



ORIGINAL ARTICLE

## Patient safety culture in Norwegian primary care: A study in out-of-hours casualty clinics and GP practices

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### Abstract

**Objective.** This study aimed to investigate patient safety attitudes amongst health care providers in Norwegian primary care by using the Safety Attitudes Questionnaire, in both out-of-hours (OOH) casualty clinics and GP practices. The questionnaire identifies five major patient safety factors: Teamwork climate, Safety climate, Job satisfaction, Perceptions of management, and Working conditions. **Design.** Cross-sectional study. Statistical analysis included multiple linear regression and independent samples t-tests. **Setting.** Seven OOH casualty clinics and 17 GP practices in Norway. **Subjects.** In October and November 2012, 510 primary health care providers working in OOH casualty clinics and GP practices (316 doctors and 194 nurses) were invited to participate anonymously. **Main outcome measures.** To study whether patterns in patient safety attitudes were related to professional background, gender, age, and clinical setting. **Results.** The overall response rate was 52%; 72% of the nurses and 39% of the doctors answered the questionnaire. In the OOH clinics, nurses scored significantly higher than doctors on Safety climate and Job satisfaction. Older health care providers scored significantly higher than younger on Safety climate and Working conditions. In GP practices, male health professionals scored significantly higher than female on Teamwork climate, Safety climate, Perceptions of management and Working conditions. Health care providers in GP practices had significant higher mean scores on the factors Safety climate and Working conditions, compared with those working in the OOH clinics. **Conclusion.** Our study showed that nurses scored higher than doctors, older health professionals scored higher than younger, male GPs scored higher than female GPs, and health professionals in GP practices scored higher than those in OOH clinics – on several patient safety factors.

**Key Words:** Adverse events, general practice, medical errors, Norway, out-of-hours, patient safety culture, primary care, Safety Attitudes Questionnaire

### Introduction

Medical errors and patient safety issues have been addressed in hospital care settings for several years [1–6]. Recently, there has also been an increasing interest in patient safety in primary care.

As a branch of organizational culture, safety culture refers to individual and group values, attitudes, perceptions, and patterns of behaviour that specifically determine the organization's commitment to, and management of, safety [7,8]. In organizational

psychology research, culture is described by both qualitative and quantitative methods [9]. Quantitative surveys have concentrated on measuring staff perceptions, which are referred to as organizational climates.

Organizational climates are mathematical expressions of how members in natural social units perceive that cultural norms are enacted by leadership and members in the unit. These climates are measured according to both level of mean and the degree to

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Patient safety culture is how leader and staff interaction, attitudes, routines, and practices in a group setting may protect patients from adverse events.

- In out-of-hours clinics, nurses scored higher than doctors, and older health professionals scored higher than younger on patient safety factors.
- Male professionals in GP practices scored significantly higher than female on four of the patient safety factors.
- Health care providers in GP practices had higher patient safety factor scores than those working in out-of-hours clinics.

which staff share the perceptions, which is the organizational climate strength [10]. Organizational climates with diverging perceptions amongst staff are regarded as weak, with limited power to predict staff practices [11].

The Safety Attitudes Questionnaire (SAQ) is the most widely used instrument to measure safety attitudes among health professionals [12]. Measurement of safety climate with the SAQ provides information on both climate level and strength [13]. When safety culture is measured using questionnaires, the items are sorted into factor scales reflecting an array of organizational dimensions relevant to safety.

Valid SAQ measurements may identify weaknesses in a clinical setting, and motivate interventions to reduce the risk of medical errors [14–16]. The hospital version of the SAQ has been translated and validated in a number of different countries, including Norway [17].

In 2007, Modak et al. described the first questionnaire for measuring patient safety culture in the primary care setting, by developing the Safety Attitudes Questionnaire – Ambulatory Version (SAQ-AV) [1]. The Norwegian translated version of the SAQ-AV has recently been validated, and confirmed five major patient safety factors: Teamwork climate, Safety climate, Job satisfaction, Perceptions of management, and Working conditions [18].

In this paper we wanted to study whether variations in safety attitudes may be related to professional background, gender, age, and the clinical setting in Norwegian primary care.

## Material and methods

### Setting

The present study was undertaken both in OOH casualty clinics and in GP practices. Seven representative

OOH clinics in Norway function as specially designated “Watchtower Clinics” established to deliver research data [19,20]. In addition, all GP practices in the county of Sogn & Fjordane were invited to participate in the study.

### Subjects

In order to protect the confidentiality of the respondents, we included only clinics and practices employing at least five health professionals. For this reason, we replaced one of the seven Watchtowers with the OOH clinic in the neighbouring municipality. The seven OOH clinics in our study employed a total of 337 health professionals – 231 doctors and 106 nurses – serving a total population of 251 000.

Seven of the 30 GP practices in Sogn & Fjordane County were not included, as they had fewer than five employees. Of the remaining 23 practices, 17 agreed to participate. These 17 GP practices employed a total of 173 health professionals: 85 doctors and 88 support medical staff. The professional background of the support medical staff included registered nurses, medical secretaries, and bioengineers. In this paper, we use the term “nurses” for this group. The participating GP clinics served a population of 70 000.

### Questionnaire

There are two Norwegian versions of the SAQ-AV, one for OOH casualty clinics and one for GP practices, with only minor modifications according to the setting [18]. It is a 62-item questionnaire where the respondents rate their agreement using a five-point Likert scale.

### Data collection

In October and November 2012, the SAQ-AV was distributed electronically to all 510 health care providers in the 24 participating OOH clinics and GP practices. Data were collected using the program QuestBack, whereby the participants responded anonymously.

### Statistical analysis

The QuestBack file with anonymous SAQ-AV data was converted into an SPSS file (version 18) for further analysis. Statistical analysis included multiple linear regression and independent samples t-tests. The Kolmogorov–Smirnov normality distribution test p-values for the five dimensions were all below 0.001, indicating that the dimensions were not

normally distributed. However, in large samples these tests are often significant even when the scores are only slightly different from a normal distribution. Kolmogorov–Smirnov p-values should therefore be interpreted in conjunction with size of sample, histograms, P–P or Q–Q plots, and values of skew and kurtosis [21]. Our sample was a reasonably large one, its P–P and Q–Q plots were as curving as could be expected from the p-values, but – although all five distributions were somewhat skewed towards the high end of the scale – the histograms did not deviate dramatically from the superimposed normal distribution curve. The distributions' skew and kurtosis values were low, and no scores were distant outliers in the sense of being beyond  $\pm 3.3$  standard deviations from the distributions' average scores. We therefore deemed the dimension scores appropriate for multiple regression analysis.

#### Ethical considerations

This study was conducted in compliance with the ethical guidelines of the Helsinki Declaration. All participants received written information about the purpose of the study, and that the data would be collected anonymously and treated in confidence. The study was approved by the Norwegian Social Science Data Services – the governmental agency for protecting survey research respondent privacy according to the Norwegian Personal Data Act (Ref. No. 2012/30774).

#### Results

Of the 510 invited health care providers, 266 (52%) answered the questionnaire: 72% of the nurses (n = 139) and 39% of the doctors (n = 124). Professional status is not known for three of the respondents. The response rate was higher among doctors

in GP practices (55%) than doctors in OOH clinics (33%), while the corresponding rates for nurses were 73% and 71%, respectively.

Basic characteristics of the participating subjects are given in Table I. The mean scores for the five patient safety factors – by profession, gender, and age – are presented in Table II (OOH clinics) and Table III (GP practices). The p-values are obtained from multiple linear regression analyses adjusted for profession, gender, and age. In the OOH clinics, nurses scored significantly higher than doctors on Safety climate and Job satisfaction. Older health care providers scored significantly higher than younger on Safety climate and Working conditions.

In the GP practices, after adjusting for profession and age, male health professionals scored significantly higher than female on Teamwork climate, Safety climate, Perceptions of management, and Working conditions.

Independent samples t-tests showed that male doctors in GP practices scored significantly higher than female GPs in four of the patient safety factors: Teamwork climate, male 88.5, female 75.9,  $p = 0.02$ ; Safety climate, male 85.4, female 67.9,  $p = 0.02$ ; Perceptions of management, male 84.4, female 67.7,  $p = 0.02$ ; and Working conditions, male 85.7, female 71.9,  $p = 0.02$ . Among the OOH doctors, there were no significant gender differences in mean factor scores.

Health care providers in GP practices had higher mean scores than their colleagues in the OOH clinics on each of the five patient safety factors. In multiple linear regression analyses adjusted for profession, gender and age, the difference in mean score was significant for the factors Safety climate (77.2 vs. 69.6,  $p = 0.01$ ) and Working conditions (76.2 vs. 69.2,  $p = 0.02$ ), with a similar – although not significant – tendency for Job satisfaction (87.6 vs. 83.4,  $p = 0.06$ ).

Table I. Characteristics of 266 primary health care providers working in seven out-of-hours casualty clinics (n = 154) and 17 GP practices (n = 112), responding to the Safety Attitudes Questionnaire – Ambulatory Version.

	OOH doctor n (%)	OOH nurse n (%)	GP doctor n (%)	GP nurse n (%)	Missing (n)
Gender					7
Female	27 (37)	71 (95)	13 (28)	62 (98)	
Male	47 (64)	4 (5)	34 (72)	1 (2)	
Age (years)					4
$\leq 30$	10 (13)	4 (5)	9 (19)	4 (6)	
31–40	33 (43)	29 (39)	17 (36)	11 (17)	
41–50	11 (14)	24 (32)	5 (11)	23 (36)	
51–60	17 (22)	14 (19)	12 (26)	21 (33)	
$\geq 61$	6 (8)	3 (4)	4 (9)	5 (8)	

Note: Proportions (%) not including missing data.

Table II. Mean scores for five patient safety factors in seven out-of-hours casualty clinics, by profession, gender, and age.

		n	Mean (SD)	p-value*
Teamwork climate	Total	136	77.6 (14.2)	
	Profession:			0.54
	Nurse	71	79.3 (12.4)	
	Doctor	63	76.1 (15.9)	
	Gender:			0.57
	Female	88	78.9 (13.0)	
	Male	43	76.0 (16.2)	
	Age (years):			0.43
	≤ 30	12	77.1 (12.7)	
	31–40	57	77.4 (13.5)	
	41–50	30	77.4 (12.7)	
Safety climate	Total	144	69.6 (18.1)	
	Profession:			<b>0.01</b>
	Nurse	70	75.4 (16.2)	
	Doctor	72	64.3 (18.4)	
	Gender:			0.69
	Female	92	72.5 (17.4)	
	Male	47	65.7 (18.9)	
	Age (years):			<b>0.03</b>
	≤ 30	11	64.0 (14.6)	
	31–40	60	66.3 (17.6)	
	41–50	32	73.9 (18.8)	
Perceptions of management	Total	135	76.0 (17.6)	
	Profession:			0.34
	Nurse	68	78.3 (17.1)	
	Doctor	65	73.7 (18.2)	
	Gender:			0.81
	Female	87	77.0 (17.1)	
	Male	43	74.1 (19.5)	
	Age (years):			0.19
	≤ 30	11	69.6 (10.6)	
	31–40	56	75.4 (16.3)	
	41–50	29	75.9 (18.2)	
Job satisfaction	Total	149	83.4 (16.1)	
	Profession:			<b>0.01</b>
	Nurse	73	88.2 (14.2)	
	Doctor	74	79.1 (16.7)	
	Gender:			0.77
	Female	94	85.9 (14.4)	
	Male	50	80.0 (18.6)	
	Age (years):			0.19
	≤ 30	14	81.4 (18.9)	
	31–40	61	82.5 (13.3)	
	41–50	33	84.2 (17.6)	
Working conditions	Total	136	69.2 (21.2)	
	Profession:			0.46
	Nurse	68	72.1 (22.5)	
	Doctor	66	66.5 (19.9)	
	Gender:			0.56
Female	85	71.0 (22.1)		
Male	46	67.4 (19.4)		

(Continued)

Table II. (Continued)

	n	Mean (SD)	p-value*
Age (years):			<b>0.02</b>
≤ 30	13	62.5 (16.5)	
31–40	54	65.2 (22.7)	
41–50	27	71.5 (21.0)	
51–60	30	76.9 (21.3)	
≥ 61	9	71.5 (15.0)	

Notes: \*p-values obtained from multiple linear regression model adjusted for the variables included in each of the five patient safety factors. p-values < 0.05 indicating statistical significance in bold.

### Discussion

Our study showed significant variations in patient safety attitudes, related to professional background, age, gender, and clinical setting. In the OOH clinics, nurses scored significantly higher than doctors on the factors Safety climate and Job satisfaction. Older health care providers scored significantly higher than younger on Safety climate and Working conditions. Male health professionals in GP practices scored significantly higher than female on four of the patient safety factors. Finally, health care providers in GP practices had significant higher mean scores on the factors Safety climate and Working conditions, compared with those working in the OOH clinics.

Several instruments have been developed to measure patient safety attitudes among health professionals [1,22–25]. The SAQ is most commonly used, and scores from this questionnaire have been shown to correlate with patient outcome [13,26–28].

A strength of the present study is that it was performed in a representative sample of OOH clinics in Norway. In addition, the Norwegian version of the SAQ-AV has not previously been used in GP practices. A patient safety culture study may in itself have a positive impact, as discussing the results locally, at clinic level, may facilitate strategies to reduce the risk of medical errors [14–16].

The overall response rate was 52%. It was almost twice as high among nurses (72%) compared with doctors (39%). The response rate was higher among doctors in GP practices (55%) than doctors in OOH clinics (33%). As GPs commonly spend more working hours in GP practices than most OOH doctors do in casualty clinics, the higher response rate increases the validity of the patient safety assessment in general practice. OOH doctors usually have a poorer linkage to the casualty clinics, meaning that the rather low response rate should not reduce the validity of the patient safety assessments in these clinics very much.

Nurses are employed more often than doctors in only one clinic. The high response rates among nurses in both GP practices (73%) and OOH clinics (71%),

Table III. Mean scores for five patient safety factors in 17 GP practices, by profession, gender, and age.

		n	Mean (SD)	p-value*
Teamwork climate	Total	99	79.6 (15.9)	
	Profession:			0.53
	Nurse	53	75.6 (16.8)	
	Doctor	45	85.1 (12.3)	
	Gender:			<b>0.04</b>
	Female	64	75.8 (16.6)	
	Male	34	87.9 (9.2)	
	Age (years):			0.42
	≤ 30	12	77.8 (19.4)	
	31–40	25	81.8 (12.1)	
Safety climate	Total	104	77.2 (17.8)	
	Profession:			0.57
	Nurse	59	75.1 (17.9)	
	Doctor	44	80.6 (17.1)	
	Gender:			<b>0.02</b>
	Female	70	73.9 (18.8)	
	Male	33	85.0 (12.5)	
	Age (years):			0.14
	≤ 30	13	71.2 (21.0)	
	31–40	26	77.2 (15.5)	
Perceptions of management	Total	94	76.4 (18.9)	
	Profession:			0.41
	Nurse	55	74.7 (18.7)	
	Doctor	38	79.6 (18.8)	
	Gender:			<b>0.03</b>
	Female	65	73.6 (19.0)	
	Male	28	83.9 (16.6)	
	Age (years):			0.87
	≤ 30	10	75.5 (22.2)	
	31–40	27	77.2 (18.1)	
Job satisfaction	Total	110	87.6 (13.1)	
	Profession:			0.61
	Nurse	63	86.0 (14.5)	
	Doctor	46	90.1 (10.5)	
	Gender:			0.41
	Female	73	86.1 (14.8)	
	Male	35	91.1 (7.5)	
	Age (years):			0.44
	≤ 30	13	83.9 (13.4)	
	31–40	27	90.2 (9.1)	
Working conditions	Total	100	76.2 (18.1)	
	Profession:			0.43
	Nurse	53	70.9 (20.3)	
	Doctor	46	82.1 (13.2)	
	Gender:			<b>0.045</b>
Female	63	70.9 (19.7)		
Male	35	85.4 (9.9)		

(Continued)

Table III. (Continued)

	n	Mean (SD)	p-value*
Age (years):			0.13
≤ 30	12	73.4 (25.4)	
31–40	24	76.8 (12.8)	
41–50	25	68.5 (20.9)	
51–60	30	83.1 (12.7)	
≥ 61	8	75.0 (21.1)	

Notes: \*p-values obtained from multiple linear regression model adjusted for the variables included in each of the five patient safety factors. p-values < 0.05 indicating statistical significance in bold.

strengthens the validity of the patient safety assessments.

In the OOH clinics, nurses scored significantly higher than doctors on the factors Safety climate and Job satisfaction, and older health care providers scored significantly higher than younger on Safety climate and Working conditions. This might be due to a higher degree of attachment to their own working place among nurses and more experienced employees. Many of the nurses spend all their working hours in the OOH clinic, while most of the doctors would have OOH duty as a limited activity in addition to working as GPs. Employees who have worked in OOH clinics for a long period will most likely feel more comfortable in that clinical setting.

In the GP practices, male health professionals scored significantly higher than female on four patient safety factors. It might be that men more often than women experience acceptance regarding their views, and thereby reply more positively on SAQ-AV statements such as “Nurse input is well received in this office” and “In this office, it is difficult to speak up if I perceive a problem with patient care”.

In Norwegian GP practices, doctors are often employers of the nurses. One might expect that health professionals working in leadership positions could be more positive regarding patient safety issues in the practice they are responsible for, compared with the employees. However, we did not find significant differences in mean patient safety factor scores when comparing nurses and doctors in GP practices.

The fact that male GPs had higher patient safety scores than female suggests that female GPs possibly identify more risks. The observed gender difference in our study is in contrast with findings in a Norwegian hospital SAQ study (Akershus University Hospital), where female and male doctors did not have significantly different perceptions of Safety climate, Perceptions of management or Working conditions. On the other hand, female doctors scored significantly higher than male on Teamwork climate

(male 70.9, female 76.3,  $p = 0.047$ ) and Job satisfaction (male 70.4, female 79.5,  $p = 0.003$ ) (ECT Deilkås, personal communication, unpublished results). This is perhaps related to the fact that female and male doctors tend to choose different hospital specialties [29], which have different contexts that may influence job satisfaction. They may also have different expectations and preferences regarding working in teams with other professions.

Health care providers in GP practices had significantly higher scores on the factors Safety climate and Working conditions than health care providers in OOH clinics. As there are higher proportions of acutely ill patients in OOH clinics compared with GP practices, the risk of medical errors is increased – whereby the safety climate might be perceived as poorer in the OOH setting.

The degree to which staff share the perceptions within the same unit is a validity criterion for measurements of organizational climate [30]. The degree of consensus amongst staff in a unit is a measure of the organizational climate's strength [8,30]. Organizational climates with diverging perceptions amongst staff are regarded as weak, with limited power to predict staff practices [11]. The variations found in this study make it relevant to investigate what explains consensus within the clinics and practices explored. We will investigate within-unit variation in a later study.

## Conclusions

Our study showed that nurses scored higher than doctors, older health professionals scored higher than younger, male GPs scored higher than female GPs, and health professionals in GP practices scored higher than those in OOH clinics – on several patient safety factors. Possible reasons for these findings need to be further explored. Patient safety issues should be addressed more systematically in primary health care, in order to identify weaknesses and motivate interventions to reduce the risk of medical errors and negative patient outcomes.

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## Contributors

GTB was responsible for designing the study, developing the Norwegian version of the SAQ-AV

questionnaire, data collection, analysis and interpretation of data, and writing the manuscript.

DH participated in developing the Norwegian SAQ-AV questionnaire, and was responsible for the statistical analysis and interpretation of results, in addition to revising the manuscript critically.

EHH participated in designing the study, developing the Norwegian SAQ-AV questionnaire, data collection, and revising the manuscript critically.

ECTD participated in designing the study, developing the Norwegian SAQ-AV questionnaire, data analyses and interpretation, and writing the manuscript.

All authors read and approved the final manuscript.

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## Declaration of interest

There are no conflicts of interest in connection with the paper. The authors alone are responsible for the content and writing of the paper.

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