

Article

Seen through the patients' eyes: surgical safety and checklists

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Abstract

Objective: We sought to explore the views patients have towards surgical safety and checklists. As a secondary aim, we explored if previous experience of error or other patient characteristics influence these views.

Design: A cross-sectional survey study design was applied.

Participants: The Flemish Patients' Platform network and social media were used to recruit participants.

Main outcome measure(s): An 11-item questionnaire was designed to assess the following constructs: perception of surgical safety, attitudes towards the WHO surgical safety checklist and attitudes regarding checklist usage.

Results: Respondents' view ($N = 444$) on the risk of an adverse event showed considerable variation. Respondents were positive towards the checklist, strongly agreeing that it would impact positively on their safety. However, this positive perception did not translate into an attitude where patients will actively inform themselves whether a checklist is used. The majority of respondents have no difficulty with repetitive verification of identity, procedure and location of the surgery. Respondents with a clinical background were the least anxious. Views were divided regarding hearing discussions around blood loss or airway problems.

Conclusions: Patients perceive the checklist as a reliable safety tool. They do not mind repetitive verification of identity and procedure. However, hearing staff discussing specific, explicit, risks could cause anxiousness in some patients. Building a supportive and collaborative environment is needed to involve and empower patients to contribute in the realization of a safe hospital environment.

Key words: patient safety, quality improvement, patients, patient preference, attitudes, surgery, checklist

Introduction

The potential for checklists to improve surgical outcomes is supported across the literature [1–5]. However, implementation appears to be difficult. Clinicians' perceptions regarding the checklist—and by extension patient safety in general—are assumed to be a

determining factor [6]. The views of clinicians working with the checklist vary, with considerable differences between hospitals and professions [7–9], which translates in diverse interpretations and poor compliance [10, 11]. Moreover, a gap between individual perception and actual checklist usage exists [12]. Meaning that despite

individual confirmation of the checklists' importance, compliance is not guaranteed. Individual and collective willingness to use patient safety interventions depends on numerous factors—including their perception of effectiveness, ease of use, etc. [6, 13–15]. A factor exclusive to interventions used in presence of the patient, are concerns around patient perception and experience. In the case of surgical safety checklists, this leads to the omission of items perceived to cause patients stress (e.g. repetitive identity checks or discussing expected blood loss) or checklist performance without verifying out loud [6].

Contradicting the concerns expressed by clinicians, patients seem supportive toward the use of a surgical safety checklist without any added anxiety. Parents of paediatric surgical patients, for example, considered their involvement in the sign-in part of the surgical safety checklist (i.e. confirming with staff the identity of their child, the procedure to be performed, the operating site and the consent being adequately obtained and recorded) to be important for surgical safety without any added anxiety [16]. Patients themselves perceive the implementation of the surgical safety checklist to be a highly positive aspect of their surgical care [17]. Patients have positive attitudes towards checklist implementation and agree that it would have a positive impact on their safety and on surgical team performance [18]. Moreover, patients worried about coming to harm are particularly supportive. Still, items discussing expected blood loss and difficulties during intubation might create some worries [18].

This study explores the attitudes and perceptions of patients towards surgical safety in hospitals, with an emphasis on surgical safety checklists. As a secondary aim, we also explored if previous experience of error, or other respondent characteristics, influence these views.

Methods

Design and recruitment

A cross-sectional study design was used. Participants were recruited from the Flemish Patients' Platform network—an independent

Table 1 Respondents' characteristics (*N* = 444)

Characteristic	<i>n</i> (%)
Sex: male	131 (29.5)
Age in years median (range)	50 (18–91)
Education level	
Less than high school	63 (14.2)
High school	126 (28.4)
College	197 (44.4)
University	58 (13.1)
Number of past surgical operations	
0	52 (11.7)
1	64 (14.4)
2	71 (16.0)
3	58 (13.1)
4	32 (7.2)
5	36 (8.1)
6	31 (7.0)
7	21 (4.7)
8	14 (3.2)
9	5 (1.1)
10	8 (1.8)
>10	52 (11.7)
Previous errors in care: yes	161 (36.3)
Active as a clinician (doctor or nurse)	58 (13.1)

organization founded in 1999, which unites ~100 patient associations. Sampling was opportunistic, based on opting-in, and within the constraints of the following inclusion criteria: (i) all patients were over 18 years of age, (ii) were able and willing to provide informed consent to participate and (iii) could fully understand and express themselves in Dutch. To mitigate potential selection bias (e.g. patients active in a patient organization, in general, represent a population with serious, long-term diseases potentially altering their point of view), we additionally distributed the questionnaire using social media (Twitter and Facebook) with the aim of including a case mix of patients who underwent surgery and those who had not. In contrast to other studies [16–19], clinicians (i.e. nurses and physicians) were not excluded from the sample; as they, as a patient, might have different views on surgical safety checklists.

Questionnaire development

We developed a questionnaire based on other research in this area [16–18]. To safeguard the relevance of the questions and maintain understandable language, the questionnaire was developed in conjunction with two staff members of the Flemish Patients' Platform network. To communicate the checklists' concept and usage, the questionnaire was preceded by an example of the WHO checklist and an explanation of its use. To minimize bias, this was written in the most neutral language possible. Proof of the checklists effectiveness was not provided in order not to influence the respondents' opinion. Relevance and understandability of the checklist was crosschecked using a panel of 10 randomly selected patient representatives.

Measurement

The first section contained items exploring the demographic characteristics of the participants (Table 1). The second section contained a 11-item questionnaire designed to assess the following constructs: (i) perception of patient safety (two items, see Table 2), (ii) attitudes towards the WHO surgical safety checklist (five items, see Table 3) and (iii) attitudes regarding how the checklist is used in practice (four items, see Table 4). Each item, except for the questions regarding the respondents' perception of patient safety, was phrased as a statement, for example, 'I would feel safer if the checklist is used' or 'Repetitive verification of my identity before my operation would make me anxious'. Participants respond by using a 5-point Likert scale ranging from strongly disagree to strongly agree, with a neutral mid-point. Data were coded from 1 to 5 (1 = 'strongly disagree', 5 = 'strongly agree'), and negatively worded items were reverse scored so that, for all items, higher scores reflected more positive perceptions. To measure perception of patient safety, respondents were asked to rate the risk of adverse events during a hospital stay and during surgery (0–100%).

Data collection

The questionnaires were distributed through an online platform (Qualtrics) between June and October 2015, using the Flemish Patients' Platform network. General reminders were sent 2, 4 and 8 weeks after the initial announcement. Besides, we distributed the questionnaire using the university's social media accounts (Twitter and Facebook). We took several steps to mitigate the risk of common method bias, both ex-ante remedies as well as statistical controls after the questionnaires were returned (e.g. respondents were

Table 2 Respondents' view on adverse event risk versus previous surgical experience

	All median (range)	No surgery median (range)	Surgery median (range)	Surgery with complication median (range)
Chance of an adverse event during surgery (0–100%)	25 (1–83)	22 (2–80)	22 (1–81)	30 (1–83)
Chance of an adverse event in hospital (0–100%)	30 (1–90)	22 (5–79)	25 (1–90)	33 (5–90)

Table 3 Attitudes towards the WHO surgical safety checklist

Question	Strongly disagree, <i>n</i> (%)	Disagree, <i>n</i> (%)	Neither agree or disagree, <i>n</i> (%)	Agree, <i>n</i> (%)	Strongly agree, <i>n</i> (%)
I would feel safer if the checklist is used	4 (0.9)	5 (1.1)	21 (4.7)	136 (30.6)	278 (62.6)
I want the checklist to be used if I have an operation	4 (0.9)	4 (0.9)	30 (6.8)	108 (24.3)	298 (67.1)
I will ask the surgeon or anaesthesiologist if the checklist will be used if I have an operation	15 (3.4)	47 (10.6)	93 (20.9)	131 (29.5)	158 (35.6)
I will refuse an operation if the checklist is not used	39 (8.8)	91 (20.5)	164 (36.9)	92 (20.7)	58 (13.1)
Errors during an operation would be reduced if the checklist were used	4 (0.9)	6 (1.4)	58 (13.1)	169 (38.1)	207 (46.6)

Table 4 Attitudes towards use of the WHO surgical safety checklist in practice

Question	Strongly disagree, <i>n</i> (%)	Disagree, <i>n</i> (%)	Neither agree or disagree, <i>n</i> (%)	Agree, <i>n</i> (%)	Strongly agree, <i>n</i> (%)
Repetitive verification of my identity before my operation would make me anxious	193 (43.5)	127 (28.6)	53 (11.9)	39 (8.8)	32 (7.2)
Repetitive verification of the procedure and operation site before my operation would make me anxious	180 (40.5)	138 (31.1)	50 (11.3)	43 (9.7)	33 (7.4)
Hearing staff discussing potential airway problems before my operation would make me anxious	60 (13.5)	92 (20.7)	58 (13.1)	160 (36.0)	74 (16.7)
Hearing staff discussing blood loss before my operation would make me anxious	64 (14.4)	81 (18.2)	61 (13.7)	165 (37.2)	73 (16.4)

assured of confidentiality of the study and that there were not 'right' or 'wrong' answers) [20].

Statistical analyses

Univariate analyses were conducted to describe baseline demographic characteristics. We calculated the median score of patient perceptions due to the ordinal nature of the outcome variables. To assess the predictive factors for respondents' view on the risk of an adverse event, multivariate linear regression was utilized. Multivariate ordinal logistic regression was performed, with respondents' characteristics as covariates, predicting attitude towards the WHO surgical safety checklist. Both unadjusted or crude odds ratios (ORs) and adjusted ORs with 95% confidence intervals (CIs) were calculated. An adjusted odds ratio strips away the effects of other factors, theoretically leaving only the relationship between the two studied factors standing. The covariates included age, gender, level of education, clinical background, previous experience of complications, number of previous surgeries and education level. The significance level α was set at 0.05. All analyses were performed using R: A Language and Environment for Statistical Computing version 3.2.2 (R Foundation for Statistical Computing, Vienna, Austria) [21].

Ethical considerations

Participants were informed that the collected information would be kept confidential and that the questionnaire was anonymous. No incentives were provided for completing the questionnaire. A full proposal outlining all study methods and stages was reviewed by the ethics committee of Hasselt University, who granted permission for the study to proceed (ref. CME2015/545).

Results

Respondents' characteristics

In total, the questionnaire was answered by 525 people; 81 of the responses were not fully completed and therefore not included in the analysis. The final dataset consisted of the replies from 444 respondents. A wide age range was represented in the sample (median = 50 years, range = 18–91 years). The sample included more females than males (70.5% $n = 313$ vs. 29.5% $n = 131$). More than half of the respondents hold a college or university degree ($n = 255$, 57.5%). Some were active clinicians, i.e. physician or nurse ($n = 58$, 13.1%). Finally, 36.3% ($n = 161$) of the respondents reported that they had experienced an adverse event following surgery (e.g. medication error, surgical site infection or wrong site surgery). A detailed overview of the respondents' characteristics is presented in Table 1.

View on patient safety

Respondents' view on the risk of an adverse event during surgery is shown in Table 2. Notwithstanding the wide scoring range, multivariable regression analysis showed that respondents who previously experienced a surgery related adverse event, rated the chance of an adverse event during surgery higher compared to others ($\beta = 8.10$, $SE = 2.30$, $P < 0.01$). In addition, higher educated respondents giving lower risk scores ($\beta = -3.25$, $SE = 1.25$, $P < 0.01$). The respondents' age, gender, the number of previous operations and being active as a clinician had no significant effect.

Respondents' view on the risk of an adverse event during a hospital stay (Table 2) was influenced by the respondents' education level, with higher educated respondents giving lower risk scores ($\beta = -3.52$, $SE = 1.21$, $P < 0.01$) and the respondents' gender, with females giving higher risk scores ($\beta = 4.52$, $SE = 2.22$, $P < 0.05$). The respondents' age, the number of previous operations, and being active as a clinician had no significant effect.

Attitudes towards the WHO surgical safety checklist

The majority of respondents ($n = 376$, 84.7%) believes that errors during a surgical procedure would be reduced when a checklist is used. In line with this positive perception of checklist effectiveness most ($n = 414$, 93.2%) reported that checklist usage would make them feel safer. Consequently, most respondents want a checklist to be used when undergoing surgery ($n = 406$, 91.4%). However, it seems less obvious for patients to ask if a checklist will be used. Even fewer would refuse surgery if the checklist is not used ($n = 150$, 33.8%). The results are provided in detail in Table 3.

Our findings show that respondents' perception on the effectiveness of the surgical safety checklist tend to be more positive with older age (adjusted OR = 1.03; 95% CI: 1.02–1.04; $P < 0.05$); and being active as a clinician (adjusted OR = 2.18; 95% CI: 1.21–3.98; $P < 0.05$). Further, older age (adjusted OR = 1.03; 95% CI: 1.02–1.05; $P < 0.05$), female respondents (adjusted OR = 1.60; 95% CI: 1.02–2.52; $P < 0.05$), and being active as a clinician (adjusted OR = 5.21; 95% CI: 2.54–11.51; $P < 0.05$) made respondents more likely to agree with the statement that the use of a checklist would make them feel safer. The same characteristics made them more likely to agree with the statement 'I want the checklist to be used if I have an operation' (age: adjusted OR = 1.04; 95% CI: 1.02–1.05; $P < 0.05$, female: adjusted OR = 1.65; 95% CI: 1.04–2.62; $P < 0.05$, clinician: adjusted OR = 4.10; 95% CI: 2.04–8.73; $P < 0.05$).

The Likelihood to ask the surgeon or anaesthesiologist if a checklist will be used increased with age (adjusted OR = 1.05; 95% CI: 1.04–1.07; $P < 0.05$), being female (adjusted OR = 1.11; 95% CI: 1.04–1.07; $P < 0.05$) or having a clinical background (adjusted OR = 1.97; 95% CI: 1.13–3.45; $P < 0.05$). On the contrary, higher educational levels decreased the likelihood. Last, the likelihood for refusing an operation if no checklist is used increased with age (adjusted OR = 1.04; 95% CI: 1.03–1.05; $P < 0.05$) and decreased for respondents holding a college degree (adjusted OR = 0.48; 95% CI: 0.28–0.84; $P < 0.05$). The results are provided in detail in online Appendix II.

Attitudes towards use of the WHO surgical safety checklist in practice

Most respondents ($n = 320$, 72.1%) stated that repetitive verification of their identity would not make them anxious. Likewise,

71.6% did not bother repetitive verification of the procedure and operation site. Respondents with a clinical background were less anxious as a result from repetitive identity checks (adjusted OR = 0.38; 95% CI: 0.21–0.68; $P < 0.05$) and repetitive procedure and site verification (adjusted OR = 0.33; 95% CI: 0.18–0.60; $P < 0.05$). Respondents who previously experienced a surgery related complication were also less anxious as a result from repetitive procedure and site verification (adjusted OR = 0.49; 95% CI: 0.24–0.99; $P < 0.05$).

Respondents were divided with regards to whether they felt that hearing discussions around potential airway problems or blood loss (part of the 'sign-in' portion of the checklist) would make them feel anxious. When detailing on the discussion around blood loss, more than half of the respondents reported that it would make them anxious. The same held for the discussion around potential airway problems. Only the number of past surgical operations slightly decreased the likelihood for being anxious when hearing staff discussing blood loss (adjusted OR = 0.93; 95% CI: 0.87–0.99; $P < 0.05$). The results are provided in detail in Table 4 and online Appendix III.

Discussion

The respondents in this study estimated the probability of an adverse event, both during surgery and hospitalization, higher than published incidence rates [22, 23]. Overall, the probability of an adverse event was doubled or even tripled in comparison with published numbers [23]. Respondents who already experienced an adverse event during surgery estimated the incidence of adverse events higher compared to others. Further, patients were positive towards the implementation of the WHO surgical safety checklists and agree that it would have a positive impact on their safety. Consequently, most patients want a checklist to be used during surgery. However, this did not translate into an attitude whereat patients actively inform themselves if a checklist will be used and refuse surgery if this is not the case. Being active as a clinician reinforced a positive perception and attitude. Hesitation to ask about checklist usage and refusing an operation when no checklist is used can be explained by the concept of psychological safety. Patients' experience during surgery is characterized by anxiety and stress. Additionally, the patient–physician relationship is considered as a relationship of dependence, in which the patient attributes status to the physicians. This makes it difficult to ask if a checklist will be used, as patients do not want to question the professional capabilities of the surgeon or anaesthesiologist. Creating a supportive context endorsing open communication with the patient could support these kinds of questions (e.g. hospitals communications style, brochures, etc.).

The majority of respondents reported to have no problem with repetitive verification of items such as identity, type and location of the procedure. Respondents with a clinical background were least anxious, which can be explained by their knowledge and experience with identity vigilance. The same is true for respondents who already experienced an adverse event, probably because a sense of security is created by these repetitive verifications. Also, previous experience will make them familiar with the execution of the checklist, making it less strange and frightening. Perceptions regarding items informing on specific risks (i.e. potential blood loss and airway problems) are less consistent. Only a significant relationship with the number of previous surgeries was found. Again, this shows that when patients know what they can expect they will be less anxious.

Concurrent findings are reported in previous research [16–18]. Together, these results contribute to the argument that healthcare professionals are unduly concerned about patients' perception. We see no reason to omit repetitive verification of patients' identity and surgical procedure. This should be nuanced regarding hearing specific risks such as expected blood loss or airway problems. Here we must note that hearing staff discussing specific risks may induce a certain anxiety in patients. This dual experience, where some think that the checklist will reassure them that all eventualities have been taken into account while others find that it would make them feel anxious and worried, is also described in another study [18]. The same study also showed that patients did not feel they had a strong role to play in safety improvement more broadly [18]. As a result, some have suggested that adjustments on how the checklist is being used are needed [18]. However, we believe that active patient involvement during the sign-in phase can reduce fear and increase patient empowerment significantly. Another study showed that involvement of parents of paediatric patients while checking the sign-in items did not result in added anxiety, moreover, 97% felt reassured that the correct procedure was to be performed [16]. Patients identified physician–patient interactions, physician–patient relationships, and trust as the most positive factors influencing their perception of safety [19].

Implications for practice

Our results add to the existing knowledge by stressing the importance of patient experience during checklist usage. As shown, experienced patients—both with surgery and adverse events—are less anxious when confronted with this kind of safety interventions. This is strengthened by the fact that patients who are also active as a clinician—and therefore familiar with patient safety interventions—experience less anxiety. Hence, we need to facilitate the conversation between patients and clinicians on this subject. To this end, we can explore different ways: (i) behaviour of the person who reads the checklist aloud. By letting the patient know that he or she may ask clarifying questions when hearing anything unusual does not only take the fear away but will also raise patient involvement and will empower them to contribute in creating a safe environment. (ii) Communication among team members in the operating theatre, with a strong focus on patient involvement. Again, it is important to create conditions in which patients are encouraged to ask questions about any perceived ambiguities. Furthermore, it is important not to speak about the patient as if he or she is not present, but rather keep in touch with his or her concerns. (iii) A third option is that, during the preliminary consultation, the surgeon would spontaneously confirm and explain the use of the checklist.

Added to this, a patient's capacity to become involved will likely be influenced by their underlying intellectual, moral, and behavioural profile [24]. Patients can be involved at most stages of healthcare, and this can have a number of benefits [25]. However, uncertainty persists about how to organize patient involvement, evaluate its impact, and how to involve and support a diversity of individuals in a way that allows them to work in partnership to genuinely influence decision-making [25]. Greater attention is needed to enable power and decision-making to be shared more equitably with patients and the public in designing, planning and co-producing healthcare.

Limitations

The results of this study must be appreciated while keeping some limitations in mind. Respondents consist largely of members of patients' organizations, that is, dedicated and committed individuals

with a strong involvement in their care. This could result in a more critical attitude towards quality and safety of care. Further, a large group of respondents (36.3%) reported to be confronted with surgical complications. This could skew the results and call for cautiousness when generalizing the findings. Last, we also included clinicians in this sample. Their perception of quality and safety is undoubtedly influenced by their professional experience. However, we feel that it is important to include this group, as they can enter a patient role as well.

Conclusions

This study shows that patients perceive the checklist as a reliable safety tool and do not mind repetitive questions to verify their identity and procedure. Nevertheless, hearing staff discussing specific, explicit, risks could cause anxiousness in some patients. However, these items should not be omitted because of this reason. We suggest active patient involvement during the sign-in phase of the checklist. This requires building a supportive and collaborative environment, where patients can ask questions without hesitation. This is needed to involve and empower patients to contribute in the realization of a safe hospital environment.

Supplementary material

Supplementary material is available at *International Journal for Quality in Health Care* online.

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Author contributions

J.B. conceptualized and designed the study, collected the data, analysed and interpreted the data, and drafted the article. F.L., J.H. and D.V. conceptualized the study, interpreted the data, and revised the article for important intellectual content. M.D., W.S. and A.V. interpreted the data, and revised the article for important intellectual content. All authors had full access to all the data in the study and can take responsibility for the integrity of the data and the accuracy of the data analysis. All authors approved the final version to be published.

Ethics approval

Institutional ethics committee of Hasselt University.

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