

Exploring patient safety culture in preventive medicine settings: an experience from Northern Italy

C. TEREANU¹, G. SAMPIETRO², F. SARNATARO¹, G. MAZZOLENI³, B. PESENTI¹, L.C. SALA⁴, R. CECCHETTI⁵, M. ARVATI⁶, D. BRIOSCHI⁷, M. VISCARDI⁵, C. PRATI⁶, G. SALA⁸, G.G. BARBAGLIO⁹

¹ Department of Hygiene and Prevention, Agenzia di Tutela della Salute Bergamo, Italy; ² Epidemiology Service, Agenzia di Tutela della Salute Bergamo, Italy; ³ Azienda Socio-Sanitaria Territoriale, Bergamo Est, Italy; ⁴ Department of Prevention, Local Health Authority of Biella, Italy; ⁵ Department of Medical Prevention, Agenzia di Tutela della Salute Brianza, Italy; ⁶ Department of Medical Prevention, Agenzia di Tutela della Salute Val Padana, Italy; ⁷ Department of Teaching and Communication, Local Health Authority of Biella, Italy; ⁸ Research and Evaluation Officer, COOPI - Cooperazione Internazionale, Niamey, Niger; ⁹ MD, Medical Management, Agenzia di Tutela della Salute Bergamo, Italy

Keywords

Patient safety • Staff culture • Territorial preventive care • Italy

Summary

Introduction. Patient safety and quality in healthcare are inseparable. Examining patient safety culture in staff members contributes to further develop quality in healthcare. In Italy there has been some experience in assessing patient safety culture in staff working in hospital. In this pilot study we explored patient safety culture in public health staff working in Italian Local Health Authorities.

Methods. We carried out a descriptive cross sectional study in four Italian territorial Prevention facilities in Northern Italy. We administrated an adapted Italian version of the US Hospital Survey of Patient Safety Culture to all the staff within these facilities. The survey consisted of 10 dimensions based on 33 items, according to the results of a previous psychometric validation.

Results. Seventy per cent of the staff responded to the survey ($N = 479$). Overall, six out of the 10 dimensions exhibited composite scores of positive response frequency for patient safety culture below 50%. While “communication openness” (65%) was the most developed factor, “teamwork across Units” (37%) was the least developed. The work areas with the highest composite scores were Management and the Public Health Laboratory, while in terms of professional categories, Physicians had the highest scores. Patient safety culture in the staff participating in this study was lower than in hospital staff.

Discussion. Our descriptive cross sectional study is the first to be carried out in Preventive medicine settings in Italy. It has clearly indicated the need of improvement. Consequently, several interventions with this aim have been implemented.

Introduction

Patient safety, defined as “the prevention of harm caused by errors of commission and omission”, is a critical challenge of healthcare systems around the world [1]. Risk profile in healthcare settings depends on a lot of factors, of which users’ characteristics and organizational variables are the most important [2]. Users’ characteristics, such as age and current health condition, establish the access point to the healthcare system, but they cannot be largely influenced in order to increase patient safety [2]. For instance, objectively healthy people are served by preventive medicine facilities; community members with less serious conditions are in charge of primary care settings; people with serious acute conditions needing high diagnostic and therapeutic technologies make use of hospitals, while frail elderly people with chronic diseases and lower need of medical technologies are hosted in nursing homes. Conversely, organizational factors such as procedures, staff competence and skills, quality systems and organizational culture, which can be influ-

enced, should be systematically assessed and improved to continually increase patient safety.

Quality of care and patient safety should be guaranteed in all access points to the healthcare system of a country, independently of the intensity of care needed by their health condition. Examining staff attitudes with regard to patient safety (safety culture) in each type of healthcare setting may contribute to the better understanding of performance variations across them in terms of quality and safety.

Several international surveys showed that differences in patient safety culture exist between primary care, hospital and nursing home staff [3-5]. Surveys of patient safety culture that include territorial Preventive medicine staff are scarce and no disaggregated/specific data are available [6].

Across Italy, 154 regional public agencies called Local Health Authorities (LHAs) manage healthcare services for subsets of the regional population in defined geographical areas (the average population served is 390.000 inhabitants) [7]. Within the LHAs in Northern Italy, the Department of Medical Prevention works ac-

ording to regional prevention programs to provide sanitary education, healthy life style promotion, vaccinations, screenings, safety and hygiene services for food, the environment, the workplace etc., infectious disease surveillance and public health lab analyses [8-11]. Staff work in multidisciplinary teams of public health professionals and workers, including doctors (*e.g.* specialists in Public Health, Preventive medicine, Infectious diseases, Environmental epidemiology, Toxicology), sanitary assistants (*e.g.* assistant medical officers, public health nurses), technicians (*e.g.* environmental health officers or public health inspectors), clerks and others (*e.g.* psychologists, dietitians and nutritionists, engineers, public health lawyers, sociologists) [12].

The Department of Medical Prevention closely collaborates with the Department of Veterinary Prevention, according to the “one health” pattern, based on a socio-ecological system perspective, in which several distinct service providers contribute to public health in their catchment area in a coordinated manner, each overseeing a different branch. While in some Italian LHAs medical and veterinary preventive activities are provided by separate departments (*e.g.* Lombardy region), in others these activities are provided by the same department, *i.e.* the Department of Prevention (*e.g.* Piedmont region). The aim of this pilot study was to examine patient safety culture in Italian territorial Prevention facilities by investigating this in four different settings across Northern Italy. Assuming that patient safety culture in the staff members of an organization is a multidimensional concept, we applied the Agency for Healthcare Research and Quality (AHRQ) Hospital Survey on Patient Safety Culture (Hospital SOPS) [13], which was translated into Italian and adapted to our target settings, to find out which areas of patient safety were poor and needed improvement. We also examined differences across work areas and professional categories.

Methods

STUDY DESIGN AND SETTINGS

A descriptive cross-sectional study was carried out in four Italian territorial Prevention facilities: three Departments of Medical Prevention in the Lombardy region and one Department of Prevention in the Piedmont region. These settings voluntarily participated in an international project aimed at developing patient safety culture in Italian territorial Prevention facilities and Eastern European hospitals (*il progetto IRIDE: Italia - Romania - Repubblica Moldova in Rete: Imparando dagli errori verso una cultura della sicurezza dei pazienti/utenti*). They serve a population varying from about 200,000 to 1,100,000 inhabitants. Data were collected with an online form. The survey was administered from October 1st 2013 until the end of the month in two settings and between September 15th through to October 15th 2014 in the other two settings. Two reminders were sent in each setting before ending data collection, in order to increase the response rate.

PARTICIPANTS

The target population was represented by all Units and staff members in the target facilities.

Most Units existed in all four facilities at the time of the study (*e.g.* Hygiene and Public Health, Infectious Disease Prevention and Epidemiology, Community Preventive Medicine, Prevention and Safety in the Workplace, Plant engineering and Safety in the Workplace, Food & Nutrition Hygiene and Management). Some other Units (*e.g.* Public Health Laboratory, Environmental Medicine, Legal Medicine and Veterinary) did not exist in all facilities.

The main professional categories were represented by Technicians, followed by Physicians, Nurses/Sanitary assistants and Unit assistants/clerks/secretaries.

DATA SOURCES AND MEASUREMENT

Since its release in 2004, the AHRQ Hospital SOPS was translated in 31 languages and administered in 66 countries [14]. It showed acceptable psychometric properties in Europe [15-24], Asia and the Middle East [25-27]. It had been already translated into Italian (with the back translation method) [28] and applied in several Italian hospitals [28, 29, 30]. It was slightly adjusted for application in our settings and pre-tested on a small group of staff members from different professions. Psychometrics of the Italian version of the Hospital SOPS for territorial Prevention facilities were then explored. Among the 42 items of the 12-factor original US survey, only 33 items based on a 10-factor model showed acceptable psychometrics for application in our target facilities [31]. Moreover, the survey assessed two output indicators and required additional information on work area, staff position, and whether they have direct or indirect interaction with patients. The survey also allowed for open comments to be written at the end.

Items were measured using a 5-point Likert-type scale and were then aggregated into 10 composites (factors). Most safety culture composites used the scale of response option in terms of agreement (*Strongly agree to Strongly disagree*) and three composites in terms of frequency (*Always to Never*). Patient safety grade (output indicator) was measured with a five-point scale ranging from “*Excellent*” to “*Failing*”. Another output indicator was the number of reported adverse events in the last 12 months, assessed through five frequency categories. Participants were asked to respond to this item only if there had been an incident reporting system in their facility.

Anonymity was ensured throughout the study. To reduce respondents’ fear of being identified, several methods were adopted. Units with very low number of staff were aggregated to Units with higher number of staff, within the same work area. Moreover, a work area called “*Not otherwise specified*” was added to the seven work areas obtained, in order to be ticked by the respondents who did not want to indicate his/her true Unit. The same was done for the professional categories. The pre-test participants were informed that they would not be further invited to complete the survey. A thorough quality check was carried out on the surveys received. Forms with less

than one entire section completed, with less than half the questions answered, and straight-lining forms (where responses to all items in Sections A, B, C, D and F were the same) were excluded.

STUDY SIZE

Overall, 673 workers received the survey (staff census). After the quality check, the final dataset consisted of 479 respondents across four territorial prevention facilities.

STATISTICAL METHODS

Analyses were performed using STATA. The percentage of missing data was very low and therefore it was not necessary to address this issue. Frequency distributions were computed for the demographic characteristics of the respondents, for the two output indicators of the survey, as well as for the responses to each one of the 33 items of the survey. Negatively worded items were reverse coded before calculating the 10 composites scores. Patient safety culture was measured overall, by work area,

Tab. I. General characteristics of the respondents (I) and output indicators (II).

| Variable | | Frequency | % |
|---|---------------------------------|-----------|----|
| I. ACTUARIAL CHARACTERISTICS | | | |
| Your Work Area | A. Hygiene and Public Health | 169 | 35 |
| | B. Workplace Prevention | 130 | 27 |
| | C. Food & Nutrition Hygiene | 71 | 15 |
| | D. Public Health Laboratory | 25 | 5 |
| | E. Legal Medicine | 21 | 4 |
| | F. Veterinary Medicine | 11 | 2 |
| | G. Management | 26 | 5 |
| | H. Not otherwise specified | 26 | 5 |
| Work in the Department (years) | < 1 | 10 | 2 |
| | 1-5 | 59 | 12 |
| | 6-10 | 48 | 10 |
| | 11-15 | 83 | 17 |
| | 16-20 | 63 | 13 |
| | 21 or more | 216 | 45 |
| Work in the Unit (years) | < 1 | 15 | 3 |
| | 1-5 | 70 | 15 |
| | 6-10 | 67 | 14 |
| | 11-15 | 99 | 21 |
| | 16-20 | 73 | 15 |
| | 21 or more | 155 | 32 |
| Working hours in the Department per week | < 20 | 7 | 1 |
| | 20-38 | 355 | 74 |
| | 39-59 | 110 | 23 |
| | 60 or more | 7 | 1 |
| Staff position in the Department | Technician | 206 | 43 |
| | Physician | 84 | 18 |
| | Unit assistant/clerk/secretary | 82 | 17 |
| | Nurse/sanitary assistant | 74 | 15 |
| | Other (Chemist, Dietician, etc) | 33 | 7 |
| Direct interaction or contact with patients/users | Yes | 430 | 90 |
| | No | 48 | 10 |
| Experience in the profession (years) | < 1 | 7 | 1 |
| | 1-5 | 32 | 7 |
| | 6-10 | 44 | 9 |
| | 11-15 | 71 | 15 |
| | 16-20 | 65 | 14 |
| | 21 or more | 259 | 54 |
| II. OUTPUT INDICATORS | | | |
| Patient Safety Grade | Excellent | 47 | 10 |
| | Very Good | 184 | 39 |
| | Acceptable | 223 | 47 |
| | Poor | 17 | 4 |
| | Failing | 4 | 1 |
| Number of Events Reported | Non response | 173 | 36 |
| | None | 256 | 53 |
| | 1-2 | 36 | 8 |
| | 3-5 | 8 | 2 |
| | 6-10 | 3 | 1 |
| | 11-20 | 0 | 0 |
| 21 or more | 3 | 1 | |

Tab. II. Hospital SOPs adapted for Italian territorial Prevention facilities: response frequency and percentage of “positive” responses by survey item and composite, with 95% confidence intervals (CI).

| Composite and survey item (N = 479 respondents) | Number of total responses | % “Positive” response ¹ | 95%CI |
|---|---------------------------|------------------------------------|------------------|
| 1. Teamwork Within Units² | 1905 | 59.0 | 56.7-61.2 |
| A1. People support one another in this Unit. | 477 | 70.4 | 66.4-74.5 |
| A3. When a lot of work needs to be done quickly, we work together as a team to get the work done. | 477 | 56.6 | 52.2-61.1 |
| A4. In this Unit people treat each other with respect. | 477 | 56.2 | 51.7-60.6 |
| A11. When one area in this Unit gets really busy others help out. | 474 | 52.5 | 48.0-57.0 |
| 2. Supervisor/Head³ Expectations & Actions Promoting Patient/User Safety⁴ | 1425 | 58.6 | 56.0-61.2 |
| B1. My supervisor/manager says a good word when he/she sees a job done according to established patient/user ³ safety procedures. | 476 | 52.1 | 48.6-56.6 |
| B2. My supervisor/manager seriously considers staff suggestions for improving patient/user safety. | 474 | 55.5 | 51.0-60.0 |
| B4. My supervisor/manager overlooks patient/user safety problems that happen over and over. | 475 | 68.2 | 64.0-72.4 |
| 3. Organizational Learning – Continuous Improvement | 1429 | 50.9 | 48.3-53.5 |
| A6. We are actively doing things to improve patient/user safety. | 478 | 55.2 | 50.8-59.7 |
| A9. Mistakes have led to positive changes here. | 476 | 51.9 | 47.4-56.4 |
| A13. After we make changes to improve patient/user safety, we evaluate their effectiveness. | 475 | 45.5 | 41.0-50.0 |
| 4. Management Support for Patient/User Safety | 1421 | 43.8 | 41.3-46.4 |
| F1. <i>Department</i> management provides a work climate that promotes patient/user safety. | 478 | 48.5 | 44.1-53.0 |
| F8. The actions of <i>Department</i> management show that patient/user safety is a top priority. | 472 | 42.4 | 37.9-46.8 |
| F9r. <i>Department</i> management seems interested in patient/user safety only after an adverse event happens. | 471 | 40.6 | 36.1-45.0 |
| 5. Feedback & Communication About Error | 1417 | 42.8 | 40.3-45.4 |
| C1. We are given feedback about changes put into place based on event reports. | 471 | 34.4 | 30.1-38.7 |
| C3. We are informed about errors that happen in this Unit. | 474 | 41.4 | 36.9-45.8 |
| C5. In this Unit we discuss ways to prevent errors from happening again. | 472 | 52.8 | 48.3-57.3 |
| 6. Communication Openness | 1419 | 64.8 | 62.4-67.3 |
| C2. Staff will freely speak up if they see something that may negatively affect patient/user assistance. | 473 | 70.8 | 66.7-74.9 |
| C4. Staff feel free to question the decisions or actions of those with more authority. | 473 | 58.8 | 54.3-63.2 |
| C6r. Staff are afraid to ask questions when something does not seem right. | 473 | 64.9 | 60.60-69.21 |
| 7. Frequency of Events Reported | 1412 | 48.4 | 45.8-51.1 |
| D1. When a mistake is made, but is caught and corrected before affecting the patient/user, how often is this reported? | 471 | 54.4 | 49.9-58.9 |
| D2. When a mistake is made, but has no potential to harm the patient/user, how often is this reported? | 471 | 42.3 | 37.8-46.7 |
| D3. When a mistake is made that could harm the patient/users, but does not, how often is this reported? | 470 | 48.7 | 44.2-53.2 |
| 8. Teamwork Across Units | 1896 | 36.7 | 34.5-38.9 |
| F4. There is good cooperation among <i>Department</i> Units that need to work together. | 474 | 36.5 | 32.2-40.8 |
| F10. <i>Department</i> Units work well together to provide the best assistance for patients. | 472 | 39.4 | 35.0-43.8 |
| F2r. <i>Department</i> Units do not coordinate well with each other. | 478 | 25.9 | 22.0-29.9 |
| F6r. It is often unpleasant to work with staff from other <i>Department</i> Units. | 472 | 45.1 | 40.6-49.6 |
| 9. Handoffs & Transitions | 1881 | 35.8 | 33.7-38.0 |
| F3r. Things “fall between the cracks” when transferring patients/users from one Unit to another. | 470 | 34.0 | 29.8-38.3 |
| F5r. Important patient/user assistance information is often lost during <i>handovers for absence due to training/vacation</i> . | 468 | 42.7 | 38.3-47.2 |
| F7r. Problems often occur in the exchange of information across <i>Department</i> Units. | 470 | 23.2 | 19.4-27.0 |
| F11r. <i>Handovers for absence due to training/vacation</i> are problematic for patients/users in this Department. | 473 | 43.3 | 38.9-47.8 |
| 10. Non punitive Response to Errors | 1430 | 39.5 | 37.0-42.0 |
| A8r. Staff feel like their mistakes are held against them. | 478 | 42.3 | 37.8-46.7 |
| A12r. When an event is reported, it feels like the person is being written up, not the problem. | 477 | 38.0 | 33.6-42.3 |
| A16r. Staff worry that mistakes they make are kept in their personnel file. | 475 | 38.3 | 34.0-42.7 |
| Notes: | | | |
| ¹ According to the scale used for each item, “positive” response means “Agree”/“Strongly Agree” or “Most of the time”/“Always”. For negatively worded (r) questions, “positive” response means “Strongly Disagree”/“Disagree” or “Never”/“Rarely”. | | | |
| ² Composites are highlighted in Bold. | | | |
| ³ Our changes to the original version of the Hospital SOPs, necessary to make it compatible with the activity of the staff working in the study facilities, are highlighted in Italic. | | | |
| ⁴ The item “B3r. Whenever pressure builds up, my supervisor/manager wants us to work faster, even if it means taking shortcuts” was excluded during the psychometric validation process. | | | |

and by professional category. Overall composites were benchmarked with Italian and US hospitals and other outpatient settings from other countries [3, 4, 6, 28, 32]. In order to facilitate comparisons, 95% confidence intervals (CI) were computed.

Results

The response rate across the four territorial Prevention facilities varied from 67% to 73%, with an average of 71%. All items had good variability and the rates of missing responses ranged from 0% to 4% per item.

Table I shows respondents' demographics and response distribution concerning two output indicators.

Most respondents (35%) worked in the Hygiene and Public Health area, which was common to all four facilities, while the Veterinary Medicine area provided the least amount of respondents (2%), as it existed in one setting only. Half of the respondents experienced more than 21 years in the current profession (54%) and in the department (45%), but only a third of them (32%) in the current Unit, reflecting a job rotation process across the Units of the same department.

Most respondents (74%) usually worked between 20 to 38 hours a week. Almost half of the respondents were Prevention Technicians (43%). Ninety percent of the respondents worked in direct contact with patients/users. Half of the respondents (49%) appreciated the "Patient Safety Grade" indicator as "excellent or very good".

The most frequent response to the "Number of events reported in the last 12 months" indicator was "No event reports". Interestingly, 36% of the respondents did not answer it.

Table II shows the response frequency and the percentage of positive responses (with 95% CI) by survey item. Positive answers varied from 23% for the item "Problems often occur in the exchange of information across department Units", to 70% for the item "People support one another in this Unit". Composites scores varied from 36% for "handoffs and transitions" to 65% for "communication openness". Six out of 10 composites were poor (i.e. under the cut-off point of 50%). These were: "management support for patient/user safety", "feedback and communication about errors", "frequency of events reported", "non-punitive response to errors", "teamwork across Units", "handoffs and transitions".

Patient safety composites of positive responses (with 95% CI) by work area are shown in Table III and by professional group in Table IV. "Communication openness", "Teamwork within Units" and "Supervisor/head expectations and actions promoting patient/user safety" were sufficiently developed in all work areas and professional categories (scores >50%).

Compared to the overall results, significantly higher scores were found for all composites in the Management area (range: 64% for "Teamwork across Units" - 86% for "Communication openness") and for six composites in the Public Health Laboratory area. The poorest findings were in the Workplace Prevention area (range: 26% for

Tab. III. The AHRQ Hospital SOPS adapted for Italian territorial Prevention facilities: % of positive responses by composite and work area, with 95% confidence interval (CI).

| Composite | % of positive responses with 95% CI | | | | | | | |
|---|--|----------------------|--------------------------|---------------------|--------------------------|---------------------|---------------------|---------------------|
| | Hygiene and Public Health ¹ | Workplace Prevention | Food & Nutrition Hygiene | Management | Public Health Laboratory | Legal Medicine | Other ² | Overall |
| 1. Teamwork Within Units | 62.1 (58.6-66.0) | 51.7 (47.4-56.1) | 52.1 (46.3-57.9) | 70.2 (61.4-79.0) | 69.9 (59.6-77.8) | 68.7 (58.7-78.6) | 62.2 (54.4-70.0) | 59.0 (56.7-61.2) |
| 2. Supervisor/Head Expectations & Actions Promoting Patient/User Safety | 60.1 (55.8-64.5) | 50.5 (45.5-55.5) | 50.5 (43.7-57.2) | 84.4 (76.3-92.5) | 73.3 (63.3-83.3) | 66.7 (55.0-78.3) | 60.7 (50.3-71.2) | 56.6 (56.0-61.2) |
| 3. Organizational Learning-Continuous Improvement | 51.30 (47.2-56.0) | 44.7 (39.8-49.7) | 42.2 (35.5-48.8) | 69.2 (59.0-79.5) | 70.5 (58.9-79.8) | 52.4 (40.1-64.7) | 59.5 (50.3-68.6) | 50.9 (48.3-53.5) |
| 4. Management Support for Patient/User Safety | 42.2 (38.0-46.7) | 36.8 (33.9-41.6) | 39.0 (32.4-45.5) | 79.5 (70.5-88.5) | 39.0 (26.8-48.9) | 50.8 (38.5-63.1) | 59.6 (50.4-68.8) | 43.8 (41.3-46.4) |
| 5. Feedback & Communication About Error | 40.6 (36.7-45.3) | 33.3 (28.5-38.0) | 39.0 (32.4-45.5) | 70.1 (59.9-80.4) | 70.5 (58.9-79.8) | 50.8 (38.5-63.1) | 50.5 (41.0-59.9) | 42.8 (40.3-45.4) |
| 6. Communication Openness | 62.1 (58.1-66.6) | 62.2 (57.3-67.1) | 63.5 (57.0-70.0) | 85.7 (77.9-93.5) | 82.1 (72.5-90.2) | 57.1 (44.9-69.4) | 66.4 (57.5-75.2) | 64.8 (62.4-67.3) |
| 7. Frequency of Events Reported | 49.9 (45.8-54.6) | 33.6 (28.8-38.4) | 51.7 (44.9-58.5) | 79.5 (70.5-88.5) | 75.6 (64.8-84.5) | 44.4 (32.2-56.7) | 47.7 (38.3-57.1) | 48.4 (45.8-51.1) |
| 8. Teamwork Across Units | 37.8 (34.5-41.9) | 29.8 (25.8-33.8) | 27.8 (22.5-33.0) | 64.4 (55.2-73.6) | 44.3 (32.3-51.7) | 32.1 (22.2-42.1) | 50.4 (42.3-58.4) | 36.7 (34.5-38.9) |
| 9. Handoffs & Transitions | 37.7 (34.4-41.7) | 26.1 (22.3-30.0) | 31.4 (26.0-36.9) | 70.2 (61.4-79.0) | 36.9 (25.0-43.7) | 24.1 (14.9-33.3) | 50.4 (42.3-58.4) | 35.8 (33.7-38.0) |
| 10. Non-punitive Response to Errors | 37.6 (33.5-42.0) | 33.4 (28.7-38.1) | 36.5 (30.0-43.0) | 65.4 (54.8-75.9) | 62.8 (51.7-73.6) | 17.5 (8.1-26.8) | 53.2 (43.9-62.4) | 39.5 (37.0-42.0) |

¹ The work areas in Italic are common to all 4 territorial Prevention facilities participating in the study

² This category includes "veterinary medicine" and "not otherwise specified" work areas

Tab. IV. The AHRQ Hospital SOPS adapted for Italian territorial Prevention facilities: % of positive responses by composite and professional category, with 95% confidence interval (CI).

| Composite | % of positive responses with 95% CI | | | | | |
|---|-------------------------------------|---------------------------------|---------------------|---|---------------------|---------------------|
| | Physician | Nurse/ sanitary assistant | Technician | Unit assistant/ clerk/ secretary | Other | Overall |
| 1. Teamwork Within Units | 68.0 (63.0-73.0) | 62.1 (56.6-67.7) | 53.2 (49.8-56.6) | 55.3 (49.8-60.7) | 74.2 (66.8-81.7) | 59.0 (56.7-61.2) |
| 2. Supervisor/Head Expectations & Actions Promoting Patient/User Safety | 68.4 (62.6-74.2) | 57.3 (50.7-63.8) | 53.3 (49.4-57.3) | 57.1 (50.9-63.3) | 73.5 (64.7-82.2) | 58.6 (56.0-61.2) |
| 3. Organizational Learning-Continuous Improvement | 57.1 (51.0-63.3) | 51.6 (45.0-58.2) | 46.7 (42.8-50.7) | 46.9 (40.6-53.2) | 68.7 (59.6-77.8) | 50.9 (48.3-53.5) |
| 4. Management Support for Patient/User Safety | 50.4 (44.2-56.6) | 33.3 (27.1-39.6) | 39.2 (35.4-43.1) | 46.3 (40.0-52.6) | 73.5 (64.7-82.2) | 43.8 (41.3-46.4) |
| 5. Feedback & Communication About Error | 55.7 (49.5-61.8) | 38.3 (31.8-44.7) | 35.9 (32.1-39.7) | 42.1 (35.8-48.3) | 65.7 (56.3-75.1) | 42.8 (40.3-45.4) |
| 6. Communication Openness | 80.1 (75.1-85.0) | 58.5 (52.0-65.1) | 62.4 (58.6-66.3) | 57.5 (51.3-63.8) | 72.7 (64.0-81.5) | 64.8 (62.4-67.3) |
| 7. Frequency of Events Reported | 63.6 (57.6-69.6) | 56.3 (49.8-62.8) | 40.0 (36.1-43.9) | 42.2 (35.9-48.5) | 59.6 (49.9-69.3) | 48.4 (45.8-51.1) |
| 8. Teamwork Across Units | 46.6 (41.2-51.9) | 31.0 (25.7-36.2) | 30.7 (27.5-33.9) | 39.3 (34.0-44.7) | 55.3 (46.8-63.8) | 36.7 (34.5-38.9) |
| 9. Handoffs & Transitions | 41.8 (36.5-47.1) | 41.5 (35.9-47.1) | 29.6 (26.5-32.8) | 33.2 (28.1-38.4) | 52.3 (43.7-60.9) | 35.8 (33.7-38.0) |
| 10. Non-punitive Response to Errors | 50.4 (44.2-56.6) | 38.0 (31.6-44.4) | 36.7 (32.9-40.5) | 30.6 (24.8-36.4) | 54.6 (44.7-64.4) | 39.5 (37.0-42.0) |

Tab. V. The AHRQ Hospital SOPS adapted for Italian territorial Prevention facilities: an international comparison of % of positive responses (3, 4, 6, 28, 32).

| Composite | % of positive responses | | | | | |
|--|--|---------------------|------------------|-------------------------------|---------------------------------|-----------------------------------|
| | Territorial Prevention facilities (Italy) | Hospital (Italy) | Hospital (US) | Health district (Spain) | Primary healthcare (Iran) | Primary healthcare (Turkey) |
| 1. Teamwork Within Units | 59 | 64 | 81 | 81 | 74 | 76 |
| 2. Supervisor/Head Expectations & Actions Promoting Patient/User Safety ¹ | 59 | 69 | 76 | 81 | 68 | 58 |
| 3. Organizational Learning-Continuous Improvement | 51 | 74 | 73 | 72 | 72 | 47 |
| 4. Management Support for Patient/User Safety | 44 | 28 | 72 | 57 | 75 | 43 |
| 5. Feedback & Communication About Error | 43 | 60 | 67 | 60 | 44 | 50 |
| 6. Communication Openness | 65 | 62 | 62 | 63 | 62 | 46 |
| 7. Frequency of Events Reported | 48 | 59 | 66 | 49 | 50 | 12 |
| 8. Teamwork Across Units | 37 | 30 | 61 | 62 | 77 | 58 |
| 9. Handoffs & Transitions | 36 | 37 | 47 | 65 | - | 44 |
| 10. Non-punitive Response to Errors | 40 | 35 | 44 | 42 | 17 | 18 |

¹In the Italian version of the Hospital SOPS for territorial Prevention facilities this composite has only three of the four items of the original US version.

“Handoffs and transitions” - 62% for “Communication openness”), which exhibited significantly lower scores for six out of ten composites.

The Physician group exhibited significantly higher scores than the overall figure for six out of ten composites. Their composites ranged from 42% for “Handoffs and transitions” to 80% for “Communication openness”. On the contrary, the Technician group showed the poorest results (range: 30% for “Handoffs and transitions”

- 62% for “Communication openness”), with significantly lower composites than the overall figure for five composites. Significantly higher scores were found for staff belonging to other professional categories (e.g. engineers, dieticians, etc), ranging from 52% for “Handoffs and transitions” to 74% for “Teamwork within Units”. However, they represented only 7% of the total number of respondents, so these results should be interpreted with caution.

Table V shows an international benchmark of composite scores. [3, 4, 6, 28, 32]. The Italian experience pointed out that patient safety culture in Prevention facilities is less developed than in hospitals. While “*Teamwork within Units*” and “*Supervisor/head expectations & actions promoting patient/user safety*” (range: 59%-81%) are the most developed safety culture aspects across the compared facilities, “*Non-punitive response to errors*” remain problematic in all settings (range: 17%-44%).

Discussion

This study represents the first examination of patient safety culture within the staff of territorial Prevention facilities within the Local Health Authorities of Northern Italy. Four facilities were included in the study. Since there was not a specific survey available to be used in these settings, after searching existing scientific literature, we selected the Hospital version of the AHRQ SOPS. Besides being one of the most popular surveys currently used at international level [15-27] and being already available in Italian [28], this survey explores most of the aspects of patient safety culture which we were interested in. Moreover, several research groups around the world found the AHRQ Hospital survey useful to explore patient safety culture in non-hospital settings [3-6]. Thus, the original survey was slightly adjusted for use in our facilities and pre-tested on a few staff members. The psychometrics were checked thereafter. Results of the psychometric validation pointed out that 10 factors and 33 items of the original US survey (based on 12 factors with 42 items) were satisfactory for use in our facilities [31].

The Italian experience indicates that patient safety culture is less developed in territorial Prevention facilities than in hospitals [28-30]. Interestingly, the latter showed composites lower than US hospitals [32]. Our results are consistent with results from other studies carried out in facilities for outpatients, such as primary healthcare services, characterised by a lower potential of life-threatening medical errors and procedures [3, 4, 6]. Nonetheless, it raises serious concern from a public health point of view, as prevention facilities deal with entire communities and/or sub-groups of the population and most of the individuals interacting with our territorial Prevention facilities are objectively healthy.

Overall, “*Communication openness*”, “*Teamwork within Units*” and “*Supervisor/head expectations and actions promoting patient/user safety*” were the most developed aspects of the culture. Staff help each other, supervisors promote user safety and communication barriers between them are minimal, which suggests that some important basis for further developing user safety already exists. Conversely, “*Teamwork across Units*”, “*Handoffs and transitions*” as well as “*Non-punitive response to errors*” are the least developed aspects of the culture, requiring prompt intervention. Many other studies have pointed out the same strengths and weakness of patient safety culture [3-6, 29].

Voluntary error reporting is a critical mechanism for identifying patient safety issues and improving quality in an organization [33]. Patients’ safety culture enables providers to report mistakes and near misses [33]. In our facilities, a low frequency of events reported suggests the persistence of blame culture and under-reporting of incidents, as pointed out by other Italian studies [33, 34]. Respondents in the study only had to respond to the question about incident reporting if an incident reporting system was in place in their facility. The high proportion of non-response (36%) suggested that several staff members were not aware of the existence of the incident reporting system, which had been in place for several years. This is likely to be another cause of the under-reporting of incidents in the settings participating in the study.

We found a great variability of the positive responses among work areas and the profession of the respondents. The highest composites were exhibited by the Management area. Since it is the first recipient of the institutional strategic safety policies and has to account for their implementation into practice at each Unit level, we could consider this area highly auto-referential. Similar results have been observed in other studies [4, 32]. Our results also pointed out higher scores in the Laboratory of Public Health. This suggests that a strong leadership for quality, thorough external certification and accreditation processes, along with continuous internal auto-control, are important contributors to the development of good patient safety culture within staff. Physicians working in territorial Prevention facilities showed higher composite scores of positive responses for patient safety than other professionals (nurses, technicians, clerks). A recent study carried out by Nguyen *et al.* [35] in two Italian hospitals supports our findings, showing that professional profile contributed significantly to differences in safety attitudes and teamwork climate, which were more developed in physicians than in nurses.

Our study has several limitations. Firstly, all our facilities consisted of Units and healthcare professions that are quite different from those existing in hospitals, for which the survey we used was originally elaborated. For instance, physicians and nurses represented only one third of all the staff surveyed. Secondly, the study was not based on a random sample with a selection in numerous Italian regions, but only on four voluntary facilities, located in two northern regions. Thirdly, the organisational heterogeneity of the four facilities included in the study could also have introduced some bias. In fact, contrarily to the three Departments of Medical Prevention in the Lombardy Region, the Department of Prevention in the Piedmont Region covers a small territory and population, has closer collaboration with the hospitals in its activities, and runs not only human but also veterinary preventive activities to preserve public health. It also has a larger proportion of staff members with shorter experience in the department/Unit/profession and with more than 38 working hours a week. These distinct characteristics contributed to different awareness levels about risk of error/adverse events with respect to the other departments (which were

more homogeneous), leading to the better development of some dimensions of patient safety culture.

Finally, some Units were so small that despite our effort to preserve anonymity, opportunistic staff attitudes due to fear of being identified were still possible.

For these reasons our results are not representative for all the facilities similar to ours in Italy and further application of the survey in other territorial Prevention facilities would be necessary to confirm our results. Although it might seem appealing, international comparisons of results are to be considered very cautiously.

The study has some important strengths as well. Firstly, we psychometrically validated the survey that we applied to measure patient safety culture [31]. Secondly, the overall response rate (71%) was satisfactory. Thirdly, we described patient safety culture through a multidimensional tool in territorial Prevention facilities for the first time in our country. Finally, based on the results of this study, several actions for improvement were set up: a) courses on risk management have been organized for all work areas and professions, with priority given to the areas with the poorest results; b) thorough revision of the existing incident reporting system, including major advertising and ensuring wide-spreading accessibility and feedback; c) application of pro-active risk management tools such as Failure Mode and Effect Analysis to some key processes; d) intense exchange of information regarding best practices among the four departments participating in the study. Thus, the results of this study constitute not only an opportunity to explore and understand staff perception of user safety in the Prevention field, they can also be used as a baseline for improvement interventions and future assessments of the efficacy of specific targeted interventions.

Conclusions

A voluntary and anonymous qualitative cross-sectional study was carried out for the first time in Italian territorial Prevention facilities using a psychometrically validated version of the US Hospital Survey of Patient Safety Culture. “Communication openness”, “Teamwork within Units”, “Supervisor/head expectations and actions promoting patient/user safety” and “Organizational learning-continuous improvement” were the most developed factors of patient safety culture, while the other six factors evaluated were quite poor. Management scored highest across work areas, and Physicians scored highest across professional categories. However, overall results were poorer than in Italian hospitals. To confirm the results of this pilot study, the survey should be further expanded to other Italian territorial Prevention facilities; post-intervention application in the same facilities could help monitor efficacy of improvement actions. In this study, intra-country comparisons provided some interesting information, which could be useful to prevent auto-referentiality. Inter-country comparisons might be influenced by cultural and geographical differences and therefore they should be considered with caution.

Acknowledgments

The authors thank the Management of the Local Health Authorities participating in the study and all the health-care workers who completed the survey. They also thank A. Bagnasco for providing them with the Italian version of the Hospital SOPS. The authors are finally grateful to the Latin Association for Analysis of Healthcare Systems (ALASS) for the patronage of the IRIS project (*il progetto IRIDE*).

The authors declare no conflict of interest.

Authors' contributions

CT, BP, LCS, RC, MA, GGB decided the study design and organised the study. CT, GM, FS prepared the Web version of the survey. CT, MV, CP, DB were responsible for the data collection. GS carried out statistical analyses. CT and GS drafted the paper. All authors contributed to the interpretation of the results of the study and revised the paper. GS also checked the English.

References

- [1] Institute of Medicine (IOM). *Patient Safety: Achieving a New Standard for Care*. Washington, DC: National Academy Press, 2004.
- [2] Cosmi L, Del Vecchio M. *Lo scenario per lo sviluppo del risk management nella sanità*. In: Del Vecchio M, Cosmi L, editors. *Il risk management nelle aziende sanitarie*. Milano: McGraw-Hill 2003.
- [3] Bodur S, Feliz E. *A survey on patient safety culture in primary healthcare services in Turkey*. Int J for Qual in Health Care 2009;21(5):348-55.
- [4] Tabrizchi N, Sedaghat M. *The first study of patient safety culture in Iranian primary health center*. Acta Med Iran 2012;50(7):505-10.
- [5] Castle NC, Sonon KE. *A culture of patient safety in nursing homes*. Qual Saf Health Care 2006;15:405-8.
- [6] Pozo Muñoz F, Padilla Marín V. *Assessment of the patient-safety culture in a healthcare district*. Rev Calid Asist 2013; pii: S1134-282X(13)00051-1. doi: 10.1016/j.cali.2013.03.009.
- [7] Longo F, Salvatore D, Tasselli S. *The growth and composition of primary and community-based care services. Metrics and evidence from the Italian National Health Service*. BMC Health Services Research 2012, 12:393
- [8] Rosso A, Marzuillo C, Massimi A, De Vito C, De Belvis AG, La Torre G, Federici A, Ricciardi W, Villari P. *Policy and planning of prevention in Italy: results from an appraisal of prevention plans developed by Regions for the period 2010-2012*. Health Policy 2015;119:760-9.
- [9] Panunzio M, Caporizzi R, Cela E, Antoniciello A, Alonzo E, Bonaccorsi G, Chioffi L, Guberti E, Cairella G, Giostra G, Pontieri V, Prato R, Germinario C, Lagravinese D, Francia F, Cinquetti S, Triassi M, Conversano M, Carella F, Carreri V. *The nutrition hygiene as a mission of the Departments of Prevention*. Ann Ig 2016;28:173-8 doi:10.7416/ai.2016.2095.
- [10] Faggioli A. *The contribution of health professionals in the integration of health and environmental protection*. Ig Sanita Pubbl 2015;71(5):515-25.
- [11] Signorelli C, Riccò M, Odone A. *The Italian National Health Service expenditure on workplace prevention and safety (2006-2013): a national-level analysis*. Ann Ig 2016;28:313-8 doi:10.7416/ai.2016.2111.

- [12] La Torre G, Mete R, Giraldi G, Mannocci A, Saulle R, Maurici M, Capozzi C, Damiani G, Specchia ML, Capizzi S, Panà A, Boccia A, Ricciardi W. *Survey to assess educational needs of personnel working at Departments of Prevention, Health Districts and Hospital Directions in Italy: questionnaire validation and preliminary results*. *Ig Sanita Pubbl* 2015;71(4):387-403.
- [13] Sorra JS, Nieva VF. *Pilot study: Reliability and validity of the Hospital Survey on Patient Safety*. In Technical report prepared by Westat under Contract No. 290-96-004 Rockville, MD: Agency for Healthcare Research and Quality, 2004.
- [14] AHRQ. Agency for Healthcare Research and Quality. *International use of the surveys on patients safety culture*. Available at: <http://www.ahrq.gov/professionals/quality-patient-safety/patientsafetyculture/pscontusers.html>; Accessed on 14/02/2016.
- [15] Haugen AS, Sjøfteland E, Eide GE, Nortvedt MW, Aase K, Harthug S. *Patient safety in surgical environments: Cross-countries comparison of psychometric properties and results of the Norwegian version of the Hospital Survey on Patient Safety*. *BMC Health Serv* 2010;10:279.
- [16] Hedsköld M, Pukk-Härenstam K, Berg E, Lindh M, Soop M, Øvretveit J, Sachs MA. *Psychometric properties of the Hospital Survey on Patient Safety Culture, HSOPC, applied on a large Swedish health care sample*. *BMC Health Serv* 2013;13:332 doi:10.1186/1472-6963-13-332.
- [17] Smits M, Christiaans-Dingelhoff I, Wagner C, Wal GV, Groenewegen PP. *The psychometric properties of the "Hospital Survey on Patient Safety Culture" in Dutch hospitals*. *BMC Health Serv Res* 2008;8:230.
- [18] Pfeiffer Y, Manser T. *Development of the German version of the Hospital Survey on Patient Safety Culture: dimensionality and psychometric properties*. *Saf Sci* 2010;48:1452-62.
- [19] Occelli P, Quenon JL, Kret M, Domecq S, Delaperche F, Claverie O, Castets-Fontaine B, Amalberti R, Auroy Y, Parneix P, Michel P. *Validation of the French version of the Hospital Survey on Patient Safety Culture questionnaire*. *Int J Qual Health Care*. doi: 10.1093/intqhc/mzt047. Epub 2013 July 5.
- [20] Eiras M, Escoval A, Grillo IM, Silva-Fortes C. *The Hospital Survey on Patient Safety Culture in Portuguese hospitals: instrument validity and reliability*. *Int J Health Care Qual Assur* 2014;27(2):111-22.
- [21] Robida A. *Hospital Survey on Patient Safety Culture in Slovenia: a psychometric evaluation*. *Int J Qual Health Care* 2013;25(4):469-75.
- [22] Brborović H, Šklebar I, Brborović O, Brumen V. *Development of a Croatian version of the US Hospital Survey on Patient Safety Culture questionnaire: dimensionality and psychometric properties*. *Postgrad Med J* 2014;90:125-32.
- [23] Sarac C, Flin R, Mearns K, Jackson J. *Hospital Survey on Patient Safety Culture: psychometric analysis on a Scottish sample*. *BMJ Qual Saf* 2011;20(10):842-8.
- [24] Waterson P, Griffiths P, Stride C, Murphy J, Hignett S. *Psychometric properties of the Hospital Survey on Patient Safety Culture: findings from the UK*. *Qual Saf Health Care* 2010;19(5):e2.
- [25] Ito S, Seto K, Kigawa M, Fujita S, Hasegawa T, Hasegawa T. *Development and applicability of Hospital Survey on Patient Safety Culture (HSOPS) in Japan*. *BMC Health Serv Res* 2011;11:28. doi:10.1186/1472-6963-11-28.
- [26] Najjar S, Hamdan M, Baillien E, Vleugels A, Euwema M, Sermeus W, Bruyneel L, Vanhaecht K. *The Arabic version of the Hospital Survey on Patient Safety Culture: psychometric evaluation in a Palestinian sample*. *BMC Health Serv Res* 2013;13:193. doi: 10.1186/1472-6963-13-193.
- [27] Moghri J, Arab M, Saari AA, Nateqi E, Forooshani AR, Ghiasvand H, Sohrabi R, Goudarzi R. *The psychometric properties of the Farsi version of "Hospital Survey on Patient Safety Culture" in Iran's hospitals*. *Iranian J Publ Health* 2012;41(4):80-6.
- [28] Bagnasco A, Tibaldi L, Chirone P, Chiaranda C, Panzone MS, Tangolo D, Aleo G, Lazzarino L, Sasso L. *Patient safety culture: an Italian experience*. *J Clin Nurs* 2013;20:1188-95. doi: 10.1111/j.1365-2702.2010.03377.
- [29] Bagnasco A, Vignolo G, D'Addeo A, Grugnetti A, Calza S, Maricchio R, Sasso L. *La cultura della sicurezza del paziente: un'indagine nell'area oncologica*. *L'Infermiere*. 2013 N°2. Available at: <http://www.ipasivi.it/ecm/rivista-linfermiere/rivista-linfermiere-page-14-articolo-169.htm>; 2015. Accessed 15/03/2015.
- [30] Azienda ULSS 20 Verona Comitato Esecutivo Aziendale per la Sicurezza del paziente. *Piano Annuale per la Sicurezza del Paziente* 2013, pp 90-5 Available at: http://dmo.ulss20.verona.it/c/document_library/get_file?uuid=f74fe553-29f4-4a18-87aba1ce55ede59c&groupId=16917; Accessed on 15/03/2015.
- [31] Tereanu C, Smith SA, Sampietro G, Sarnataro F, Mazzoleni G, Pesenti B, Sala LC, Cecchetti R, Arvati M, Brioschi D, Viscardi M, Prati C and Barboglio GG. *Experimenting the hospital survey on patient safety culture in prevention facilities in Italy: psychometric properties*. *Int J Qual Health Care* 2017;29(2):269-75 doi: 10.1093/intqhc/mzx014.
- [32] Agency for Healthcare Research and Quality. *User Comparative Database Report*. March 2014. Rockville, MD. Available at: <http://www.ahrq.gov/professionals/quality-patient-safety/patientsafetyculture/hospital/2014/index.html>; Accessed on 15/03/2015.
- [33] Richter JP, McAlearney AS, Pennell ML. *Evaluating the effect of safety culture on error reporting: a comparison of managerial and staff perspectives*. *Am J Med Qual* 2015;30(6):550-8pii: 1062860614544469.
- [34] Bodina A, Demarchi A, Castaldi S. *A web-based incident reporting system: a two years' experience in an Italian research and teaching hospital*. *Ann Ig* 2014;26(3):219-25. doi: 10.7416/ai.2014.1980.
- [35] Nguyen G, Gambashidze N, Ilyas SA, Pascu D. *Validation of the safety attitudes questionnaire (short form 2006) in Italian in hospitals in the northeast of Italy*. *BMC Health Serv Res* 2015;15:284. doi: 10.1186/s12913-015-0951-8.

■ Received on April 13, 2016. Accepted on February 14, 2017.

■ Correspondence: Carmen Tereanu, Department of Hygiene and Prevention, Agenzia di Tutela della Salute Bergamo, via Borgo Palazzo 130, 24125 Bergamo, Italy - E-mail: carmen.tereanu@ats-bg.it