

# Patients' and healthcare workers' perceptions of a patient safety advisory

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## Abstract

**Objective.** To assess patients' and healthcare workers' (hew) attitudes and experiences with a patient safety advisory, to investigate predictors for patients' safety-related behaviors and determinants for staff support for the advisory.

**Design.** Cross-sectional surveys of patients ( $n = 1053$ ) and hew ( $n = 275$ ).

**Setting.** Three Swiss hospitals.

**Participants.** Patients who received the safety advisory and hew caring for these patients.

**Intervention.** Patient safety advisory disseminated to patients at the study hospitals.

**Main Outcome Measures.** Attitudes towards and experiences with the advisory. Hcw support for the intervention and patients' intentions to apply the recommendations were modelled using regression analyses.

**Results.** Patients (95%) and hew (78%) agreed that hospitals should educate patients how to prevent errors. Hcw and patients' evaluations of the safety advisory were positive and followed a similar pattern. Patients' intentions to engage in safety were significantly predicted by behavioral control, subjective norms, attitudes, safety behaviors during hospitalization and experiences with taking action. Hcw support for the campaign was predicted by rating of the advisory (Odds ratio (OR) 3.4, confidence interval (CI) 1.8–6.1,  $P < 0.001$ ), the belief that it prevents errors (OR 1.7, CI 1.2–2.5,  $P = 0.007$ ), perceived increased vigilance of patients (OR 1.9, CI 1.1–3.3,  $P = 0.034$ ) and experience of unpleasant situations (OR 0.6, CI 0.4–1.0,  $P = 0.035$ ).

**Conclusions.** The safety advisory was well accepted by patients and hew. To be successful, the advisory should be accompanied by measures that target norms and barriers in patients, and support staff in dealing with difficult situations.

**Keywords:** patient safety, patient involvement, patient education, medical errors

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## Introduction

Involvement of patients in prevention of medical errors has been recommended by several authorities, e.g. the Council of Europe and the WHO [1, 2]. The US Institute of Medicine suggested several consumer actions to improve medication safety and prevent medication errors, e.g. not take a drug without being told the purpose for doing so [3]. Many organizations provide educational materials that intend to motivate patients to engage in their safety. Examples are the 'Speak up' initiative of the US Joint Commission [4], or the 'Your Health Care—Be Involved' campaign of the Ontario Hospital Association [5]. A recent review underlines the

spread of these advisories but also reports a large variability in the scope of these recommendations [6]. Safety actions commonly recommended to patients include traditional messages, e.g. ensuring proper transmission of information to and from providers, but also advocate challenging behaviors, such as asking staff whether they washed their hands. Despite the proliferation of patient advisories for safer care there is still limited evidence regarding the effectiveness of this approach. Interventions embedded within clinical settings have been successful to some extent, but evaluations of broader educational campaigns are lacking [7, 8]. Very little is known about patients' attitudes towards and acceptance of these materials and their utilization. Similarly, research into

healthcare workers' (hcw) support for these campaigns and their experiences with patients using these materials is scant. Only minor effects on workload and relationships with patients have been reported by nurses in an evaluative study of a program to increase medication safety by providing patients drug safety information [9]. The Swiss Patient Safety Foundation published an educational patient booklet for use in hospital care ('Help prevent errors! Your safety in hospital', available from the author upon request). This booklet was evaluated in a pilot study in three Swiss hospitals. Patients and hcw were surveyed about their attitudes towards patient involvement and the acceptability, utilization and experiences with the booklet. We investigated determinants that would explain hcw support for the campaign and predictors for patients' engagement in safety-related behaviors.

## Methods

### Details of the 'safety advisory'

The safety advisory was developed in an iterative procedure including a systematic review of the evidence, expert consultations, focus groups with patients and relatives, and formal tests of readability. The material covers key aspects of hospital care (e.g. communication, surgery, patient identification, hand hygiene and medication). The booklet encourages patient involvement in safety through vigilance, communication and cooperation. Patients are provided specific safety-related information together with recommendations about which issues to monitor, which actions to take, when, how and toward whom (Fig. 1). Two case studies of intervening patients are also presented. The advisory is organized in 10 chapters and has 19 pages of content (15.5\*23 cm). Each page has on average 112 words. Ten drawings are included as illustration. The booklet was initially prepared in four Swiss languages (Swiss-German, French, Italian and Rhaeto-Romanic) and has been translated to seven other languages (Albanian, English, Portuguese, Spanish, Tamil, Turkish and Western South Slavic). The Flesh Reading Ease Score of the advisory equals 67 for the German version, which translates to 7 years of education required to

understand the text. The average patient needs ~15 min to read the booklet.

### Design

Hospitals were selected based on geographical location, size and level of care provision. Three hospitals participated with the following departments: A University hospital (departments of gynecology/obstetrics, traumatology, orthopedic as well as plastic and reconstructive surgery), a large community hospital (department of internal medicine) and a small rural hospital (all departments). Clinical staff participated in teaching sessions (60 min) and information meetings (~10–20 min) to make them familiar with the booklet and ensure that hcw were adequately prepared for patients' questions, patients' pointing to (potential) errors, and other relevant interactions. All patients admitted to the study wards received the booklet during their first non-emergency clinical encounter, usually the initial nursing assessment after admission. Patients were excluded if they suffered severe cognitive or language limitations, were younger 18 years, or were expected to leave hospital within 48 h. Patients were instructed to study the booklet and follow the recommendations. At the end of their hospital stay, patients received a survey together with a pre-paid envelope, usually at the discharge talk. As the survey was completely anonymous, no reminders could be sent. To monitor the response rate, a case record form was completed for each patient who received a booklet. Age, gender and length of stay were documented in this form by ward nurses. Approximately 20 weeks after booklet implementation, nurses and physicians working on the study wards were surveyed (due to rotation of residents, the survey was conducted after 8 weeks at one side). Several group-level non-individual reminders were made (i.e. staff as a group were reminded to complete the survey at ward meetings).

### Survey instruments

The patient and staff surveys were developed based on the literature and prior surveys [10, 11]. The two designed instruments covered three main areas: (a) general attitudes towards

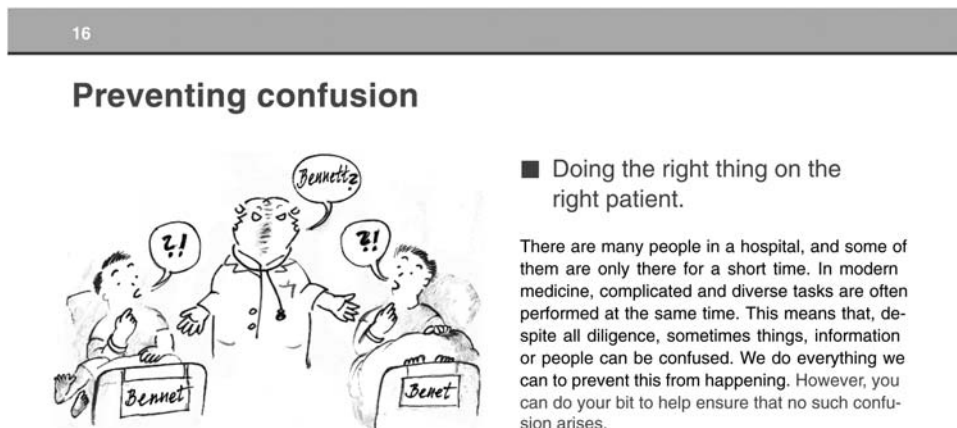


Figure 1 Example page from the booklet.

patient involvement in safety, (b) utilization and evaluation of the booklet and (c) acceptance, adoption and experiences with the recommendations.

In section (a) patients and hcw were asked about their level of agreement with a number of attitudinal statements (both surveys: ‘patients can help to prevent errors’, ‘hospitals should educate patients about error prevention’; healthcare worker survey: ‘the booklet positively affects patients safety’, ‘it is positive if patients apply the recommendations’) [12]. Hcw were asked their level of support for the safety advisory being distributed to patients in their hospital. In chapter (b) patients were asked whether they read the booklet, whether they talked about the safety advices, whether they learned things they did not know before, and whether their awareness and behavior in hospital had changed due to the booklet. Hcw were asked how frequently they discussed the booklet with patients and with colleagues. Both patients and hcw rated the quality of several dimensions of the advisory (e.g. content, illustration) and whether they believed that adoption of the recommendations would prevent errors. Section (c) of the patient survey asked patients about the acceptability of five particular recommendations given in the booklet and whether they had already taken these actions during their current stay. These recommendations were ‘to ask staff to wash their hands’, ‘to ask the purpose of a medication’, ‘to provide staff information about regular medications’, ‘to notify staff about an error’ and ‘to ask for a discharge report’. Potential barriers that hindered them to apply the safety advices were assessed. Patients were then asked to rate their experiences with taking the suggested safety actions, how staff responded to them, and what would help them to apply the advices. Hcw were asked whether patients had approached them personally with one or more of the five recommendations during the past 4 weeks. Additional items asked whether hcw observed specific changes in patients’ behaviors since the booklet was disseminated and whether they experienced effects on their work (e.g. time requirements, relationship to patients). Both patients and hcw were surveyed about whether any errors were prevented by the booklet. The patient survey also included a section (d) to measure attitudes (three instrumental and three affective attitude items), perceived behavioral control (two items), subjective norms (two items) and intentions (two items) towards the behavior of interest, i.e. taking the recommended actions. These items are based on the Theory of planned behavior and were taken from a recent patient survey in oncology [11, 13]. Finally, patients’ concerns for safety were assessed using an item from a Swiss Patient Safety Survey [14]. The majority of items included a seven-point Likert response scale with only anchors labelled. We used this scale format to allow for more variation among moderate positions and to generate more discrimination across items of multi-item scales [15]. The labels were ‘strongly disagree’ or ‘very bad’ (1) and ‘strongly agree’ or ‘very good’ (7).

### Data analysis

Data were analyzed using descriptive statistics. For multiple-item constructs mean scale scores were computed

by dividing the sum scores by the number of items adjusted for missing values.  $\chi^2$  tests and *t*-tests were used for group comparisons, whenever appropriate. Multiple logistic and censored Tobit regression analyses were used to model healthcare worker support for the campaign (dichotomized) and predict patients’ intentions to engage in safety-related behaviors, respectively. Tests were two-sided. A *P*-value of <0.05 was considered statistically significant.

## Results

A total of 2494 patients were provided the booklet, of which 2447 received the survey (98%) and 1053 responded (overall response rate 43%, range across hospitals: 34–87%). Table 1 reports survey responders’ details. Compared with all patients who received the booklet, responders were slightly older (52.7 vs. 51.4 years, *P* = 0.027) and less likely to be female (64.9 vs. 70.8%, *P* < 0.001). The fraction of patients hospitalized for four or more days was 91% among responders, but only 67% in the entire sample (*P* < 0.001). Of 537 hcw, 275 returned the completed survey (overall response rate 51%, range across hospitals 36–80%). Hcw mean age was 36 years and 88.2% were female. 79% of responders were nurses, 13% were doctors with the remaining having other professional backgrounds. Thirteen percent were clinicians with managerial duties (e.g. head nurses, senior physicians).

### General attitudes towards patient involvement in safety

Both hcw and patients shared positive attitudes towards patient education in error prevention though hcw ratings

**Table 1** Self-reported characteristics of patient responders (*n* = 1053)

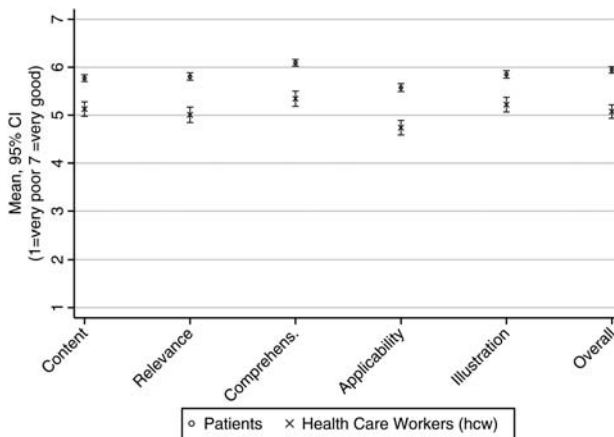
Characteristic	% Patients
Age, years (mean (SD))	52.8 (19.1)
18–25	6.1
26–40	28.0
41–55	19.0
56–70	24.8
>70	22.1
Female gender	64.9
Education	
Primary education	8.1
Secondary education	62.2
Tertiary education	29.7
Primary language other than the national language in the hospital’s geographic region	20.1
Length of stay, days	
1–3 days	9.1
4–7 days	53.2
>7 days	37.7

were considerably lower. Ninety-one percent of patients and 76% of hcw agreed (strongly) that patients can help to prevent errors (patients' mean score = 6.3, confidence interval (CI) 6.3–6.4; hcw mean score 5.6, CI 5.4–5.8,  $P < 0.001$ ) and 95% of patients and 78% of hcw respectively agreed (strongly) that hospitals should educate patients on how to prevent errors (patients' mean score = 6.5, CI 6.4–6.5; hcw mean score 5.7, CI 5.5–5.9,  $P < 0.001$ ). Of surveyed hcw 73% reported a positive attitude towards patients who apply the recommended actions and 70% rated it (very) positive that the booklet was distributed in their hospitals.

### Utilization and evaluation of the booklet

Of patient responders, 75% reported to have read the entire booklet, 19% parts of it, with the remaining 6% looked through the booklet. Forty percent talked with other people

(relatives, staff, patients) about the booklet. Seventy-one percent responded they had learned things in the booklet they did not know before. Patients' evaluations of several dimensions of the booklet were very positive (Fig. 2). Hcw ratings were significantly lower for all aspects but followed a similar pattern. Eighty-six percent of patients and 60% of hcw believed that adoption of the recommendations would prevent errors (patients' mean score = 6.0, CI 5.9–6.1; hcw mean score 4.8, CI 4.6–5.0,  $P < 0.001$ ). Patients felt that awareness for their safety in hospital had changed by reading the booklet (15% strongly; 53% partly) and 51% perceived changes in behaviour (7% strongly; 44% partly). Hcw were more likely to have discussed the booklet with colleagues (10% frequently, 51% rarely, 39% never) than with patients (3% frequently, 46% rarely, 51% never). 60.2% of patients did not discuss the advisory with anyone. 25.1% talked to their relatives, 11.1% talked to hcw, 6.7% talked to other patients and 4.3% talked to others about the booklet.



**Figure 2** Staff and patient ratings of several dimensions of the booklet. Markers represent mean ratings with 95% CIs. All differences between hcw and patient ratings are statistically different at  $P < 0.001$ .

### Acceptance, adoption and experiences with the recommendations

Hcw and patients were surveyed regarding their experience with five behaviours recommended in the booklet. The recommendations were well accepted by a majority of patients and a considerable fraction had taken these actions during their hospital stay (Table 2). For example, more than one quarter notified staff about potential errors in their care and 80% felt comfortable to follow this advice at future occasions. Across the five recommended actions, the mean scores for acceptance and actual adoption of the activity were 6.0 and 4.3, respectively ( $P < 0.001$ ).

Hcw were surveyed about the frequency of patients approaching them personally with the same five actions during the preceding four weeks (measured on a seven-point Likert scale with 1 = never and 7 = very frequently). The most frequent patient behaviours reported by hcw were 'patients informed me about medications they usually take'

**Table 2** Patients' self-reported acceptance and adoption of five recommendations in the booklet ( $n = 1053$ )

Recommended action	Acceptance <sup>a</sup>			Adoption <sup>b</sup>			$P^c$
	Yes (%)	No (%)	Mean [CI]	Yes (%)	No (%)	Mean [CI]	
To ask staff to wash their hands	47.8	18.7	4.9 [4.9–5.1]	16.1	74.7	2.3 [2.1–2.4]	<0.001
To ask staff the purpose of a medication	87.4	1.7	6.6 [6.5–6.6]	71.7	13.6	5.8 [5.6–5.9]	<0.001
To inform staff about medications that are usually taken	89.1	1.3	6.6 [6.5–6.7]	75.1	13.9	5.8 [5.7–6.0]	<0.001
To notify staff about an error (e.g. a wrong medication or a confusion)	80.1	7.4	6.1 [6.0–6.2]	27.6	60.7	3.1 [2.9–3.2]	<0.001
To ask for a copy of the discharge report	69.9	11.6	5.7 [5.6–5.9]	43.6	49.5	3.8 [3.6–4.0]	<0.001

<sup>a</sup>Survey item asked patients whether they would feel comfortable to follow the recommendations during a future hospital stay.

<sup>b</sup>Survey item asked patients whether they took the recommended action during their current hospital stay. Items were measured on a seven-point Likert scale (ranging from 1 'No' to 7 'Yes'; the central category was labelled 'partly'). For the % of positive and negative responses, the two top and bottom categories were merged.

<sup>c</sup>Two-sided *t*-test for difference in means between 'acceptance' and 'adoption' items.

(mean = 4.0, CI 3.8–4.2) and ‘patients asked me the purpose of a medication’ (mean = 4.0, CI 3.8–4.2). Less frequent behaviours observed by hcw were ‘patients asked me for a copy of the discharge report’ (mean = 2.8, CI 2.5–3.0), ‘patients notified me about an error’ (mean = 1.8, CI 1.6–1.9) and ‘patients asked me to wash my hands’ (mean = 1.3, CI 1.2–1.4).

‘Fear of negative staff reactions’ (11.5%) was reported as the main barrier to applying the safety advices by patients followed by ‘health limitations’ (6%). Females (Odds ratio (OR) 2.3, CI 1.4–3.9,  $P = 0.002$ ), younger patients (OR for every year 0.98, CI 0.97–0.99,  $P < 0.001$ ) and those with tertiary education (OR 2.2, CI 1.5–3.3,  $P < 0.001$ ) were more likely to report concerns for staff responses to their intervening. *Ceteris paribus*, the predicted probability that a 30-year-old female patient with tertiary education reported fears of staff reactions ( $P = 0.28$ ) is considerably higher compared with a 70-year-old male with primary or secondary education ( $P = 0.03$ ; difference in predicted probability 0.25, CI 0.18–0.32). When asked what would be most supportive for putting the safety recommendations into practice, 62% of patients answered that this would be the ‘personal instruction and motivation by staff’. Considerably less patients regarded ‘wall-mounted posters’ (32%) or ‘seeing other patients applying the recommendations’ (18%) as encouraging. However, most patients (82%) rated their experiences with applying the recommendations as (very) good (mean score = 5.8, CI 5.7–5.9). Hcw responses to their activities was regarded (very) positive by 89% of patients (mean score = 6.2, CI 6.1–6.3).

Hcw were ambiguous about patients’ overall reactions to the booklet. Forty percent rated patients’ responses as (very) positive, 18% as (very) negative and a relative majority of 42% rated it as indifferent (mean rating = 4.3, CI = 4.1–4.4). In addition, hcw perceived only minor effects of the campaign on patients’ behaviours and their personal work situation. Patients’ increased vigilance, improved communication between patients and providers, and time requirements were the most relevant consequences reported by hcw (Table 3). Hcw and patients differed in their judgments about the effectiveness of the safety recommendations: 16% of hcw and 31% of surveyed patients agreed (strongly) that errors were in fact prevented as a result from the campaign (mean hcw = 3.4, CI 3.2–3.6; mean patients = 3.8, CI 3.6–3.9,  $P = 0.01$ ).

**Attitudes, perceived behavioral control, subjective norms and intentions towards applying the safety recommendations**

Patients’ responses to the perceived behavioral control, norms and intention items are summarized in Table 4. Patients shared a high level of perceived behavioral control and had strong intentions to apply the safety recommendations. However, subjective norms and, in particular, expectations attributed to staff, were considerably lower. Fifteen percent of patients disagreed (strongly) that hcw would expect them to apply the safety recommendations. Figure 3 shows patients’ mean responses to the six attitude items

**Table 3** Staff reported effects of the booklet on patients’ behaviours and own work situation ( $n = 275$ )

	% Agree (strongly) <sup>a</sup>	Mean [CI]
Since the booklet is disseminated, patients		
Ask more questions	12	2.5 [2.3–2.7]
Provide more information	10	2.4 [2.2–2.6]
Are more vigilant	19	2.8 [2.6–3.0]
Are more concerned	8	2.1 [1.9–2.3]
Are less respectful	3	1.7 [1.5–1.8]
Have higher expectations	14	2.4 [2.2–2.6]
That the booklet is disseminated to patients		
Makes my work easier	11	2.6 [2.4–2.8]
Requires additional time, e.g. for answering questions	32	3.5 [3.2–3.7]
Improves communication with patients	23	3.0 [2.8–3.2]
Causes suspiciousness	17	2.7 [2.5–2.9]
Stimulates my relation to patients	18	2.9 [2.7–3.1]
Causes unpleasant situations	8	2.2 [2.0–2.4]

<sup>a</sup>Items were measured on a seven-point Likert scale (anchored 1 ‘Strongly disagreed’ and 7 ‘strongly agree’). For the fraction that ‘agreed (strongly)’ responses in the three top categories were merged.

(mean scale score = 5.8, CI = 5.8–5.9). The mean score of the instrumental attitude items (three top items in Fig. 3) was significantly higher as compared with the mean affective attitude items score (6.1 vs. 5.6,  $P < 0.001$ ).

Patients’ intentions to apply the safety recommendations were modeled using censored regression methods (McFadden’s  $R^2 = 0.3$ ; McKelvey & Zavoina’s  $R^2 = 0.63$ ). As suggested by the theory of planned behavior, intentions to apply the safety advices were predicted by perceived behavioral control (mean perceived behavioral control items  $\beta = 0.67$ , CI 0.59–0.75,  $P < 0.001$ ), subjective norms (mean norm items  $\beta = 0.28$ , CI 0.22–0.35,  $P < 0.001$ ) and attitudes (mean attitude items  $\beta = 0.12$ , CI 0.03–0.21,  $P = 0.009$ ). In addition, safety behaviors during the current stay (mean adoption scale score  $\beta = 0.10$ , CI 0.04–0.16,  $P = 0.002$ ) and experiences with putting the recommendations into practice ( $\beta = 0.18$ , CI 0.10–0.27,  $P < 0.001$ ) determined patients’ intentions to follow the safety recommendations in the future.

**Predictors for hcw support for the campaign**

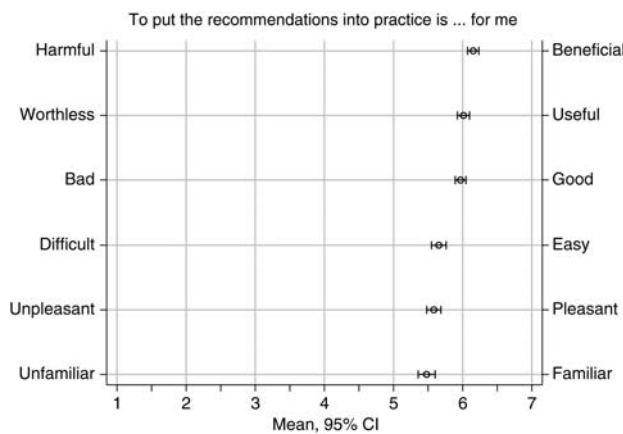
In multiple logistic regression analysis, determinants for hcw support for the campaign were identified (Model  $R^2$ : 0.42). The overall rating of the booklet (OR for a single unit of the Likert scale 3.4, CI 1.8–6.1,  $P < 0.001$ ), the belief that the recommendations will prevent errors (OR for a single unit of

**Table 4** Patients' perceived behavioral control, subjective norms, and intentions towards applying the safety recommendations ( $n = 1053$ )

	% Agree (strongly) <sup>a</sup>	Mean [CI] <sup>b</sup>
Perceived behavioral control items (scale score) <sup>b</sup>		
I am confident I can take the safety actions recommended in the booklet	81	5.9 [5.9–6.0]
I am sure I could take the safety actions recommended in the booklet if I wanted to	87	6.1 [6.0–6.2]
Subjective norms items (scale score) <sup>b</sup>		
Staff in this hospital expects me to take the safety actions recommended in the booklet.	67	5.25 [5.14–5.4]
It is approved in this hospital that I take the safety actions recommended in the booklet	81	5.8 [5.7–5.9]
Intentions items (scale score) <sup>b</sup>		
Next time I go to hospital I will take the safety actions recommended in the booklet	87	6.1 [6.0–6.1]
I intend to take the safety actions recommended in the booklet in the future	90	6.11 [6.03–6.19]

<sup>a</sup>Items were measured on a seven-point Likert scale (anchored 1 'Strongly disagreed' 7 'strongly agree'). For the fraction that 'agreed (strongly)' responses in the three top categories were merged.

<sup>b</sup>Scale scores were calculated by dividing the sum scores by the number of items adjusted for missing values.



**Figure 3** Patients' instrumental (three top items) and affective (three bottom items) attitudes towards applying the safety recommendations. Markers represent mean ratings with 95% CIs.

the Likert scale 1.7, CI 1.2–2.5,  $P = 0.007$ ), the perception of increased vigilance of patients (OR for a single unit of the Likert scale 1.9, CI 1.1–3.3,  $P = 0.034$ ) and the experience that the booklet causes unpleasant situations (OR for a single unit of the Likert scale 0.6, CI 0.4–1.0,  $P = 0.035$ ) were significant predictors for hcw level of agreement with the booklet being disseminated at their place of work.

## Discussion

Patient engagement in safety is advocated by several organizations worldwide but knowledge regarding patients' and hcw evaluations of and experiences with such campaigns is limited. Many advisories are not based on patients' perspectives, lack cultural and realistic integration into the healthcare

setting, provide little practical support for patients and have often not been tested prior to dissemination [16]. As reported by Waterman *et al.* [12], we found strong positive attitudes towards the patients' involvement in prevention of medical errors among patients, and can extend this evidence further to healthcare staff. While the majority of hcw were supportive of engaging patients for their safety, the level of support was lower as compared with patients. This may reflect safety climate, e.g. a general reluctance to communicate openly about errors and safety, or, in particular towards patients. Ambivalence among hcw towards approaches that foster patient engagement however, is not surprising since unfamiliar or difficult situations can indeed arise. For example, to ask staff to wash their hands does not only require patients but also hcw to adopt a new model of patient-provider-relation and deal with situations that are not being taught. Taking these considerations into account, the level of support for patient involvement in safety seems quite high.

The newly developed booklet received very positive ratings, in particular in terms of comprehensibility, and was well accepted by patients and staff. A considerable fraction of patients reported changes in knowledge, vigilance and behavior. Many patients applied the recommendations and nearly one-third believed that errors were in fact prevented by the use of the booklet. Hcw were affirmative towards the intervention and its error prevention potential but reported only minor impact on their work. Many of the concerns articulated by staff and department leaders prior to the pilot study, e.g. confrontational situations and culture of 'suspicion', were thus not confirmed by actual experiences which is a positive outcome. Time requirements and improved communication with patients were the most common reported consequences. It is evident that involvement of patients requires communication about safety which in turn needs time. While the provision of the advisory can serve as a 'door opener' to overcome the silence regarding safety

between patients and how it is a supplement to direct communication, not a substitute. Differences in the perceptions of patients and how require further research. Our results imply that considerable effects on awareness and behavior reported by individual patients sum up to a smaller magnitude of 'change' in the perception of how.

Two-thirds of how in our sample appreciated that the booklet was disseminated at their institution. A positive rating of the quality of the booklet was the strongest predictor for supporting the campaign while age, gender, profession, general attitudes in favor of patient preventability, personal experiences with patients' responses to the booklet and time requirements were not associated with support. This suggests that development of material accepted by staff combined with interventions to adequately prepare how and make them familiar with the material is a vital though resource-intensive step in patient involvement campaigns. Though one-third of how responders reported that the dissemination of the advisory required additional time (e.g. to respond to patients' requests) this experience did not alter their support for the campaign. Contrary, unpleasant situations were reported by only few how, but had a significant small negative impact on their commitment. In other words, how remained supportive to patients' involvement in safety even if communication efforts were required, as long as these investments were experienced as positive encounters. This also highlights the important role of continuous staff support. Initial teaching may not be sufficient and should be supplemented by periodical meetings for discussing experiences and providing assistance in dealing with difficult situations.

We observed a large variation in the adoption of different recommendations as reported by patients: More than 70% of patients reported to have discussed medications with staff, one quarter notified staff about a potential error, and 16% reported to have asked staff to wash their hands. This is not surprising given the varying frequency of situations to which the recommendations apply. For example, patients are more likely to experience medication issues than potential errors. However, variation in the 'anticipated' adoption of the behaviours at future occurrences confirmed that behaviours in line with the traditional patient role were more acceptable than behaviours that question norms [7, 17, 18]. Perceived norms, i.e. whether patients feel that their engagement for safety is expected and appreciated, were also an important predictor for patients' intentions to follow the safety recommendations in the future. Norms attributed to staff have been identified as a main force in chemotherapy patients' participation in error prevention strategies earlier [11, 19]. The current study extends this evidence to broad patient populations with single hospitalizations and less tight relations to healthcare providers. In concordance with previous research, perceived behavioral control was the key predictor for patients' intentions to engage in safety in our study [20, 21]. Neither patients' beliefs that errors had been prevented due to their safety behaviors or their concerns for safety, nor gender, age or education were significantly associated with intentions to act. Future research is clearly needed to explore whether and how behavioral control can be influenced by communication within the acute healthcare setting.

Patients in our study strongly acknowledged the benefits of engaging for their safety (instrumental attitudes) but evaluated the process of taking action emotionally less positively (affective attitudes). Many responders, mainly young and well-educated patients, reported anticipating negative staff reactions as a barrier to engaging in safety behaviors. A majority of all patients identified a personalized instruction, i.e. being personally instructed by staff and motivated to speak up rather than just being given the booklet, as a key component to overcome these barriers. Our results suggest that patients are prepared to engage for their safety. Providing patients with a suitable, sensitively balanced educational material that is well accepted by patients and staff is an important initial step to foster motivation. To be successful and effective in the long-run, this material needs to be accompanied by measures that target norms and barriers in patients, and acknowledge and support how in dealing with difficult situations.

Our study has some limitations that need to be addressed: First, response rates to the surveys were not satisfactory. A number of reasons may help to explain the low response rate among patients. Patients received the survey at discharge, and no reminders were sent. Patients may have been too busy and concerned with the discharge process. The broad inclusion criteria for provision of the advisory are also likely to have systematically affected the participation rate in the survey. As the booklet explicitly addresses safety concerns of patients' significant others, staff was instructed to be very non-restrictive in the diffusion of the booklet, e.g. to patients with limited language proficiency or cognitive disabilities, based on the assumption that relatives may then use the advisory. But as relatives were not surveyed, the response rate would decrease. Finally, patients with shorter length of stay, female, and younger patients were less likely to respond to the survey. This is also reflected by the significantly lower response rate among patients recruited from the obstetrics department of the university hospital (34%). Many of these patients are hospitalized for giving birth for only 2–3 days. It seems likely that these young women felt that learning about patient safety may be of little relevance to them at their current hospital stay. The fact that the response rate among how of this department was also significantly lower (36%) compared with other departments may indicate that this perception is shared by staff. The large range in the response rates across hospitals indeed indicates that survey non-response is an outcome of particular local survey logistics, or clinical and cultural attributes of the participating departments, their patients and staff rather than a general reaction towards the booklet. A second limitation is that we only assessed subjective, self-reported effects of the booklet. For example, we do not know whether patients' awareness and behaviors in fact changed. However, patients' and how reports of the relative frequency of adoption of five particular safety recommendations were in well concordance. This agreement suggests that at least these particular self-reported behaviors were largely unaffected by over- or underestimation. Finally, we do not know whether the dissemination of the booklet in fact improved patient safety, though this was

reported by a substantial fraction of staff and patients. Future studies will address the effectiveness of the booklet under comparative study conditions.

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## Ethics Approval

The study obtained ethical approval by the three local Ethics Committees (ref. kek-zh-nr: 2009-0076/0; kek-ag-nr: 2009172; kek-vd-nr: 09/10).

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