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## SCHWERPUNKT

# Effect of a two-year national quality improvement program on surgical checklist implementation



*Effekt eines 2-jährigen nationalen Verbesserungsprogramms zur Einführung der chirurgischen Checkliste*

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Submitted/eingegangen 25 January 2016; revised/überarbeitet 1 April 2016; accepted/akzeptiert 20 April 2016

### KEYWORDS

Surgical safety checklist; implementation program Switzerland; safety climate; attitudes; survey data

**Summary** Use of the surgical checklist in Switzerland is still incomplete and unsatisfactory. A national improvement program was developed and conducted in Switzerland to implement and improve the use of the surgical safety checklists. The aims of the implementation program were to implement comprehensive and correct checklist use in participating hospitals in every patient and in every surgical procedure; and to improve safety climate and teamwork as important cultural context variables.

10 hospitals were selected for participation in the implementation program. A questionnaire assessing use, knowledge, and attitudes towards the checklist and the Safety Climate Survey were conducted at two measurement occasions each in October/November 2013 and January/February 2015. Significant increases emerged for frequency of checklist use ( $F_{(1,1001)} = 340.9, p < 0.001$ ), satisfaction ( $F_{(1,1232)} = 25.6, p < 0.001$ ), and knowledge ( $F_{(1,1294)} = 184.5, p < 0.001$ ). While significant differences in norms ( $F_{(1,1284)} = 17.9, p < 0.001$ ) and intentions ( $F_{(1,1284)} = 7.8, p < 0.01$ ) were observed, this was not the case for attitudes ( $F_{(1,1283)} = .8, n.s.$ ) and acceptance ( $F_{(1,1284)} = 0.1, n.s.$ ). Significant differences for safety climate and teamwork emerged in the present study ( $F_{(1,3555)} = 11.8, p < 0.001$  and  $F_{(1,3554)} = 24.6, p < 0.001$ , respectively). However, although statistical significance was reached, effects are very

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## SCHLÜSSELWÖRTER

Chirurgische  
Checkliste;  
Implementierungs-  
programm in der  
Schweiz;  
Sicherheitsklima;  
Einstellungen;  
Fragebogenerhebung

small and practical relevance is thus questionable. The results of the present study suggest that the quality improvement program conducted by the Swiss Patient Safety Foundation in 10 hospitals led to successful checklist implementation. The strongest effects were seen in aspects concerning behaviour and knowledge specifically related to checklist use. Less impact was achieved on general cultural variables safety climate and teamwork. However, as a trend was observable, these variables may simply need more time in order to change substantially.

**Zusammenfassung** Die Anwendung der chirurgischen Checkliste ist in der Schweiz heute noch immer nicht zufriedenstellend. Ein nationales Verbesserungsprogramm wurde entwickelt und umgesetzt, um die chirurgische Checkliste einzuführen und ihre Anwendung zu verbessern. Ziele des Verbesserungsprogramms waren erstens die umfassende und richtige Anwendung der Checkliste in den teilnehmenden Spitälern bei jedem Patienten und jedem chirurgischen Eingriff und zweitens die Verbesserung des Sicherheitsklimas und der Teamzusammenarbeit als wichtige Aspekte der Betriebskultur. 10 Spitäler wurden für die Teilnahme am Programm ausgewählt. Zu zwei Erhebungszeitpunkten (Oktober/November 2013 und Januar/Februar 2015) wurden mit einem Fragebogen Anwendung, Wissen und Einstellungen gegenüber der chirurgischen Checkliste sowie Sicherheitsklima und Teamzusammenarbeit gemessen. Es zeigten sich signifikante Veränderungen für die Häufigkeit der Anwendung ( $F_{(1,1001)} = 340.9$ ,  $p < 0.001$ ), Zufriedenheit mit der Anwendung ( $F_{(1,1232)} = 25.6$ ,  $p < 0.001$ ) und Wissen ( $F_{(1,1294)} = 184.5$ ,  $p < 0.001$ ). Signifikante Unterschiede zeigten sich auch für Normen ( $F_{(1,1284)} = 17.9$ ,  $p < 0.001$ ) und Intentionen ( $F_{(1,1284)} = 7.8$ ,  $p < 0.01$ ), allerdings nicht für Einstellungen ( $F_{(1,1283)} = .8$ , n.s.) und Akzeptanz ( $F_{(1,1284)} = 0.1$ , n.s.). Auch Sicherheitsklima und Teamzusammenarbeit veränderten sich signifikant ( $F_{(1,3555)} = 11.8$ ,  $p < 0.001$  und  $F_{(1,3554)} = 24.6$ ,  $p < 0.001$ ), die geringen Effektstärken deuten aber auf eine geringe praktische Relevanz dieser Unterschiede hin. Die Ergebnisse der vorliegenden Studie zeigen, dass das von der Stiftung Patientensicherheit Schweiz durchgeführte Verbesserungsprogramm eine erfolgreiche Einführung der chirurgischen Checkliste bewirkt hat. Die stärksten Effekte zeigten sich bei konkretem Verhalten und Wissen in direkter Verbindung zur Anwendung der chirurgischen Checkliste. Geringe Unterschiede zeigten sich in den allgemeineren Kulturvariablen Sicherheitsklima und Teamzusammenarbeit. Der Trend deutet darauf hin, dass eine Veränderung in diesen Variablen mehr Zeit braucht.

## Introduction

The WHO estimated that more than 234 million major surgical procedures are undertaken every year worldwide [1]. In high-expenditure countries, the mean surgical rate is 11'110 per 100'000 population. Research suggests that 3-16% of patients undergoing surgery will suffer adverse events, with a considerable fraction of these events deemed preventable [2–4]. Surgery has also been identified as one major predictor of patient reported hospital-acquired infections [5]. Given the high volume of surgery, these figures make improvements in safety of surgery a global public health issue. During the last years the WHO surgical safety checklist has emerged as a powerful intervention to increase safety in surgery. The checklist has become one of the most strongly recommended “single-intervention” safeguards worldwide [6]. The checklist has been proven to be an effective intervention to reduce morbidity and mortality in surgical procedures [7]. However, recent evidence also suggests that simply making the surgical checklist mandatory by policy-makers does not necessarily improve surgical outcomes [8–10]. Research revealed that in order to be effective, the surgical safety checklist must be used and applied correctly, completely and in all patients [10–12]. While the checklist itself rather serves as a cognitive aid, the introduction of the checklist is a complex team intervention making its sustainable implementation challenging. The checklist is more than a ticking box exercise and requires change and

the willingness to change on different levels within an organization. For example, team communication behaviours and information sharing among team members during intraoperative phases have been associated with decreased mortality and major complications in surgery [13]. But interaction and communication within surgical teams require acceptance, acknowledgement and a joint understanding of the different roles of co-workers, in particular, across the professions. A recent systematic review confirmed that operating room teamwork and communication can be improved by checklist use. This may be one mechanism through which patient outcomes are improved with checklist implementation [14,15].

Checklist use in Switzerland is still incomplete and unsatisfactory. In a recent study, Mascherek et al. [16] found that about 80% of the study participants use a surgical checklist on an everyday level. Only 61% of the nursing staff and 72% percent of the doctoral staff were satisfied with the use of the checklist, indicating that the quality of use was less than perfect. Several European countries already work together in the High 5s project to improve checklist use in hospitals [17]. However, because Switzerland is not part of the European program, a national improvement program was developed and conducted in Switzerland to implement and improve the use of the surgical safety checklists. The program was developed based on implementation research, international quality improvement programs, and expert opinion. Leadership, inter-professional project teams, local

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