



OPEN ACCESS

# Safety culture in long-term care: a cross-sectional analysis of the Safety Attitudes Questionnaire in nursing and residential homes in the Netherlands

Martina Buljac-Samardzic,<sup>1</sup> Jeroen DH van Wijngaarden,<sup>1</sup> Connie M Dekker-van Doorn<sup>2</sup>

<sup>1</sup>Erasmus University Rotterdam, Institute of Health Policy and Management, Rotterdam, The Netherlands  
<sup>2</sup>University of Applied Sciences Rotterdam, Research Centre Innovations in Care, Rotterdam, The Netherlands

**Correspondence to**  
Dr M Buljac-Samardzic,  
Institute of Health Policy  
and Management, Erasmus  
University, P.O. 1738, 3000 DR  
Rotterdam, The Netherlands;  
buljac@bmj.eur.nl

Received 5 December 2014  
Revised 12 June 2015  
Accepted 9 July 2015

## ABSTRACT

**Objective** The first objective was to investigate if the Safety Attitudes Questionnaire (SAQ) is appropriate to measure the safety attitude of caregivers in nursing and residential homes, and second, to compare safety attitude of these caregivers with available data of caregivers in other settings (ie, inpatients, intensive care unit (ICU) and ambulatory care).

**Methods** Using a cross-sectional survey methodology, we obtained completed SAQ surveys from 521 caregivers (response rate of 53%) working in nine units in nine different nursing and residential homes in The Netherlands. Exploratory factor and Cronbach's alpha measures were used to analyse the psychometric properties of the SAQ.

A correlation matrix was performed to study the relationship among the SAQ dimensions. A t test was performed to test significant differences between our sample and the benchmark settings.

**Results** The factor analyses and calculated Cronbach's alphas ( $\alpha=0.56$ – $0.80$ ) for this sample confirmed the robustness of the SAQ scales. There was a high positive correlation between teamwork climate, job satisfaction, perceptions of management, safety climate and working conditions ( $r=0.31$  to  $0.63$ ), but stress recognition had a negative correlation with each of the other dimensions ( $r=-0.13$  to  $-0.18$ ). Overall, the scores from the nursing and residential homes differed significantly from the benchmark settings.

**Conclusions** The findings in this study confirmed that the SAQ could also be used in the nursing and residential homes setting. However, stress recognition in nursing and residential homes setting does not seem to be

one of the dimensions of the safety attitude construct. Furthermore, Dutch nursing and residential homes have significantly higher scores on most dimensions of the SAQ compared with US inpatient units and comparable scores to ICUs (Dutch and US) and ambulatory services.

## INTRODUCTION

Patient safety research has focused mostly on the hospital setting; much less attention is paid to the nursing and residential home settings.<sup>1 2</sup> The most common adverse events in nursing and residential homes are accidental injuries involving clients and staff, pressure ulcers, falls, wounds and medication errors.<sup>1 3</sup> It is commonly believed that the introduction of a safety culture will have a positive impact on safety outcomes.<sup>4</sup> Different initiatives have been developed to improve the safety culture in nursing and residential homes, such as leadership walkarounds and team training. However, few tools are available to evaluate the effectiveness of these initiatives. Little is also known about the current safety culture of nursing and residential homes.

In recent decades, a number of surveys to measure patient safety culture (PSC) in hospital settings have emerged.<sup>5</sup> Colla *et al*<sup>5</sup> reviewed the available surveys that measure PSC. Although their intention was not to endorse one survey over another, it was clear that the Safety Attitudes Questionnaire (SAQ)<sup>6</sup> was the only survey that covered all common dimensions, applicable for multiple settings, performed psychometrically well, suitable for a broad comparison and

**To cite:** Buljac-Samardzic M, van Wijngaarden JDH, Dekker-van Doorn CM. *BMJ Qual Saf* Published Online First: [please include Day Month Year] doi:10.1136/bmjqs-2014-003397

## Original research

associated with patient outcomes.<sup>5</sup> The SAQ assesses the measurable components of safety culture by measuring caregivers' attitudes and perceptions relevant to the safety of healthcare. It measures six important dimensions of a safety culture: teamwork climate, job satisfaction, perception of management, safety climate, working conditions and stress recognition (see table 1). The SAQ is frequently used in different healthcare settings, which enables comparison. To meet the specific characteristics of different healthcare settings, several versions of the SAQ (eg, intensive care unit (ICU), operation room, ambulatory, pharmacy) have been constructed. There is not an adjusted SAQ available for the long-term care overall or specifically nursing or residential homes. It cannot be assumed that the available SAQs are suitable for nursing and residential homes due to the unique characteristics of this setting. An important characteristic of care in nursing and residential homes is that the 'demarcation between healthcare (medical component) and social care (non-medical component) is often blurred'.<sup>7</sup> The majority of the residents in these homes is over 80, and will remain living there for the rest of their life, requiring both medical and social care. Nursing homes provide care especially for people who need 24/7 nursing care. While residential homes focus more on providing social care, 'the care provided in these homes has become more complex over the years and the boundary between nursing homes and residential homes has become more and more diffuse'.<sup>8</sup>

Although research is still scarce, studies have been done on PSC in nursing homes. However, we were only able to find studies done in the USA. In a literature review, Bonner *et al*<sup>9</sup> identified six US studies. All of these studies conclude that some major issues exist

related to PSC in nursing homes in the USA.<sup>9</sup> For example, Castle and Sonon<sup>10</sup> found that nursing homes scored significantly lower on most dimensions compared with hospitals. They distributed the Hospital Survey on Patient Safety Culture (HSOPS) among nurse's aides in nursing homes and later also among nursing home administrators<sup>10</sup> to compare PSC with acute hospital care. Castle *et al*<sup>11</sup> found that nursing staff in US nursing homes 'generally agree that PSC is poor'. They used an adapted version of the HSOPS, especially for nursing homes; Nursing Home Survey on Patient Safety Culture (NHSPSC).<sup>11</sup> In addition, Thomas *et al*<sup>12</sup> showed that higher scores on the NHSPSC were significantly related to lower prevalence of physical restraints and to fewer residents who fell. Most studies argue that 'an uneasiness with discussion and reporting of errors' in nursing homes in the USA is an important cause of the poor PSC.<sup>9 13</sup> Handler *et al*<sup>14</sup> relate this to the punitive medication error policies and processes of long-term care facilities in the USA, which they identified in an earlier study.<sup>15</sup>

Although the majority of the studies used the HSOPS or the NHSPSC (adapted version), and only one study used the SAQ,<sup>16</sup> in this study, we choose to use the SAQ. This choice is based on the review of survey instruments by Colla *et al*,<sup>5</sup> and because benchmark data for acute hospital care in the Netherlands is available for the SAQ, and not for the HSOPS (or the NHSPSC). Notably, these questionnaires measure a number of similar dimensions.<sup>5</sup> In one study in a US nursing home by Wisniewski *et al*,<sup>16</sup> the SAQ was also used. This study seems to suggest that the SAQ can successfully be adapted to the nursing home setting. However, this was a pilot study in one nursing home with only a small sample of employees (51) and a low response rate (18%).<sup>16</sup>

**Table 1** Scales, definitions, number of items and example items of the Safety Attitudes Questionnaire

Scale	Definition <sup>6</sup>	N items	Example items
Teamwork climate	Perceived quality of collaboration between personnel	6	Disagreements in this team are appropriately resolved (ie, not <i>who</i> is right, but <i>what</i> is best for the patient) In this team, it is difficult to speak up if I perceive a problem with patient care (revised item)
Job satisfaction	Positivity about the work experience	5	I am proud to work in this organisation Working in this organisation is like being part of a large family
Perception of management	Approval of managerial action	4	I am provided with adequate, timely information about events in this organisation that might affect my work The management of this organisation supports my daily efforts
Safety climate	Perceptions of a strong and proactive organisation's commitment to safety	7	I receive appropriate feedback about my performance I am encouraged by my colleagues to report any patient safety concerns I may have
Working conditions	Perceived quality of the work environment and logistical support (staffing, equipment, etc.)	4	This organisation does a good job of training new personnel All the necessary information for care-related decisions is routinely available to me
Stress recognition	Acknowledgement of how performance is influenced by stressors	4	When my workload becomes excessive, my performance is impaired I am more likely to make errors in tense or hostile situations

This study will, therefore, focus on two objectives. The first objective is to test if the SAQ is appropriate to measure the safety attitude of caregivers in nursing and residential homes, and second, to compare the safety attitude with available data on the safety attitude of caregivers in other settings (ie, inpatients, ICU and ambulatory care).

## METHODS

### Study design

In order to create a noteworthy dataset that includes different nursing and residential homes in The Netherlands, we chose a pragmatic approach. We sent recruitment emails to several nursing and residential homes to invite their participation in the research. Nine of them agreed to participate and chose to include one unit each. All employees (part of multiple teams) within that unit were included in the study. The nine participating nursing and residential homes are located across the country, and varied from a medium-size organisation with 2000 employees to large organisation with over 6000 employees.

Each unit consisted of different teams of nurse's aides, registered nurses and a geriatric specialist (doctor). Occupational, speech and physical therapist are mostly available on site. These teams provide medical assistance, emotional support, facilitate patients in their day-to-day affairs and engage them in social activities. Dutch long-term care is financed by national insurance, which makes the homes fully accessible. Caregivers in Dutch nursing and residential homes are mostly (79.7%) licensed practical or vocational nurses (a secondary vocational education). 17.5% of the caregivers are aides (high school educational level), and a small percentage (2.8%) are registered nurses (bachelor educational level).<sup>17</sup> In the USA, most caregivers in nursing and residential homes are aides (65.4%), and there are less licensed practical or vocational nurses (22.9%) in the USA in comparison with the Netherlands, but more registered nurses (11.7%).<sup>18</sup>

Employees who provide direct care to clients were invited to complete the SAQ. The participating units, teams and their members were identified by the Human Resources director and unit managers. The number of participating teams varied from 3 to 10 teams per unit. The size of teams varied from 2 to 50 team members. Employees providing technical and/or general services were excluded. The surveys were sent by mail with a letter from the researchers to introduce the aim of the research project. The respondents were requested to complete the questionnaire in 1 month.

### Measures

The SAQ assesses the measurable components of safety culture by measuring caregivers' attitudes and perceptions relevant to the safety of healthcare. The SAQ assesses the safety attitude by measuring six

scales (see table 1 for definitions of scales, number of items and example items). The SAQ is adjusted for different settings: ICU, operating room, ambulatory, pharmacy, labour and delivery. All versions contain 30 items that reflect the six scales and approximately 34 items that are not included in the scales (which slightly differs between the versions). A review by the three authors of this article and three caregivers in the long-term care showed that none of the available SAQ versions that are adjusted for different settings in healthcare were completely applicable for caregivers who work in teams in the nursing and residential homes setting. However, the ambulatory SAQ, which incorporates a section relating to long-term care,<sup>19</sup> could be adjusted to the nursing and residential homes setting with just minor changes in wording. First, the ambulatory SAQ was adjusted to the nursing and residential homes setting by changing, for example, the item 'in this office, it is difficult to discuss errors' into 'in this team, it is difficult to discuss errors'. Second, the adjusted ambulatory SAQ was translated into Dutch. Because the ICU SAQ and the ambulatory SAQ are similar, the validated Dutch translation of the ICU SAQ guided the translation of ambulatory SAQ into Dutch.<sup>20</sup> The required adjustments were reviewed by the original research team that translated and validated the SAQ for the Dutch ICU setting.<sup>20</sup>

Each item could be rated on a five-point Likert scale: strongly disagree (a score of 0), slightly disagree (25), neutral (50), slightly agree (75) and strongly agree (100). Each of the six scales was calculated as the mean score of its component items and consequently each scale could range from 0 to 100. The scores of the negatively formulated items were reversed, which means that higher scores referred to more positive safety attitude. The questionnaire also contained basic demographic data such as gender, education, profession, job status and team tenure.

### Analysis

All analyses were performed in the Statistical Package for the Social Sciences (SPSS) V.15.0, and the assumptions of the different analyses were met.

Analysis regarding the psychometric properties consisted of exploratory factor analysis and Cronbach's alpha values. The principal component analysis (PCA) (varimax rotation) was conducted with the following criteria: Kaiser–Meyer–Olkin measure of sampling adequacy (KMO) value exceeding 0.60, a significant value of the Bartlett's test of sphericity ( $p<0.05$ ), items loadings above 0.40. The reliability of the factors from the PCA was tested by Cronbach's alpha values, with 0.70 as minimum criterion. To explore the variance between units—teams and residential versus nursing care—analysis of variance (ANOVA) analyses were performed, and the intraclass correlations (ICC1) values were calculated. In order to

## Original research

benchmark data for nursing and residential homes with the data for inpatient care,<sup>6</sup> ICU<sup>6</sup> and ambulatory setting,<sup>19</sup> we compared the mean scores for the six SAQ scales using t test for independent samples (two-tailed).

## RESULTS

## Sample

**Table 2** lists the characteristics of our sample. In total, 521 caregivers, representing 53 teams, completed the questionnaire, which represents an overall response rate of 53%. The response rate per organisation varied from 40.2% to 81.4%. Respondents were for a greater part female (93.3%), which is representative for the caregiver population of nursing and residential homes in the Netherlands, of which, 90.5% are female. A big part of the respondents provided care in residential homes (76.8%). Most of the respondents fulfilled a part-time job, which is a good reflection of nursing and residential homes in the Netherlands, in which, 250.047 caregivers are employed for 163.261 full-time equivalents. Respondents included mostly licensed practical nurses (62.2%). The distribution in education in the sample is similar to the overall long-term care setting, in which, a small part of caregivers holds a bachelor's or master's degree, and the biggest group completed a secondary vocational education.<sup>21 22</sup> The respondents on average had worked more than 10 years in the current organisation

**Table 2** Characteristics of respondents

Characteristics	Number (%)
Gender: female	486 (93.3)
Type of care	
Residential care	400 (76.8)
Nursing care	121 (23.2)
Education	
High school	71 (13.6)
Secondary vocational education	401 (76.9)
Bachelor or master degree	45 (8.6)
Profession	
Licensed practical nurse	324 (62.2)
Registered nurse	75 (14.4)
Nurse assistant	81 (15.5)
Paramedical staff	13 (2.4)
Social worker	12 (2.3)
Doctor	2 (0.4)
Job status	
Full time	113 (21.7)
Part time	345 (66.2)
Other (on an agency or flexible contract basis)	56 (10.7)
Mean number of years in this team (SD)	5.11 (5.43)
Mean number of years in this organisation (SD)	10.09 (8.75)
Mean number of years in this discipline (SD)	9.25 (9.00)
Not all percentages add up to 100% due to missing values.	

(mean=10.09, SD=8.75), 9.25 years (SD=9.00) in this discipline and had been members of the current team for 5.11 years (SD=5.43).

## Psychometric results

The factor analyses and calculated Cronbach's alphas for this sample confirm the robustness of the SAQ scales, as shown in **table 3**. All SAQ dimensions showed one dimensional construct, and met the criteria (KMO, eigenvalue, explained variance, item loadings, Bartlett's test of sphericity; p<0.01). The Cronbach's alphas confirmed the reliability of the five-point scale by exceeding the criteria of 0.70, with the exception of the scale perception of management with a Cronbach's alpha of 0.56. However, this is in line with the modest Cronbach's alpha of 0.68 in the study of Modak *et al*,<sup>19</sup> and common for scales with a few items where a Cronbach's alpha of 0.50 is accepted.<sup>23</sup>

## Variance of SAQ dimensions

ANOVA analysis (**table 3**) showed that five SAQ dimensions differ significantly between the nine units and between teams: teamwork climate (p<0.01), job satisfaction (p<0.01), perception of management (p<0.01), safety climate (p<0.01) and work conditions (p<0.01). The nine units and teams did not significantly differ in terms of stress recognition (p>0.05). In order to further explore the importance of the unit or team level, we calculated the ICC1 values, which indicate the percentage of the variance (of an SAQ dimension) that could be assigned to a higher level (ie, unit or team level). The variance of SAQ dimensions that could be assigned to the unit level varied between 1% and 12%. Between 3.3% and 20.9% of the variance on SAQ dimensions could be attributed to the team level. **Table 3** also shows that teamwork climate (p<0.01), job satisfaction (p<0.05) and perception of management (p<0.05) significantly differ between nursing homes and residential homes.

## Benchmark

In **table 4**, the mean scores (and SDs) for the six SAQ dimensions are presented for nursing and residential homes as one setting and as two separate settings. These scores are compared with the benchmark settings: inpatient, ICU, ambulatory. Overall, the scores from the nursing and residential homes differ significantly from the benchmark settings. Because previous analysis pointed out that teamwork climate, job satisfaction and perception of management are rated differently for nursing homes as for residential homes, the division in settings will explicitly be mentioned for these three SAQ dimensions. Nursing homes score significantly higher on these three SAQ dimensions in comparison with residential homes.

The safety climate and working conditions in nursing and residential homes are significantly higher

**Table 3** Psychometric results, ANOVA and ICC values

Psychometric results				Item loadings	Unit level (n=9)		Team level (n=53)		Type of care (n=2)	
Dimensions SAQ	Cronbach's alpha	KMO	Eigenvalue		Explained variance (%)	p Value ANOVA	ICC 1 value	p Value ANOVA	ICC 1 value	p Value t test
Teamwork climate	0.73	0.82	2.72	45.27	0.48–0.74	0.00	0.06	0.00	0.15	0.01
Job satisfaction	0.80	0.80	2.87	57.40	0.53–0.87	0.00	0.10	0.00	0.19	0.04
Perception of management	0.56	0.66	1.74	43.48	0.46–0.73	0.00	0.10	0.00	0.21	0.05
Safety climate	0.76	0.84	2.88	41.20	0.56–0.71	0.00	0.08	0.00	0.11	0.77
Working conditions	0.75	0.76	2.27	56.80	0.71–0.80	0.00	0.12	0.00	0.20	0.25
Stress recognition	0.76	0.72	2.34	58.52	0.73–0.79	0.09	0.01	0.07	0.03	0.80

ANOVA; analysis of variance; ICC, intraclass correlations; KMO, Kaiser–Meyer–Olkin measure of sampling adequacy; SAQ, Safety Attitudes Questionnaire.

rated than in the inpatient setting, but significantly lower than in the ICU and ambulatory setting. Stress recognition appeared to be significantly lower in nursing and residential homes in comparison with the three (US) benchmarking scores. Respondents in residential homes perceive teamwork climate significantly higher than respondents in inpatient and lower than respondents in ambulatory settings, but do not significantly differ from the ICU setting. Teamwork climate in nursing homes is significantly higher than ICUs in the Netherlands (not ICUs in USA), but does differ from the other benchmark settings. In nursing and residential homes, the job satisfaction and the perception of the management are perceived significantly more positive in comparison with the inpatient and ICU setting, but do not significantly differ from the ambulatory setting. Job satisfaction in nursing homes (not in residential homes) is scored significantly higher than in ICUs in the Netherlands (not ICUs in USA).

### Additional analysis

Although studies that investigate and/or use the SAQ to measure patient safety commonly present psychometric analysis and a benchmark, the relationship among the SAQ dimensions is rarely studied. This relationship is presented in a correlation matrix in table 5. These results show that there is a high positive correlation between teamwork climate, job satisfaction, perception of management, safety climate and working conditions. Notable is the negative correlation between stress recognition and teamwork climate ( $r=-0.13$ ,  $p<0.01$ ), job satisfaction ( $r=-0.17$ ,  $p<0.01$ ), safety climate ( $r=-0.18$ ,  $p<0.01$ ) and working conditions ( $r=-0.18$ ,  $p<0.01$ ). The safety climate was positively correlated to team tenure ( $r=0.10$ ,  $p<0.05$ ), meaning that if caregivers work longer in the same team, the safety climate is higher. The negative correlation between safety climate and education ( $r=-0.12$ ,  $p<0.01$ ) indicates that the higher the education of professionals the lower the perception of the safety

**Table 4** Results of the SAQ nursing/residential care settings compared with benchmarking data

Dimensions SAQ	Mean scores (SD)			Benchmarking scores			
	Scores, nursing and residential setting			The Netherlands <sup>20</sup> USA <sup>6 20</sup>			
	Nursing/ residential care	Nursing care	Residential care	ICU	ICU	Inpatient	Ambulatory
Teamwork climate	70.1 (13.1)*	72.92 (14.04)†	69.19 (12.68)*	69.0 (12.1)	70.7 (18.6)	64.3 (16.6)	69.7 (17.0)
Job satisfaction	69.9 (14.6)†‡	72.35 (13.96)§‡	69.18 (14.75)‡	65.6 (13.9)	63.4 (21.6)	59.6 (20.5)	70.6 (20.2)
Perception of management	55.1 (15.5)‡	57.62 (16.95)‡	54.35 (14.92)‡	55.4 (12.7)	48.0 (20.3)	38.3 (18.7)	55.3 (21.9)
Safety climate	64.5 (12.4)§¶	64.22 (11.98)**	64.60 (12.52)§¶	69.4 (14.2)	67.7 (17.0)	60.5 (16.0)	69.9 (16.2)
Working conditions	56.1 (15.8)¶	57.57 (14.80)††	55.64 (16.14)**	54.4 (11.8)	58.6 (20.4)	49.2 (19.5)	61.6 (20.2)
Stress recognition	52.7 (18.9)¶	52.28 (19.09)**	52.77 (18.91)¶	52.2 (16.4)	65.9 (20.2)	74.4 (20.2)	66.7 (21.1)

\*Significantly different score from inpatient (USA) and ambulatory (USA) at  $p<0.01$ .

†Significantly different score from ICU (the Netherlands) at  $p<0.05$ .

‡Significantly different score from inpatient (USA) and ICU (USA) at  $p<0.01$ .

§Significantly different score from ICU (the Netherlands) at  $p<0.01$ .

¶Significantly different score from inpatient (USA), ICU (USA) and ambulatory (USA) at  $p<0.01$ .

\*\*Significantly different score from inpatient (USA), ICU (USA) and ambulatory (USA) at  $p<0.05$ .

††Significantly different score from inpatient (USA) at  $p<0.01$ .

ICU, intensive care unit; SAQ, Safety Attitudes Questionnaire.

## Original research

**Table 5** Correlations between Safety Attitudes Questionnaire dimensions and respondent characteristics

	1	2	3	4	5	6	7	8	9	10
1 Teamwork climate	1									
2 Job satisfaction	0.52*	1								
3 Perception of management	0.31*	0.49*	1							
4 Safety climate	0.60*	0.63*	0.45*	1						
5 Working conditions	0.41*	0.52*	0.61*	0.55*	1					
6 Stress recognition	-0.13*	-0.17*	-0.08	-0.18*	-0.18*	1				
7 Gender (0 male, 1 female)	0.01	0.04	0.02	0.07	-0.07	-0.05	1			
8 Education	0.01	-0.04	-0.03	-0.12*	-0.06	-0.05	-0.08	1		
9 Team tenure (months)	0.07	0.03	0.00	0.10†	0.04	-0.02	0.05	0.01	1	
10 Job status (1 full time, 2 part time)	0.12†	0.03	-0.02	0.15*	-0.02	-0.10†	0.18*	0.06	0.03	1
11 Number of team members	0.01	0.01	0.12†	0.05	0.12†	-0.04	-0.03	0.01	0.15*	0.02

\*Correlation significant at the 0.01 level (Pearson, two-tailed).

†Correlation significant at the 0.05 level (Pearson, two-tailed).

climate. The job status correlates positively with teamwork climate ( $r=0.12$ ,  $p<0.05$ ) and safety climate ( $r=0.15$ ,  $p<0.01$ ), and negatively with stress recognition ( $r=-0.10$ ,  $p<0.05$ ). These results indicate that part-time professionals perceive a better teamwork and safety climate, and recognise less stress moments. In addition, the smaller the team, the more positive the perception of the management ( $r=0.12$ ,  $p<0.05$ ) and a higher perception of the working conditions ( $r=0.12$ ,  $p<0.05$ ).

## DISCUSSION

### Key findings and implications

The findings in this study seem to confirm our expectation that the SAQ can also be used to measure safety culture in the nursing and residential home settings. Although none of the SAQ versions were completely applicable, only minor changes in wording of the SAQ for ambulatory care were required. These findings are in line with the preliminary conclusion of the pilot study executed by Wisniewski *et al.*<sup>16</sup> Our study underlines this conclusion with the results of factor analyses and the calculated Cronbach's alphas that confirmed the robustness of each SAQ dimension for this setting. Unfortunately, the study of Wisniewski *et al*<sup>16</sup> used different scale scores, and can, therefore, not be used for benchmarking.

In contrast to our expectations and different studies, we found that not all dimensions of the questionnaire are positively correlated for this setting. The overall score (by combining the six dimensions) of the SAQ seems, therefore, not reliable for the nursing and residential home settings. There is a high positive correlation between teamwork climate, job satisfaction, perceptions of management, safety climate and working conditions, but stress recognition has a small negative correlation with each of the other dimensions. Taylor and Pandian<sup>24</sup> found similar relationships in their analyses of SAQ data from US hospitals. They argue that stress recognition is a dissonant

subscale of the safety climate construct. Their analyses showed that 96% of the variance in this scale was unique, and not in common with the other SAQ scales.<sup>24</sup> They argue that the other subscales refer to the perspectives of respondents on their work areas or broader organisational units; stress recognition is about individual perspectives on abilities. They conclude that stress recognition should not be included in the overall safety attitude construct, which the SAQ intends to reflect.<sup>24</sup> The authors recommend looking at stress recognition as a stand-alone construct.<sup>24</sup> Our findings seem to support this recommendation.

The positive correlation between the other dimensions of the SAQ (stress recognition excluded) does provide some opportunities for practice. It indicates that interventions that aim to improve one dimension of the safety climate are likely to positively influence the other dimensions. Nursing and residential homes should, therefore, not feel obliged to invest in extensive programmes that focus on all safety dimensions at the same time. These programmes are expensive, time-intensive and perhaps partly redundant because an increase in one SAQ dimension (as a result of an intervention) will influence other dimensions, and make additional intervention within the programme excessive.

Dutch nursing and residential homes had comparable scores on safety climate, working conditions and stress recognition, but different scores on teamwork climate, job satisfaction and perception of management. Differences are probably explained by the fact that nursing homes focus more on multidisciplinary teamwork to care for a complex group of patients. However, the division between nursing and residential home is decreasing because care in residential homes is becoming more complex.<sup>8</sup> The scores from the Dutch nursing/residential care setting were benchmarked with SAQ scores of inpatient hospital units (USA), ICUs (USA and The Netherlands) and ambulatory care (USA). The benchmark shows that stress

recognition for this setting was significantly lower compared with the hospital units, ICUs (USA) and ambulatory care, but similar to the ICU in the Netherlands. Also, in contrast with the other SAQ dimensions, stress recognition between the nine units and teams within our study did not significantly differ. As discussed, stress recognition may be seen as a stand-alone construct with its own unique variance. Variables may influence stress recognition, which have no or a different effect on the (other) SAQ dimensions. Our data seem to suggest that there are differences between the US and Dutch settings that influence stress recognition. It may be that there is a cultural factor involved that makes Dutch workers respond differently to the stress recognition questions. It could also be that US workers are made more aware of the relationship between stress and safety or that the working conditions are more stressful in the USA, and workers have, therefore, more experience with the negative effects on safety. For most other scales, the scores of the Dutch nursing and residential homes were significantly higher than the scores of US inpatient hospital units. The reason may be that within teams and organisations in nursing/residential care, hierarchical differences are much smaller; there are fewer doctors and managers, and because of the larger focus on care (instead of cure), the role of other health professionals is much more prominent, which positively influences scores on 'teamwork climate', 'job satisfaction', 'perceptions of management' and 'working conditions'. On 'safety climate', the nursing/residential care scored lower than the ICU (USA and Dutch) and ambulatory care, but higher than the inpatient hospital unit. The former may be partly explained by the lower level of education of the nursing staff in the nursing/residential care, as our findings suggest that higher educated professionals are more critical about safety climate. This is in line with research that shows that a higher level of education of the nursing population, at a bachelor degree, results in more critical reflection, and therefore, positively influences mortality and complication rate.<sup>25</sup> Because safety climate scores are likely dependent on educational level, they may, therefore, be less comparable among healthcare settings that differ in average educational level. When comparing the Dutch SAQ scores (nursing and residential homes, ICU) to the US scores, the differences on stress recognition were already mentioned, but another striking difference is the score on perception of management. Especially, the US ICU and inpatient unit have a low score in this subscale compared with the Dutch scores. It may be that Dutch management is more involved in safety management or that US staff have higher expectations.

Our findings could be compared with three existing studies on patient safety in nursing homes. Two studies were conducted in US nursing homes, but used different surveys to determine PSC. Castle *et al*<sup>10</sup> used

the HSOPS, and found that nursing homes scored significantly lower on most dimensions of patient safety compared with inhospital departments, and concluded that nursing staff in US nursing homes 'generally agree that PSC is poor'. The HSOPS measures similar aspects of teamwork climate as the SAQ such as openness and feedback, working conditions, aspects of safety climate and management support (although the HSOPS did not measure job satisfaction). Wisniewski *et al*<sup>16</sup> did determine patient safety using the SAQ in a pilot study. They found that nursing staff was, in general, satisfied with their jobs, but scored relatively low on the perception on management and the safety climate.<sup>16</sup> We may conclude that the patient safety, overall, is lower evaluated in the US studies, compared with our study. One explanation may be related to the punitive medication error policies and processes of long-term care facilities in the USA as identified by Handler *et al*.<sup>14</sup> Most studies argue that 'an uneasiness with discussion and reporting of errors' in nursing homes in the USA is an important cause of the poor PSC.<sup>9–13</sup> This uneasiness and the related policies and processes may be a reaction of US nursing home management to the tremendous rising costs of litigation because of the increasing number and severity of lawsuits connected to patient safety in nursing homes.<sup>26</sup> Such a legal claim culture is absent in the Dutch healthcare system. The Dutch Health Inspectorate (a government agency) is primarily the organisation that governs patient safety issues for Dutch nursing homes. Although they do punish organisations for gross neglect, their primary focus is on prevention, monitoring, learning and improvement. This may be why the management approach to patient safety in nursing and residential homes in the Netherlands is more focused on openness and learning, and not on blaming and punishing, as can be seen from the results of the survey. It may also be that nurses in the USA score patient safety relatively low because they are more aware, and therefore, more critical of safety-related issues due to punitive measures to medical errors. However, this would not explain why Dutch nurses are much more positive about teamwork, openness and feedback. Another explanation may be related to differences in staffing and teamwork between Dutch nursing homes and US nursing homes. US nursing homes often do not employ doctors, and therapeutic expertise may not always be permanently available onsite. In contrast, each Dutch nursing home employs physical, occupational and speech therapists and also geriatric care specialists (physicians). They work together with registered nurses and nurse's aides as a multidisciplinary team. Residential care in the Netherlands used to resemble the nursing home model in the USA, but is starting to align to a greater extent with the Dutch nursing home model because of changes in financial reimbursement. It may be that a shared responsibility in a multidisciplinary team

## Original research

makes it safer and easier for caregivers to discuss and learn from errors.

### Limitations

This study has several limitations. Although our sample seems to represent a wide variety of nursing homes and residential homes in the Netherlands, based on size and location, it is still a convenience sample; so, there could be a selection bias. There may also be a selection bias because the homes were allowed to select which unit would participate. As only one unit was selected in each nursing and residential home, we could not analyse if the safety attitude scores were related to cultural characteristics of the unit or of the entire organisation. Furthermore, the performed benchmark is somewhat problematic; differences in work environment, level of education and safety issues make comparison difficult. Future research should, therefore, focus on comparing SAQ scores of nursing and residential homes over time, between countries and, if possible, investigate correlation with safety behaviour and safety outcomes. In addition, we do not know if there is a non-response bias as we were not able to conduct a non-response analysis. Because of these limitations, we need to be careful in drawing conclusions about the generalisability of our findings.

### CONCLUSION

In general, our results suggest that the SAQ can, with only minor changes in wording, be used to measure safety attitude in nursing and residential homes. We also expect it to be easily adaptable for other residential care facilities. However, our findings seem to support the suggestion that 'stress recognition' is not one of the dimensions of the safety attitude construct.

Dutch nursing and residential homes have significantly higher scores on most dimensions of the SAQ compared with inpatient units in US hospitals and mostly comparable scores with ICUs (Dutch and US) and ambulatory services. Dutch nursing and residential homes score significantly lower on stress recognition compared with US inpatient, ICU and ambulatory services, but comparable with Dutch ICUs.

**Contributors** Each author gave his/her final approval of the version to be published, and agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

**Competing interests** None declared.

**Provenance and peer review** Not commissioned; externally peer reviewed.

**Data sharing statement** The data are available to the first and third authors.

**Open Access** This is an Open Access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-

commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>

### REFERENCES

- Masotti P, McColl MA, Green M. Adverse events experienced by homecare patients: a scoping review of the literature. *Int J Qual Health Care* 2010;22:115–25.
- Tucker AL, Singer SJ. A Randomized Field Study of a Leadership WalkRoundsTM-Based Intervention. Harvard Business School Working Paper 2012;12.
- Rust TB, Wagner LM. Broadening the patient safety agenda to include safety in long-term care. *Healthc Q* 2008;11:31–4.
- Institute of Medicine: committee on Quality of Health Care in America. *Crossing the quality chasm: a new health system for the 21st century*. Washington DC: National Academies Press, 2001.
- Colla JB, Bracken AC, Kinney LM, et al. Measuring patient safety climate: a review of surveys. *Qual Saf Health Care* 2005;14:364–6.
- Sexton J, Helmreich R, Neilands T, et al. The safety attitudes questionnaire: psychometric properties, benchmarking data, and emerging research. *BMC Health Serv Res* 2006;6:44–54.
- European Commission. Long-term care in the European Union. Luxembourg: Office for Official Publications of the European Communities. 2008.
- Schäfer W, Kroneman M, Boerma W, et al. The Netherlands: health system review. *Health Syst Transit* 2010;12:v–xxvii, 1–228.
- Bonner AF, Castle NG, Perera S, et al. Patient safety culture: a review of the nursing home literature and recommendations for practice. *Ann Longterm Care* 2008;16:18–22.
- Castle NG, Sonon KE. A culture of patient safety in nursing homes. *Qual Saf Health Care* 2006;15:405–8.
- Castle NG, Wagner LM, Perera S, et al. Assessing resident safety culture in nursing homes: using the nursing home survey on resident safety. *J Patient Saf* 2010;6:59–67.
- Thomas KS, Hyer K, Castle NG, et al. Patient safety culture and the association with safe resident care in nursing homes. *Gerontologist* 2012;52:802–11.
- Scott-Cawiezell J, Vogelsmeier A. Nursing home safety: a review of the literature. *Annu Rev Nurs Res* 2006;24:179–215.
- Handler SM, Castle NG, Studenski SA, et al. Patient safety culture assessment in the nursing home. *Qual Saf Health Care* 2006;15:400–4.
- Handler SM, Nace DA, Studenski SA, et al. Medication error reporting in long term care. *Am J Geriatr Pharmacother* 2004;2:190–6.
- Wisniewski AM, Erdley WS, Singh R, et al. Assessment of safety attitudes in a skilled nursing facility. *Geriatr Nurs* 2007;28:126–36.
- van der Windt W, Talma H. *De arbeidsmarkt voor verpleegkundigen, verzorgenden en sociaal-pedagogen in de zorgsector 2004–2008*. Utrecht: Prismant, 2005.
- Harris-Kojetin L, Sengupta M, Park-Lee E, et al. *Long-term care services in the United States: 2013 overview*. Hyattsville, MD: National Center for Health Statistics, 2013.
- Modak I, Sexton JB, Lux TR, et al. Measuring safety culture in the ambulatory setting: the safety attitudes questionnaire—ambulatory version. *J Gen Intern Med* 2007;22:1–5.
- Poley MJ, van der Starre C, van den Bos A, et al. Patient safety culture in a Dutch pediatric surgical intensive care unit:

- an evaluation using the safety attitudes questionnaire. *Pediatr Crit Care Med* 2011;12:310–16.
- 21 AZW. *Arbeidsprognose van VOV-personeel in Zorg en Welzijn 2011–2015*. Zoetermeer: Panteia, 2010.
- 22 Raad van Volksgezondheid en Zorg. *Arbeidsmarkt en zorgvraag*. Den Haag: RVZ, 2006.
- 23 Field A. *Discovering statistics using SPSS*. London: Sage publications Ltd, 2013.
- 24 Taylor JA, Pandian R. A dissonant scale: stress recognition in the SAQ. *BMC Res Notes* 2013;6:302–8.
- 25 Aiken LH, Clarke SP, Cheung RB, et al. Educational levels of hospital nurses and surgical patient mortality. *JAMA* 2003;290:1617–23.
- 26 Stevenson DG, Studdert DM. The rise of nursing home litigation: findings from a national survey of attorneys. *Health Aff* 2003;22:219–29.

# Safety culture in long-term care: a cross-sectional analysis of the Safety Attitudes Questionnaire in nursing and residential homes in the Netherlands

Martina Buljac-Samardzic, Jeroen DH van Wijngaarden and Connie M Dekker-van Doorn

*BMJ Qual Saf* published online July 24, 2015

---

Updated information and services can be found at:  
<http://qualitysafety.bmj.com/content/early/2015/07/24/bmqs-2014-003397>

---

*These include:*

**References** This article cites 18 articles, 6 of which you can access for free at:  
<http://qualitysafety.bmj.com/content/early/2015/07/24/bmqs-2014-003397#BIBL>

**Open Access** This is an Open Access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>

**Email alerting service** Receive free email alerts when new articles cite this article. Sign up in the box at the top right corner of the online article.

---

**Topic Collections** Articles on similar topics can be found in the following collections  
[Open access \(251\)](#)

---

## Notes

---

To request permissions go to:  
<http://group.bmj.com/group/rights-licensing/permissions>

To order reprints go to:  
<http://journals.bmj.com/cgi/reprintform>

To subscribe to BMJ go to:  
<http://group.bmj.com/subscribe/>