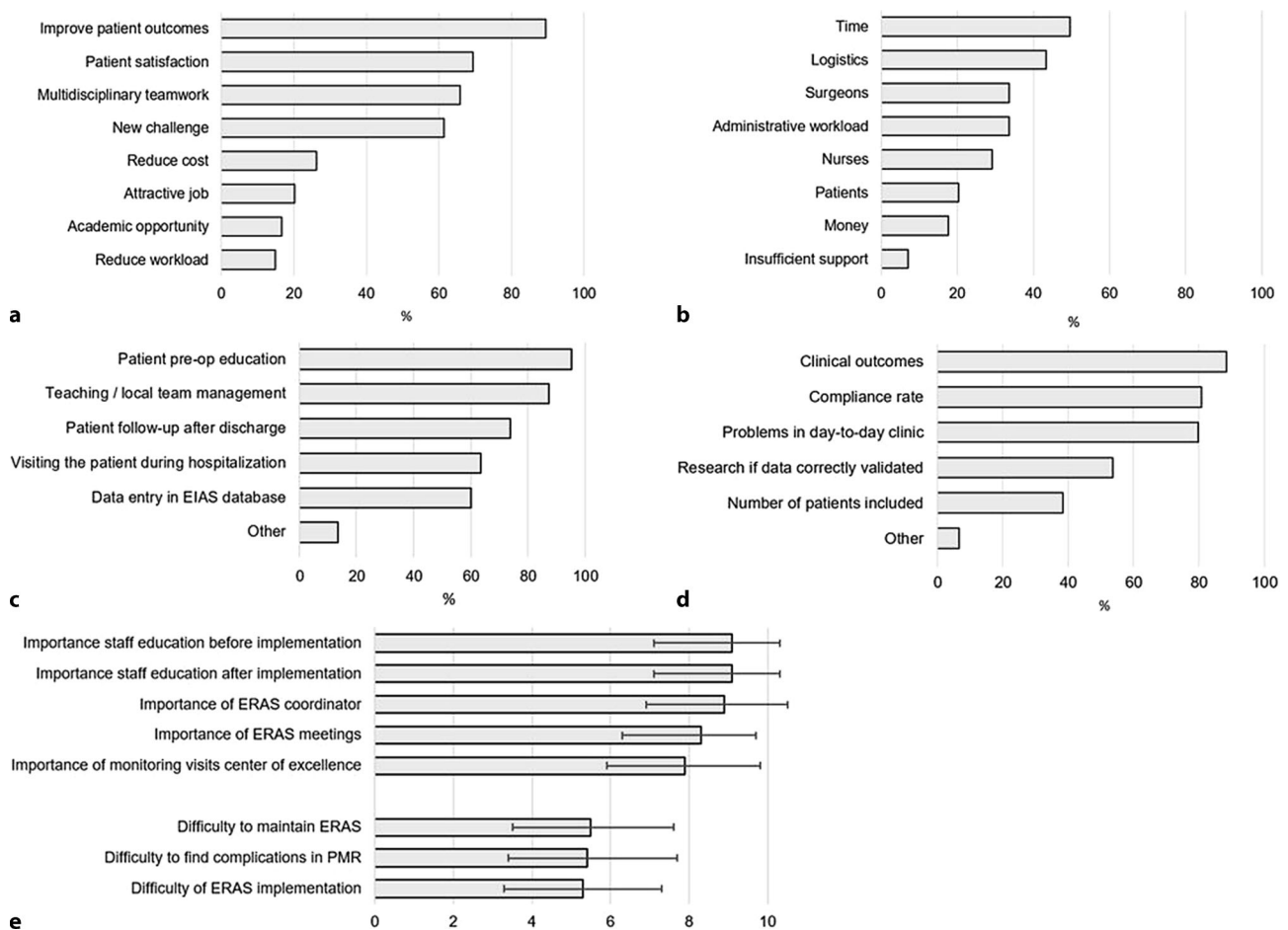
Main motivators to join an ERAS program and main barriers to implementation are shown in Fig. 1a, b.

### Coordination, training and audit

ERAS coordinators were most often dedicated ERAS nurses (57%), surgeons (21%), management staff (17%), anaesthetists (3%) or administrators (2%).

**Table 1** Participant demographics, training and meeting schedules

Item	n= 123
<b>Participant demographics</b>	
Age	< 40 Years: 41.8%
Gender (female-male (%))	113 (92%) - 10 (8%)
Years of experience	3.4 ± 2.9 Years
Countries of origin	20. Principally, Sweden: 30%, Switzerland: 12%, Singapore, UK: 7% each, Norway: 6%, Canada: 5%
Hospital setting	ERAS center: 44%, National ERAS center of excellence: 24%, not yet implemented: 17%, other: 15%
Current position	Clinical nurse: 31%, ERAS dedicated nurse: 28%, ERAS coordinator: 22%, data manager: 2%, other: 17%
Activity	Full time clinic: 23%, full time ERAS: 19%, part-time ERAS/part-time clinic: 35%, part-time ERAS/part-time research: 7%, other: 16%
ERAS dedicated time	100%: 17%, 81–99%: 7%, 61–80%: 12%, 41–60%: 20%, 21–40%: 16%, <20%: 28%
<b>Training and meeting schedules</b>	
<i>Training schedules</i>	
For nurses	Every 6 months (40%), upon new staff arrival (35%), monthly (7%), weekly (3%), never (15%)
For doctors	Every 6 months (31%), never (18%), unknown (42%), other (9%)
<i>Multidisciplinary ERAS meetings</i>	
Schedule	Every 6 months (23%), every 2–3 months (26%), monthly (37%), weekly (10%), never (4%)
Duration	1 h (51%), 1.5–2 h (23%), other (26%)



**Fig. 1** **a** Main motivating reasons and **b** suggested barriers for ERAS implementation, **c** main suggested attributes of an ERAS nurse, and **d** issues to be discussed during ERAS meetings (all in percent), **e** rating (0–10) of main reasons for a suc-

cessful ERAS implementation (*top rows*) and related challenges (*bottom rows*). Means and standard deviations are shown. *EIAS* ERAS interactive audit system, *ERAS* enhanced recovery after surgery, *PMR* patient medical records

Tasks attributed to ERAS nurses and issues discussed during ERAS meetings are displayed in Fig. 1c, d. Training schedules for nurses and doctors, together with schedules and duration of multidisciplinary ERAS meetings, are illustrated in the Table 1.

### Keys to success and challenges

Overall, the success of the institutional ERAS program was rated as  $6.9 \pm 2/10$ . Sustained staff education before and after implementation, a dedicated ERAS coordinator and regular meetings were rated as the most important elements for success of the ERAS program (Fig. 1e). External audit by expert centers was rated as important and appreciated by most participants to improve data accuracy (64%), ask questions (54%) and as an opportunity to refresh (45%). Only a handful of respondents considered external audit as a waste of time or an invasion of their “private sphere” (2% each). Difficulty of implementation, maintenance and data acquisition were all rated  $>5/10$  (Fig. 1e). Coding of complications and grading was retrieved from physicians’ daily notes (35%), through ward visits (22%),

discharge letters (19%) or unknown/other resources (24%).

The main suggestions for a sustainable ERAS program long term were: 1) to provide resources for continuous training, 2) to provide regular feedback on ERAS compliance for team motivation and 3) to discuss state-of-the-art publications for evidence-based care.

### Discussion

The present survey revealed some heterogeneity in ERAS coordination and management strategies. Nevertheless, overall program success was generally rated as high, with the main motivators related to improved patient outcomes and satisfaction. Time restraints and logistics were identified as the main drawbacks. Staff education both before and after implementation and a dedicated coordinator appear to be key for a successful program.

Considerable heterogeneity in both coordination and organization of ERAS programs among participating institutions was observed. More specifically,

ERAS-dedicated percentage/working time, frequency of staff education and meetings, as well as strategies of data acquisition and complication assessment varied between the various centers. These differences may be related to the international setting of this survey with local discrepancies. The findings also emphasize that there are different ways to achieve the common goal of a successful ERAS program.

The success of ERAS was rated as high (6.9/10). Previously published studies have reported that implementation of ERAS reduces nursing workload [2, 6]. However, these studies focused on the initial implementation period, and it has to be mentioned that further studies observed decreased sustainability after the initial enthusiasm from the implementation period had worn off [7–9]. Based on the present survey, staff education before as well as after implementation appears to be very important. One of the reasons cited was the constant turnover in nursing staff and physicians, which makes it difficult to sustain the appropriate level of training. Likewise, maintaining high-quality ERAS over time was evaluated to be as high as the implementation of ERAS itself (both > 5/10). While there appears to be no consensus on the optimal frequency of ERAS meetings and educational sessions, most responders agreed that continuous monitoring, mentoring and support by expert centers were important for sustainability. Furthermore, trouble-shooting by auditing clinical outcomes, compliance and problems in daily practice appeared to be more important than the mere focus on numbers and research (Fig. 1d). Importantly, external audit by expert centers was rated as important. This is in line with the findings of a recent study evaluating auditing methods in Switzerland [10]. The assessment of complications appears to be a potential point of frustration (Fig. 1e). Potential reasons for this may be incompatibility of EIAS software and local patient medical records (PMR), as well as logistics issues such as time restraints and insufficient staffing.

There was a need to better define the tasks of an ERAS coordinating nurse. This is important when considering that most participants indicated they only had a part-time commitment to ERAS. This need is illustrated by the high acceptance of pre-operative education and follow-up of the patient and teaching tasks, while data management was rated as less important. Nevertheless, improving both patient outcomes and satisfaction were considered main motivators for ERAS implementation. These results suggest that nurses may be keeping the focus on the patient rather than administrative tasks. At the same time, unless data is properly recorded, the possibility of maintaining high standards and correcting mismanagement is lost. Whether ERAS coordinating teams with shared responsibilities (clinical coordinator and administrator), or a data manager dedicated to data entry in order to lessen the burden for a single coor-

dinator would be an alternative strategy needs to be further investigated and applied.

Interestingly, only 20% of participants considered patients as a barrier for implementation. This is less than the barriers felt from both surgeons (34%) and fellow nurses (30%). On the other hand, time restraints, together with the logistics and administrative workload, appeared to be the main barrier for a successful ERAS program. This has previously been described [11]. Investment and insufficient support, both considered as important barriers in the early days of ERAS, were now only considered as minor issues. It seems that, today, ERAS coordinators and stakeholders put the financial burden of initial implementation into perspective of the repeatedly proven economic benefits in the long run [12, 13].

This study has limitations related to the relatively small number of invited participants and responders and potential selection bias of responders. Nevertheless, it revealed several areas with room for improvement from the nurse's perspective. These need to be considered in order to maintain a sustained and proliferative ERAS work environment.

## Conclusion

Despite heterogeneity in coordination and management, ERAS is reported to be a success from the nurse's perspective. Continuous staff education beyond the implementation period and a dedicated coordinator appeared to be of key importance for an ERAS program of sustained high quality.

**Supplementary Information** The online version of this article (<https://doi.org/10.1007/s10353-021-00698-9>) contains supplementary material, which is available to authorized users.

**Author Contribution** All authors contributed to the study conception and design. Material preparation, data collection and analysis were performed by B Pache, F Grass, V Addor, O Ljungqvist and M Hübner. The first draft of the manuscript was written by B Pache and F Grass, and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

**Funding** Open Access funding provided by Université de Lausanne.

**Conflict of interest** V. Addor is remunerated for ERAS implementation courses. O. Ljungqvist: ERAS Chairman, Founder and shareholder of Encare AB, speakers and travel honoraria from BBraun, Fresenius-Kabi, Nutricia and Pharmacosmos. N. Demartines is a member of the executive board of the ERAS Society. B. Pache, M. Hübner, D. Martin and F. Grass declare that they have no competing interests.

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