Perception of patient safety culture in Slovenian acute general hospitals

Zaznavanje kulture varnosti pacientov v slovenskih akutnih splošnih bolnišnicah

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Izvleček

Izhodišča: Namen raziskave je bil izmeriti kulturo varnosti pacientov v akutnih splošnih bolnišnicah v Sloveniji in pridobiti izhodiščne podatke za spremljanje izboljšav na področju varnosti pacientov v prihodnosti.

Metode: Uporabili smo anketni vprašalnik s petstopenjsko Likertovo lestvico za ugotavljanje zaznavanja varnosti pacientov za bolnišnice, ki ga je razvil Westat. Pred to študijo smo vprašalnik psihometrično testirali v treh bolnišnicah. Rezultati so pokazali, da modifikacija izvirnega vprašalnika za slovenske razmere ni potrebna. Uporabili smo cenzus. Po izključitvi 159 vprašalnikov, ki niso izpolnjevali meril za vključitev v analizo, smo analizirali 2932 (48,5 %) vprašalnikov. Uporabili smo deskriptivne statistične metode, konfirmativno faktorsko analizo, izračun zanesljivost vprašalnika in njegove konstruktne veljavnosti. Z enosmerno analizo variance smo ugotavljali povezanost velikosti bolnišnice s kulturo varnosti pacientov. Za vsako postavko smo prikazali odstotek pozitivnih, nevtralnih in negativnih odgovorov. Priložnosti za izboljšave smo opredelili kot tiste, pri katerih je 50 % ali manj respondentov odgovorilo pozitivno.

Rezultati: Konfirmativna faktorska analiza je pokazala zadostno skladnost slovenskih podatkov. Zanesljivost instrumenta z vidika notranje skladnosti je bila sprejemljiva. Povprečje pozitivnih odgovorov je bilo 53 %. Nobeno področje ni doseglo ravni dobre varnosti pacientov. Kljub statistično značilni razliki (d.f. 2, 337,006; $p < 0{,}0005$) so bile razlike povezanosti velikosti bolnišnice s kulturo varnosti pacientov praktično zanemarljive.

Zaključek: Raziskava je ugotovila, da zaznavanje kulture varnosti pacientov v slovenskih akutnih splošnih bolnišnicah ni dobro. Ugotovitve nudijo vodstvom in osebju bolnišnic izhodišča za pripravo ukrepov za izboljševanje varnosti pacientov in za sledenje po vpeljanih izboljšavah s ponovnim merjenjem kulture varnosti pacientov čez nekaj časa.

Abstract

Background: The goal of this research was to measure patient safety culture in all Slovenian acute general hospitals.

Methods: The hospital survey on patient safety culture questionnaire developed by researchers at Westat was used. Prior to this study, the questionnaire was psychometrically tested in three pilot hospitals and the results showed no need to modify the original model for the Slovene setting. Responses were scored on the 5-level Likert scale. The questionnaire was distributed to all hospital staff. After the exclusion of 159 questionnaires, which did not fulfil the inclusion criteria, 2932 (48.5 %) questionnaires were analysed. Descriptive statistics, confirmatory factor analysis, reliability of the scales, and construct validity were computed. For each item the percentage of positive, neutral and negative responses were calculated. Areas for improvement were defined as those answered positively by 50 % or less of the respondents. With one-way analysis of variance a comparison of the means among different sizes of the hospitals was performed.

Results: The confirmative factor analysis showed adequate fit for the model and the questionnaire reliability was also adequate. The average positive percentage for all 12 composites was 53 %. Composite scores of patient safety culture revealed that none reached the level that would establish safety strengths. Statistically significant differences of means for hospital size were found (d.f. 2, 337,006; $p < 0{,}0005$) but were practically unimportant.

Conclusion: The survey showed overall low patient safety culture, however it has provided the first insight into patient safety culture in acute general hospitals in Slovenia with several opportunities for improvement.

Povzetek

Izhodišča: Varnost pacientov je v svetu in pri nas predolgo zanemarjena znanost in praksa. Škoda, ki jo doživijo pacienti zaradi napak, dosega epidemiološke razsežnosti, saj so študije pokazale, da v povprečju vsak 10. pacient, ki se zdravi v bolnišnici, doživi škodo za zdravje zaradi napake in ne zaradi narave svoje bolezni ali zapleta, in okrog 0,1 % do 0,2 % jih zaradi napak tudi umre. V Sloveniji študije prevalence ali incidence škodljivih dogodkov nimamo. Pristop k napakam pri nas je zastarel, ker ne upošteva znanosti o varnosti pacientov. Zato tudi ne vemo, kakšna je kultura varnosti pacientov v našem zdravstvu. Ankete o kulturi varnosti pacientov v zdravstvu ocenjujejo zaznavanje postopkov in vedenja zaposlenih v njihovem delovnem okolju in kažejo na prednostne naloge za udejanjanje varnosti. Korist anket o kulturi varnosti pacientov je v pospeševanju drugačnega razmišljanje o varnosti in razumevanje sprememb potrebnih za izboljšave.

Namen raziskave je bil merjenje kulture varnosti pacientov v akutnih splošnih bolnišnicah v Sloveniji, da se pridobijo izhodiščni podatki za spremljanje izboljšav na področju varnosti pacientov v bolnišnicah.

Metode: Izvedli smo neeksperimentalno presečno raziskavo v vseh desetih slovenskih akutnih splošnih bolnišnicah v letih 2010 in 2011.

Vzorec*:* Bolnišnice smo razdelili po številu postelj v male (2), srednje (4) in velike (4). Uporabili smo cenzus in tako vprašalnik razdelili vsem zaposlenim, ki so bili v neposrednem ali posrednem stiku s pacienti. Vrnjenih vprašalnikov smo dobili 51 % (3084 od 6043). Razpon vrnjenih vprašalnikov za posamezne bolnišnice je bil 11 % do 85 %.

Vprašalnik*:* Uporabili smo anketni vprašalnik o zaznavanju varnosti pacientov za bolnišnice (AKVB), ki ga je razvil Westat. Prevedli smo ga v slovenščino in ga priredili v demografskih odsekih pri poklicnih skupinah in strukturi bolnišničnih oddelkov. Pred to študijo smo vprašalnik psihometrično testirali v treh bolnišnicah. Rezultati so pokazali, da modificiranje izvirnega vprašalnika za slovenske razmere ni potrebno. AKVB za lastno oceno spremenljivk sestavlja 12 komponent z 42 postavkami. Pet komponent meri zaznavanje kulture varnosti pacientov na ravni oddelkov, 3 na ravni bolnišnice, 4 pa merijo izide. Vsako komponente sestavljajo 3 ali 4 postavke s 5-stopenjsko Likertovo lestvico.

Analiza*:* Analizirali smo podatke 2932 izpolnjenih vprašalnikov (48,5 %), ker je 152 respondentov odgovorilo na manj kot na en celoten sklop vprašanj, na manj kot polovico vprašanj ali pa so vsako trditev označili enako. Razpon neodgovorjenih spremenljivk za 42 postavk je bil 1–7 %, povprečno 3 %. Neodgovorjene spremenljivke smo pri izračunih izbrisali po parih, če je to zahtevala statistična metoda. S konfirmativno faktorsko analizo smo želeli ugotoviti, ali se uporabljeni model preučevanja kulture varnosti pacientov ujema s slovenskimi podatki. Oceno zanesljivosti z vidika notranje skladnosti instrumenta smo izračunali s Cronbachovim koeficientom α. Za vsak sklop smo izračunali veljavnost konstrukta tako, da smo vzeli povprečje vseh postavk v posameznem sklopu za vsakega respondenta. S Pearsonovim korelacijskim koeficientom smo prikazali povezavo med 12 dejavniki kulture varnosti pacientov. Z enosmerno analizo variance smo ugotavljali vpliv velikosti bolnišnice na kulturo varnosti pacientov. Za vsako postavko smo izračunali odstotek pozitivnih odgovorov (*strinjam se* do *zelo se strinjam*) in (*pogosto, vedno*), ocenjenih s 4 ali 5. Nevtralni so bili odgovori z oceno 3, negativni pa z oceno 1 in 2. Pri 18 postavkah smo odgovore vrednotili obratno. Področje smo ocenili kot *dobro,* če ga je 75 % ali več respondentov ocenilo pozitivno, kot *priložnost za izboljšave*, če ga je 50 % ali manj respondentov ocenilo pozitivno (ostali odgovori so bili negativni ali nevtralni). Rezultate smo ocenili kot statistično signifikantne pri vrednosti $p < 0,05$. Statistične analize smo izvedli s statističnima programoma SPSS , 17 in AMOS 18.

Rezultati: Konfirmativna faktorska analiza je pokazala zadostno skladnost s slovenskimi podatki. Primerjalni indeks (CFI) 0.9 in približek indeksa celotne napake (RMSEA) je bil 0,043. Standardizirane regresijske uteži so bile na splošno velike (> 0,60) z razponom med 0.30 (predaja pacientov in premestitve znotraj bolnišnice) in 0.90 (pogostost sporočanja dogodkov). Zanesljivost instrumenta z vidika notranje skladnosti

– Cronbachov koeficient α (>0.70) je bila sprejemljiva, razen pri petih dejavnikih: *učeča se organizacija, nenehno izboljševanje kakovosti (0,65) nekaznovalni odziv na napake (0.60), ustreznost števila osebja (0,63), celokupno zaznavanje varnosti (0,63) in predaja pacientov in premestitve znotraj bolnišnice (0,69).* Medsebojna povezanost (Pearsonov korelacijski koeficient) med 12 komponentami kulture varnosti pacientov je pokazala slabo korelacijo med nekaterimi dejavniki (r = 0,1 do 0,29). Največ dejavnikov je kazalo srednje močno povezanost (r = 0,30 do 0, 49), le nekaj pa močno povezanost (r = 0,50 do 1,0). Z enosmerno analizo variance smo ugotavljali vpliv velikosti bolnišnice na kulturo varnosti pacientov. Levenov test za homogenost variance je pokazal, da varianca med tremi skupinami ni enaka. Welchov test (stopnja prostosti 2,337,006; p < 0,000) je pokazal statistično značilno razliko med skupinami. Kljub statistično značilni razliki so bile razlike v povprečjih treh skupin majhne. Dobili smo majhen učinek velikosti za enosmerno analizo variance z uporabo kvadrirane ete (0,01). Post hoc analiza s Tukeyevim testom je pokazala, da se je povprečje za male bolnišnice (povpr 3,50; SD 0,57; 95 % CI 3,40–3,60) statistično značilno razlikovalo od velikih bolnišnic (povpr 3,38; SD 0,47; 95 % CI 3,35–3,40), p < 0,045. Povprečje srednje velikih bolnišnic se je statistično značilno razlikovalo od velikih bolnišnic (povpr 3,47; SD 0,48; 95 % CI 3,44–3,50) p < 0,023. Povprečje pozitivnih odgovorov za vseh 12 komponent kulture varnosti pacientov je bilo 53 %. Nobena komponenta zaznavanja kulture varnosti pacientov ni presegla 75 % pozitivnih odgovorov (razpon 32–71 %), kar kaže, da je bolnišnica na področju, ki ga preučuje posamezna komponenta, dobra. Priložnosti za izboljšave (manj kot 50 % pozitivnih odgovorov) so bile ugotovljene na področjih *nekaznovalen odziv na napake, število osebja, podpora najvišje ravni vodstva in timsko delo med bolnišničnimi enotami*. Nobenega dogodka v zadnjih 12 mesecih ni sporočilo 47 % respondentov. Več kot 50 % jih je ocenilo, da je stopnja varnosti pacientov odlična ali zelo dobra.

Zaključek: Raziskava je ugotovila, da zaznavanje kulture varnosti pacientov v slovenskih akutnih splošnih bolnišnicah ni dobro. Vsa področja, ki smo jih izmerili, kažejo, da so potrebne izboljšave. Posebej slabo je zaznavanje na področjih nekaznovalnega odziva na napake in pri pogostnosti sporočanja dogodkov. To je razumljivo pri sedanjem škodljivem pristopu pri obravnavi napak, ko se obtožuje posameznik, čeprav je vzrok za večino napak sistemski. Rezultati tudi niso dobri glede podpore vodstva bolnišnic na najvišji ravni pri varnosti pacientov, saj so bolnišnice brez strategije in programov za varnost pacientov, osebje pa ne zaznava resnične zavzetosti in praktične podpore vodstva za izboljševanje varnosti pacientov. Timsko delo med bolnišničnimi enotami in pri predaji pacientov ter premestitvah znotraj bolnišnice je tudi ocenjeno kot slabo zaradi slabe koordinacije dela med oddelki. Najnižje je bilo ocenjena ustreznost števila osebja. Čeprav je število primerno usposobljenega osebja pomembno za varnost pacientov, to še zdaleč ni edini dejavnik. Rezultati kažejo, da osebje ne pozna dovolj metod in orodij za izboljševanje varnosti pacientov. Izčrpna priporočila, ki so jih prejele bolnišnice, naj bi izboljšala zavedanje o pomenu varnosti pacientov med osebjem s predpostavko, da je vodstvo na najvišji ali srednji ravni sporočilo rezultate osebju na primeren način. Zavzetost in odgovornost vodstva bolnišnic je ključnega pomena pri uvedbi in spremljanju programov varnosti pacientov. Potrebno je usposabljanje vodstva in zaposlenih o metodah in orodjih za izboljševanje varnosti pacientov, uvajanje pravične in prožne kulture, kulture učenja in sporočanja dogodkov in izogibanje starim škodljivim pristopom k vprašanju varnosti pacientov. Ta študija o zaznavanju kulture varnosti pacientov pomeni za vodstva bolnišnic in osebje izhodišče za pripravo ukrepov za izboljševanje varnosti pacientov in za sledenje vpeljanim izboljšavam s ponovnim merjenjem kulture varnosti pacientov po preteku določenega časa.

Background

Safety is a value which, ideally, everyone would agree upon.[1] Adverse events in hospitals are a serious problem, annually killing more people than breast cancer or AIDS.[2]

The World Health Organization estimates that tens of millions of patients worldwide endure disabling injuries or death each year that can be attributed directly to unsafe medical practices and care.[3] Studies in different countries have shown that 2.9 % to 16.6 % of patients in acute hospitals have suffered one or more adverse events and that

approximately half of them could have been prevented.[4-11] Exact figures in Slovenian health care are not known as no study on the prevalence of adverse events has been conducted so far.

Although the focus of dealing with errors in healthcare in many countries has moved to a systemic approach, in Slovenian healthcare the person-oriented approach of shaming and blaming individuals for errors is still prevalent in healthcare organizations, professional bodies and in the legal system. Thus, a culture of fear, instead of the one of patient safety is causing increased rates of "defensive" medicine and error concealment.[12]

A safety culture is a culture where everyone is aware that things can go wrong[2] and is "the product of individual and group values, attitudes, perceptions, competencies and patterns of behaviour that determine the commitment to, and the style and proficiency of, an organisation's safety management."[13]

Measuring safety culture with surveys assesses workforce perceptions of procedures and behaviours in the work environment that indicate the level of priority given to safety.[14]

Tools for the assessment of patient safety culture accelerate understanding of the necessary changes in thinking about safety improvements in healthcare. Surveys on patient safety culture in hospitals give an insight into the attitudes of staff towards patient safety and thus promote actions for improvements based on results.[15]

The goal of this research was to measure patient safety culture in all Slovenian acute general hospitals and establish the basis for future monitoring of improvements in patient safety.

Methods

A cross-sectional non-experimental study was conducted in all ten acute general hospitals in Slovenia during years 2010 and 2011.

Sample: Hospitals were divided according to their bed capacities into small (1 do 199 beds; S), medium sized (200 do 299 beds; M) and large (300 and more beds; L). The hospital survey on patient safety culture (HSOPSC) questionnaire was distributed to all hospital staff involved in patient care directly or indirectly. The overall response rate was 51 % (3084 respondents out of 6043) and the range of response among the hospitals was 11 % to 85 % (Table 1).

Table 1: Percentage of respondents

Hospital	Size	% of respondents
A	M	19
B	L	25
C	S	85
D	M	60
E	L	62
F	S	11
G	L	60
H	S	71
I	L	45
J	S	74

Instrument: The HSOPSC questionnaire developed by researchers at Westat under the Agency for Healthcare Research and Quality contract was used.[16] It is one of the best developed questionnaires.[17] The HSOPSC self- reported questionnaire consists of 12 composites with 42 items of patient safety culture, 5 measuring patient safety culture at unit level, 3 at hospital level and 4 outcome variables of which 2 (overall patient safety grade, and number of events reported in the last 12 months) were single item measures. Each composite is composed of 3 to 4 items. A 5-point Likert response scale of agreement ("Strongly disagree" to "Strongly agree") or frequency ("Never" to "Always") was applied; 18 items were negatively worded.

The questionnaire was translated into the Slovenian language by the author and was then reviewed by a bilingual expert. Thereafter, an independent bilingual translator without knowledge of the original English version translated it back to English.[18] The draft translation was then submitted for pre-testing to several hospital physicians

and nurses as well as to non-clinical staff for comprehension. The pre-test findings were appropriately incorporated into the final version of the questionnaire. Adaptations were made only in demographic items concerning departmental structures of the participating hospitals and with respect to differences in professional groups. Prior to this study, the questionnaire was psychometrically tested in three pilot hospitals and the results showed no need to modify the original 12-factor model for the Slovenian setting.[19]

Data analysis: One hundred and fifty two respondents who answered less than one entire section of the questionnaire, fewer than half of the items in the entire survey or scored all items the same, were excluded from the analysis. Thus 2932 (48.5 %) out of 6043 distributed questionnaires were available for analysis. The range of item non-responses was 1 % to 7 % (average 3 %). Item non-responses were deleted pairwise according to the statistical method used. Confirmatory factor analysis served for confirmation of the HSOPSC model with the Slovenian data. Two fit indices were employed: the comparative fit index (CFI), with values > 0.90 indicating an acceptable fit and > 0.95 indicating a good fit and the root mean square error approximation (RMSEA), with values < 0.05/<0.08 considered as an indication of a good/acceptable model fit to the data.[20]

The reliability of the scale was computed with the Cronbach α coefficient. Construct validity was assessed for each of the 12 composites by finding the mean of the item scores within one factor for every respondent. Next, the correlation among the 12 composites was computed using the Pearson correlation coefficient. The size of the value of the correlation coefficient was defined as poor correlation (r = 0.1 to 0.29), moderate correlation(r = 0.30 to 0. 49) and strong correlation (r = 0.50 to 1.0).[21] Construct validity refers to the degree to which questions asses the underlying thereoretical dimensions–do they asses what they are supposed to.[22] Prior

Table 2: Distribution of the respondents by staff position

Staff position	Respondents	%	Staff position	Respondents	%
Nurse technician	1239	42	Radiologic engineer	69	2
Registered Nurse	650	22	Resident physician	63	2
Physician specialist	228	8	Nursing aid	47	2
Other	182	6	Pharmacist	22	1
Unit clerk	149	5	Physician Intern	11	0
Physiotherapist	73	3	Item non-respondents	126	4
Laboratory technician	73	3	Total	2925	100

Table 3: Distribution of the respondents by work unit

Work unit	Respondents	%	Work unit	Respondents	%
Surgery	495	17	Radiology	114	4
Internal medicine	353	12	Emergency	71	3
Non-specific units	338	11	Day hospital	88	3
Gynaecology and obstetrics	302	11	Pharmacy	79	3
Other	273	9	Laboratory	94	3
Pediatrics	241	8	Anesthesiology	74	3
Intensive care (all types)	148	5	Item non-respondents	152	5
Nursing care	110	4	Total	2932	99

to correlation analysis, preliminary assumption testing was conducted for normality, linearity and homoscedasticity.

Using one-way analysis of variance, a comparison of the means among different--size hospitals was performed, and a post--hoc comparison using the Tukey test was employed to find out where these differences occur. The strength of the differences between means or effect size was calculated with eta square to indicate the relative magnitude of these differences.[23]

Finally, for each item the percentages of positive responses of 4 and 5 , neutral answers of 3, and negative answers of 1 and 2 on the Likert scale, were calculated. The scores in the 18 negatively worded items were reversed. For future comparison over time and benchmarking among the hospitals, we followed the recommendation by Sorra and Nieva,[16] where safety strengths were arbitrarily defined as those positively worded items that 75 % more of the respondents answered positively. Areas for improvement were defined as those where 50 % or less of the respondents answered positively (scores were negative or neutral). Results were considered statistically significant at $p < 0.05$. Practical significance was judged important at a difference level among items or composites of 5 % (146 respondents judge the answer differently). We used statistical programmes SPSS 17 and AMOS 18.

Results

Tables 2 and 3 show the demographic chararacteristics of the respondents.

Eighty seven percent of respondents had direct interaction or contact with patients (item non-responds was 2 %).

The confirmative factor analysis showed adequate fit for the model. CFI was 0.9 and RMSEA was 0.043. The standardised factor loadings were generally large (>0.60) and ranged from 0.30 (Hospital handoffs and

Table 4: Cronbach α coefficient for Slovenia, several other European countries and the USA.

Scales (No. of items)	Cronbach α							
	SI	SK	USA	NL	NO	UK	BE	CH
Composites of patient safety culture at the level of units								
Supervisor/Manager expectations and actions promoting safety (4)	0.75	0.79	0.75	0.70	0.77	0.68	0.77	0.79
Organizational learning—continuous improvement (3)	0.65	0.64	0.76	0.57	0.51	0,66	0.59	0.68
Teamwork within units (4)	0.76	0.80	0.83	0.66	0.77	0.73	0.66	0.75
Communication openness (3)	0.73	0.73	0.72	0.72	0.68	0.67	0.65	0.64
Feedback and communication about error (3)	0.75	0.78	0.78	0.75	0.70	0.80	0.78	0.78
Nonpunitive response to error (3)	0.60	0.77	0.79	0.69	0.64	0.65	0.68	0.70
Staffing (4)	0.63	0.60	0.63	0.49	0.65	0.58	0.57	0.65
Composites of patient safety culture at the level of hospital								
Hospital management support for patient safety (3)	0.81	0.79	0.83	0.68	0.79	0.69	0.72	0.83
Teamwork across hospital units (4)	0.72	0.70	0.80	0.59	0.65	0.70	0.66	0.77
Hospital handoffs and transitions (4)	0.69	0.74	0.80	0.69	0.65	0.77	0.71	0.72
Outcome variables								
Overall perceptions of safety (4)	0.62	0.84	0.84	0.79	0.82	0.83	0.85	0.76
Frequency of event reporting (3)	0.89	0.71	0.74	0.62	0.76	0.67	0.58	0.70

SI, Slovenia; SK, Scotland;[30] USA, The United States of America,[24] NL, The Netherlands,[27] NO, Norway,[26] UK, United Kingdom,[29] BE, Belgium;[25] CH, Switzerland.[28]

transitions) to 0.90 (Frequency of event reporting).

The questionnaire reliability (its internal consistency) was adequate (Cronbach α coefficient (>0.70) except in 5 composites (Table 4): organizational learning—continuous (0.65) non-punitive response to error (0.60), staffing (0.63) , overall perceptions of safety (0.63) and hospital handoffs and transitions (0,69).

Table 5 shows mean composite scores with a 95 % confidence interval and inter-correlations of the 12 composites of patient safety culture. Some showed poor correlation among the composites. Most of the composites were moderately correlated. A strong correlation was found between *Feedback* and *communication about error and Communication openness,* between *Teamwork within units and Organizational learning—continuous improvement,* between *Communication openness* and *Supervisor/Manager expectations and actions promoting safety,* between *Feedback and communication about error* and *Supervisor/Manager expectations and actions promoting safety,* and between *Feedback and communication about error* and *Organizational learning—continuous improvement.* Other relationships were weak to moderate.

One-way analysis of variance compared the means among different-size hospitals. Levens test for homogeneity of variances showed that homogegeneity was violated ($p < 0.004$). Therefore, a robust test of equality of means was calculated using Welch's test of equality of means, which showed statistically significant differences for the three groups(d.f. 2, 337,006; $p < 0.0005$). Post-hoc comparison using the Tukey test indicated that the mean score for the small hospitals (mean 3.50; SD 0.57; 95 % CI 3.40–3.60) was significantly different to large hospitals (mean 3.38; SD 0,47; 95 %CI 3,35–3,40),

Table 5: Mean composite scores, 95 % confidence interval (CI) and inter-correlations between 12 composites (Pearson r, $p < 0.0005$)

Composites	Mean and 95 % CI	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	*F12*
Overall perceptions of safety (F1)	3.47 (3.44–3.50)												
Frequency of event reporting (F2)	3.96 (3.92–4.00)	,200											
Supervisor/Manager expectations and actions promoting safety (F3)	3.64 (3.61–3.67)	,470	,213										
Organizational learning—continuous improvement (F4)	3.63 (3.60–3.66)	,490	,260	,480									
Teamwork within units (F5)	3.55 (3.52–3.58)	,413	,190	,465	,510								
Communication openness (F6)	3.71 (3.68–3.75)	,389	,267	,572	,444	,483							
Feedback and communication about error (F7)	3,59 (3,56–3,63)	,421	,345	,563	,583	,484	,664						
Nonpunitive response to error (F8)	3.11 (3.08–3.11)	,360	,138	,357	,280	,321	,396	,303					
Staffing (F9)	2,73 (2,69–2,73)	,461	,106	,326	,253	,260	,232	,231	,374				
Hospital management support for patient safety (F10)	3.09 (3.02–3.06)	,422	,211	,368	,428	,375	,338	,418	,330	,325			
Teamwork across hospital units (F11)	3.20 (3.14–3.17)	,402	,199	,351	,385	,437	,371	,393	,288	,290	,558		
Hospital handoffs and transitions (F12)	3.44 (3.38–3.41)	,363	,196	,296	,295	,289	,309	,283	,269	,307	,386	,600	

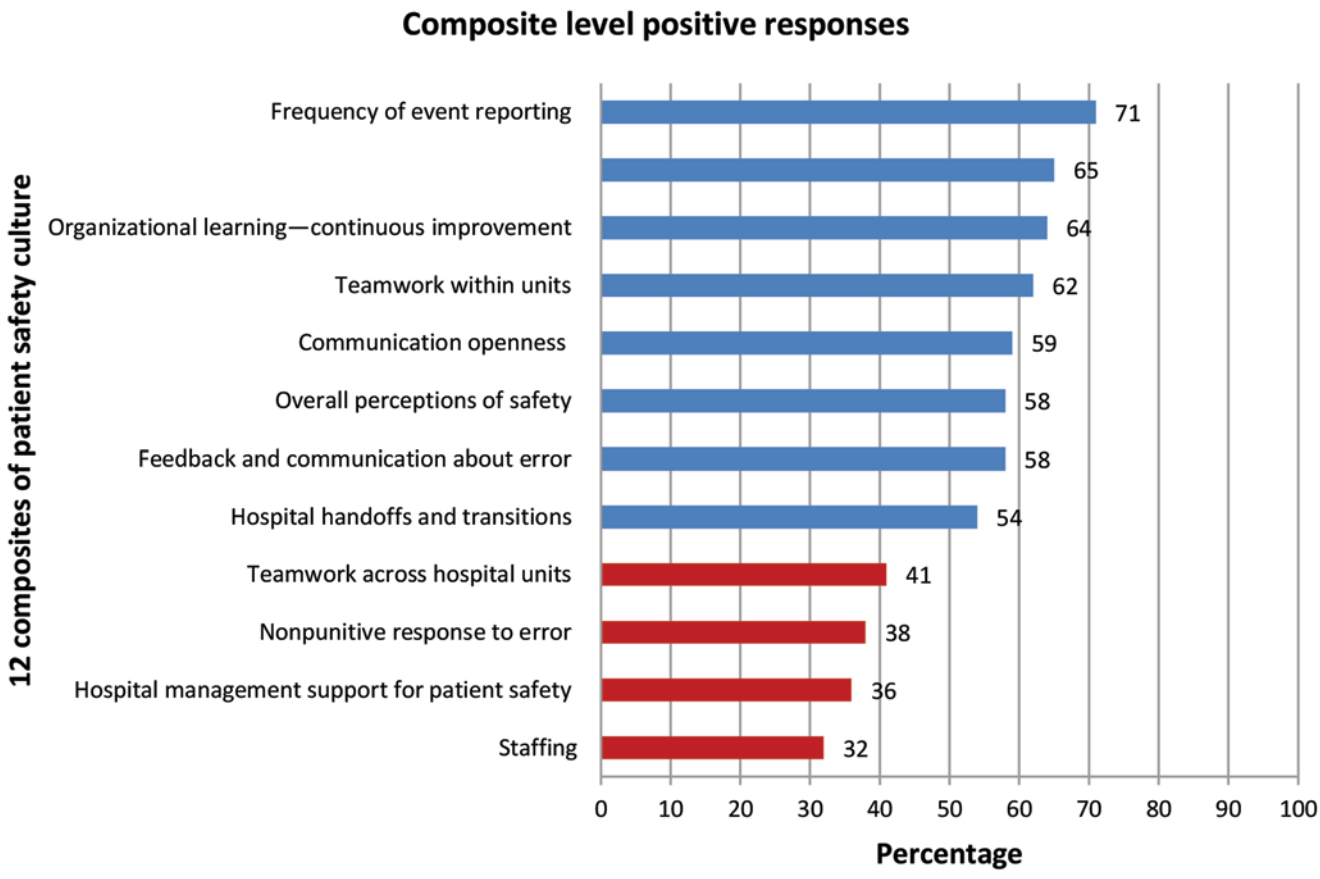


Figure 1: Composite level of positive percentage of patient safety scores. Red colour indicates priorities for improvement.

$p < 0.045$. The mean score for the medium size hospitals was also statistically significantly different to the large hospitals (mean3.47; SD 0.48; 95 %CI 3.44–3.50) $p < 0.023$. Despite statistically significant differences the actual difference in mean scores between the groups was small. The effect size calculated using eta squared was 0,01.

Composite scores of patient safety culture revealed that none reached the level of 75 % that would establish safety strengths (Figure 1). The average positive percentage for all 12 composites was 53 %.

Two single item outcome measures–the percentage of events reported in the past 12 months are shown in Figure 2 and an overall grade of patient safety in Figure 3.

Items arranged in composites of patient safety culture with percentage of positive, neutral and negative responses at hospital level are shown in Figure 4 and at unit level in Figure 5.

Discussion

This is the first survey on patient safety culture in Slovenian general acute hospitals. The previous study on the psychometric properties of the questionnaires used, revealed that the Hospital Survey on Patient Safety Culture is an appropriate instrument to assess patient safety culture in our hospitals.[19]

In the present study, confirmative factor analysis showed an adequate fit for the model and the questionnaire reliability was adequate and was comparable to other studies.[24-30]

The construct validity was satisfactory for all factors. Most of the 12 composites of patient safety culture were moderately correlated. The moderate correlations of the factors show that there are no two factors measuring the same construct.

The survey showed overall low patient safety culture. The results of the present study are not very encouraging and the main value is perhaps in raising awareness of the problem as safety environment is conside-

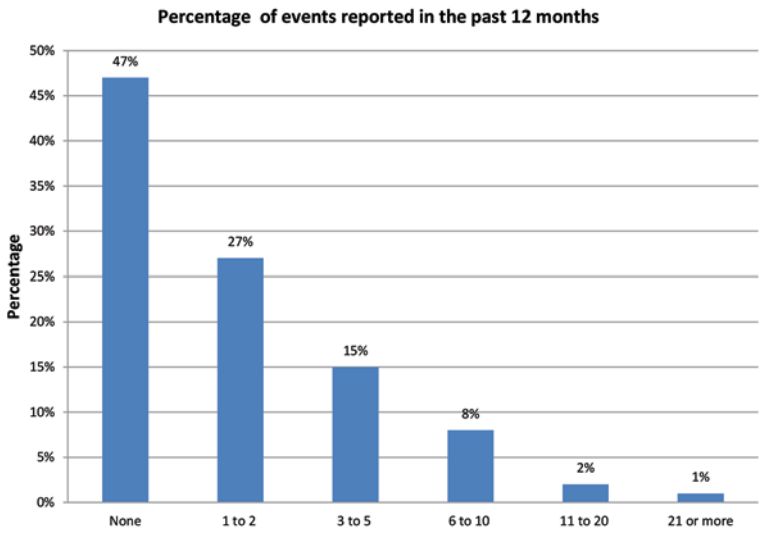
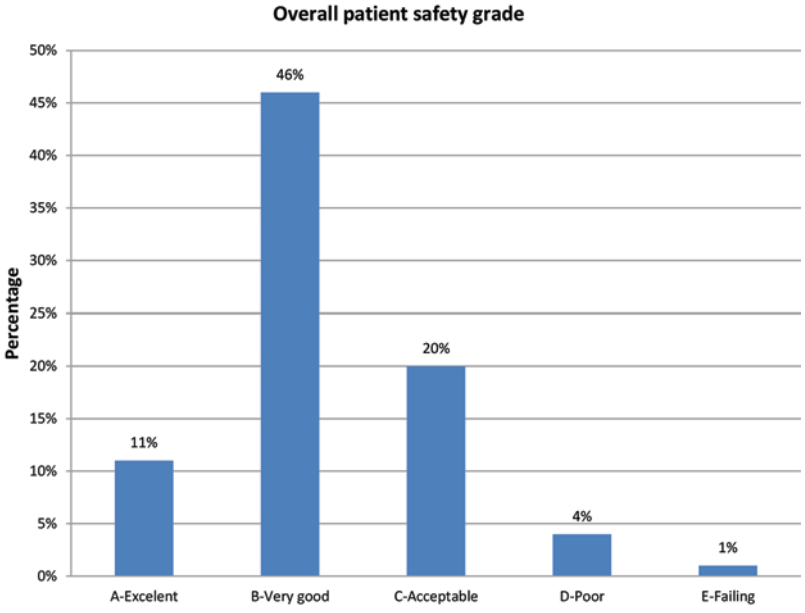


Figure 2: Percentage of events reported in the last 12 months shows that almost 50 % of respondents did not report any event.

red the most important barrier to improving safe patient care.[31]

The lowest percentage of positive responses were on the composites of teamwork across hospital units, non-punitive response to errors, hospital management support for patient safety, and staffing. Programs for team work and standardized communication are badly needed to impove coordination of care among diffrent departments. The positive percentage on nonpunitive response was low and this is shown also in the frequency of reported events as almost 50 % did not report any event in the last 12 months. Health care personnel are still afraid to be punished if they disclose errors.

Figure 3: More than 50 % of respondents gave an excellent or very good overall patient safety grade.



This is quite understandable in the present counter-productive approach of punishing individuals for errors that arise mainly due to systemic failures. Hospital management support for patient safety also scored low and the reason for that may be attributable to the fact that in many hospitals the top management believes that patient safety will be improved by removing "bad apples" from their hospitals. They also do not provide for patient safety as none of the hospitals has a fully functioning patient safety program.[32] The lowest positive score was on staffing. Although appropriate staffing is important for patient safety it is not the sole factor.[33]

Statistical significance between small and large hospitals and between medium-size and large hospitals was reached, but the differences were practically not significant. Thus, regardless the hospital size, patient safety culture in all Slovenian acute general hospitals needs to be substantially improved. Each of the participating hospitals received an extensive report for their own results together with the results for each department and professional group along with recommendations for improvement. It is up to them to implement the recommendation rather than argue about the results that do not support their expectations of further promoting the syndrome of vulnerable organization. This syndrome is composed of three interacting and self-perpetuating elements: blaming individuals, denying the existence of systemic error provoking continuous vulbnerability to errors, and the blinkered pursuit of productive and financial indicators.[34]

The percentage of events reported in a 12-month period was low (Figure 2), as though the respondents thouhgt that they report frequently (Figure 1), which may be a socially desirable answer.[35-36] The reason for low event reportingis probably attributable to poor understanding of why patient safety incidents happen and therefore ignorance of near misses, which are generally not at all considered errors, as they do not cause harm to the patient. Thus, near misses are ignored and no attempts are made to find solutions to prevent them from occurring in the future and possibly causing an adverse event.

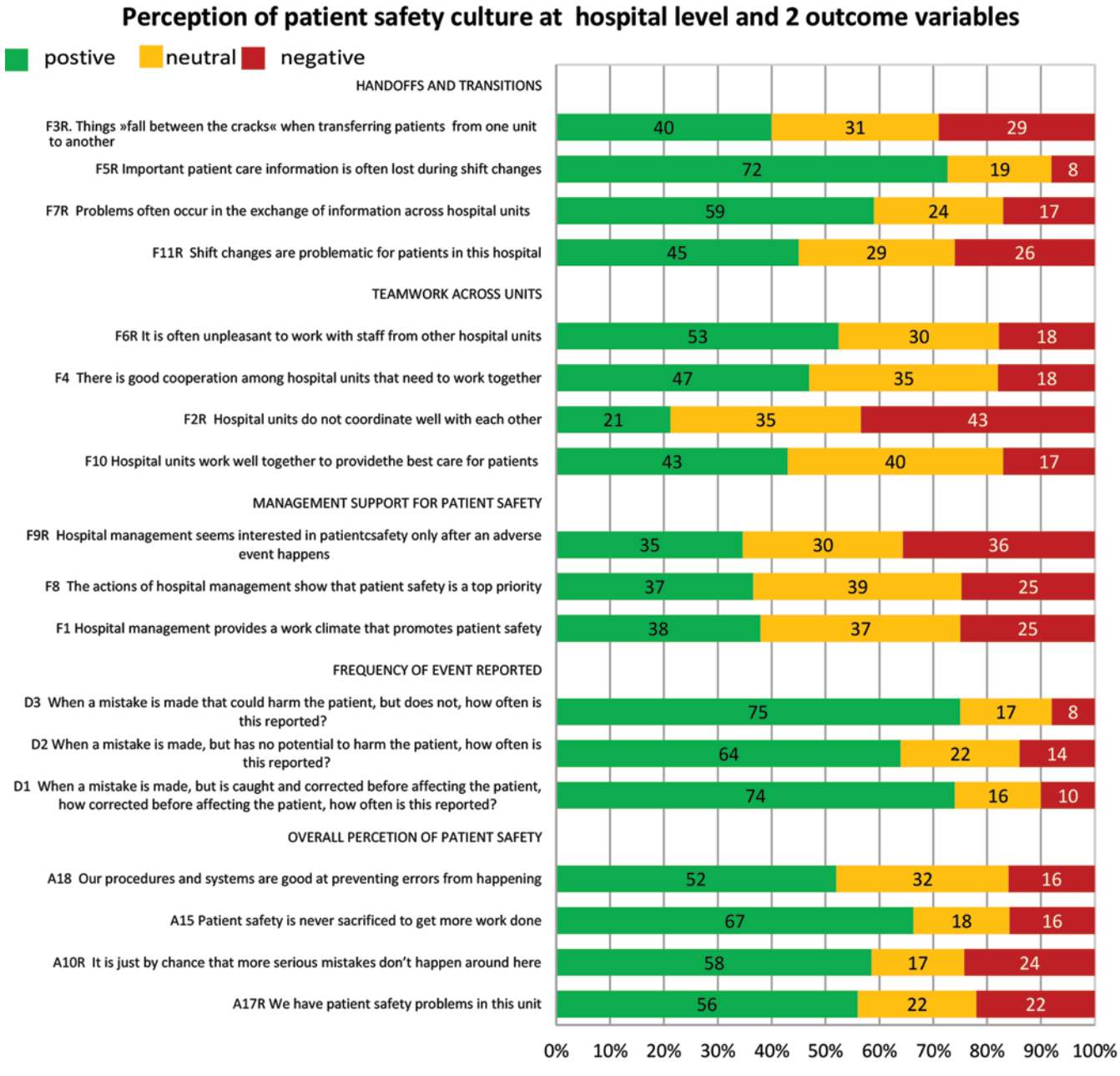


Figure 4: Perception of patient safety culture at hospital level and outcome variables. Note that composites of items are shown in Figure 1. Letter R denotes reverse wording of an item.

The study suggests that the first step to patient safety improvement should be obtaining the support of hospital management and assuming a non-punitive approach to those who make and report medical errors. If the problem of personnel not reporting events is to be resolved, any barriers to reporting should be identified and addressed. This study can help healthcare managers in each hospital to take action and establish appropriate strategies and programs for patient safety based on a systemic and systematic approach. Without understanding the system approach that assumes that people will make mistakes, and that the system that surrounds them should provide a safety net for these mistakes, no progress can be made in preventing harm to patients due to errors.[37]

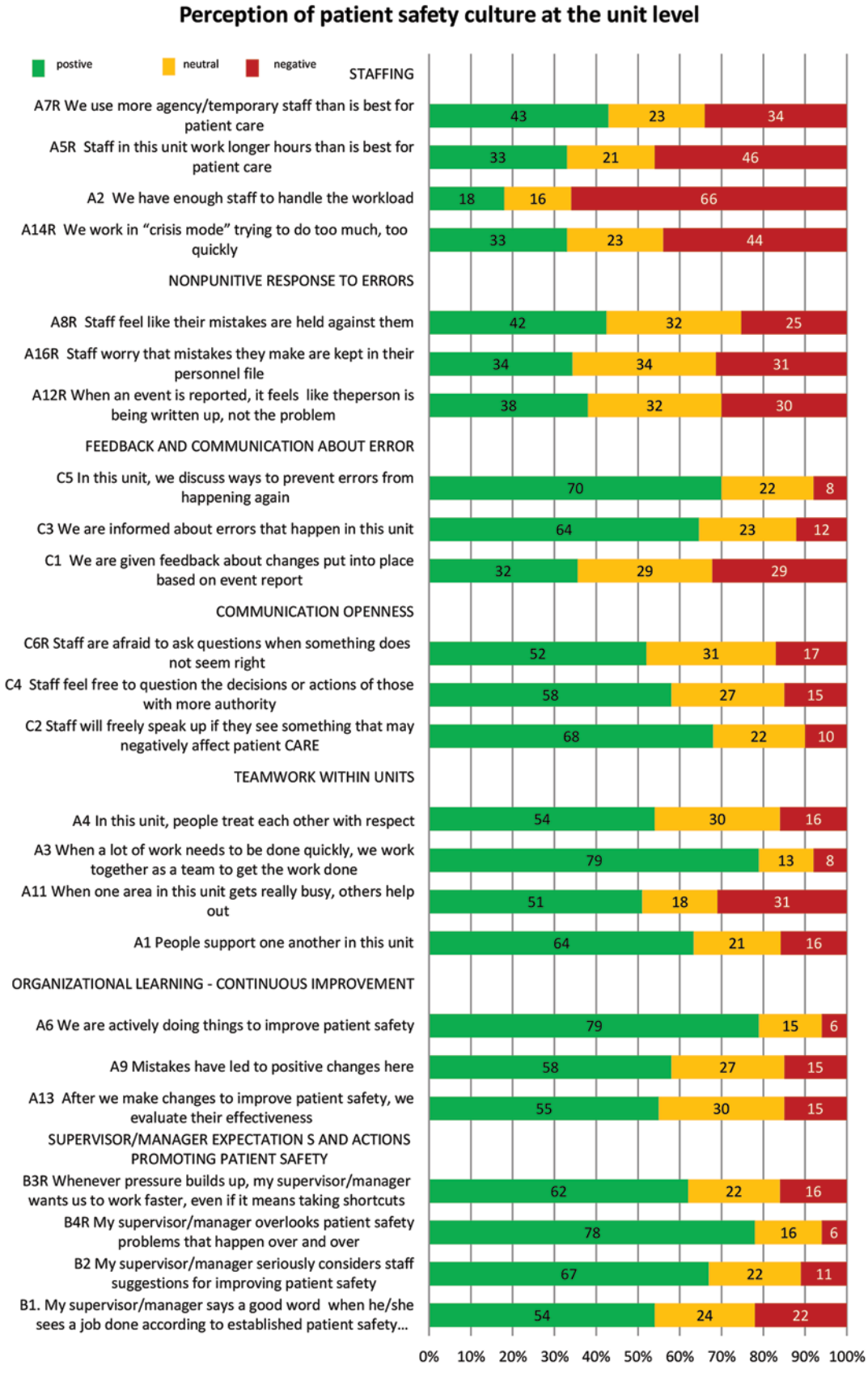


Figure 5: Perception of patient safety culture at unit level. Note that composites of items are shown in Figure 1. Letter R denotes reverse wording of an item.

The results of this study should influence the general public, those responsible for professional regulations and the legal system of Slovenia. In all three groups, strongly embedded thinking of individual blame for an error based on non-scientific evidence is resiliently promoting an unjust culture and a culture of fear causing health care professionals to hide errors and practice "defensive" medicine, thus dangerously preventing learning from errors and finding solutions for their prevention.[12]

Study limitations

Firstly, self-report questionnaires have their weaknesses. Individuals set in a culture are often unconscious of the culture that surrounds them. There is also the possibility of socially desirable responses where people tend to show the best picture of themselves to others, hiding their true feelings about certain situations.[36-37]

Secondly, despite the fact that hospitals were asked to administer the survey by using a census, the response rate was extremely low in some hospitals, reflecting the non-involvement of the management to promote the survey, so that the results cannot be generalized to the whole hospital population but are valid only for the respondents. Therefore, no effort was made to compare results among the hospitals. The low response rates also showed that patient safety culture in these hospitals is unimportant, at least for the management.

Thirdly, the deeper aspects of culture in terms of underlying values, beliefs, and norms within an organization may be inadequately captured with self-report quantitative instruments. Quantitative culture data should therefore be supplemented with other sources of information about patient safety such as qualitative information from staff interviews and focus groups, or procedural safety checklists used in traditional safety audits.

Conclusion

The study provides the first insight into patient safety culture in acute general hospitals in Slovenia. The results show many opportunities for improvement. Hopefully, the extensive reports received by the hospitals will raise awareness of patient safety among personnel on the assumption that hospital management appropriately communicate the results to the healthcare staff. The role of management is one of the key prerequisites for the implementation and monitoring of patient safety programmes. Education on patient safety methods and tools is needed among management and healthcare professionals. Unfortunately, this will be a long process as the pathway taken in Slovenia to deal with patient safety problems has taken the old and dangerous direction of blaming and shaming individuals rather than a just and flexible culture with a system approach that promotes learning and is aimed at the prevention of adverse events.

References

1. Vincent C. Patient Safety.Chichester: John Wiley and Sons; 2010.
2. Institute of Medicine: To err is human: building a safer health system Washington DC: National Academy Press; 2000.
3. WHO: Call for more research on patient safety. Dosegljivo na: http://www.who.int/ mediacentre/ news/releases/2007/pr52/en/index.html.
4. Brennan TA, Leape LL, Laird NM, Hebert L, Localio AR, Lawthers AG et al. Incidence of adverse events and negligence in hospitalized patients. Results of the Harvard Medical Practice Study I. N Engl J Med 1991, 324: 370–6.
5. Wilson RM, Runciman WB, Gibberd RW. The quality in Australian health care study. MedJ Aust 1995, 163: 458–71.
6. Thomas EJ, Studdert DM, Burstin HR, Orav EJ, Zeena T, Williams EJ, Howard KM, et al. Incidence and types of adverse events and negligent care in Utah and Colorado. Med Care 2000, 38: 261–71.
7. Schioler T, Lipczak H, Pedersen BL, Mogensen TS, Bech KB, Stockmarr A, et al. Incidence of adverse events in hospitals. A retrospective study of medical records (Danish). Ugeskr Laeger 2001, 163: 5370–8.
8. Vincent C, Neale G, Woloshynowych M.: Adverse events in British hospitals: preliminary retrospective record review. BMJ 2001, 322: 517–9.
9. Davis P, Lay-Yee R, Briant R. Adverse events in New Zealand public hospitals I: occurrence and impact. N Z Med J 2002, 115:U271
10. Baker GR, Norton PG, Flintoft V. The Canadian Adverse Events Study: the incidence of adverse

events among hospital patients in Canada. CMAJ 2004, 170: 1678–86.
11. Michel P, Quenon JL, De Sarasqueta AM, Scemama O: Comparison of three methods for estimating rates of adverse events and rates of preventable adverse events in acute care hospitals. BMJ 2004, 328: 199.
12. Robida A. Varnostni zaplet pri pacientu–nova znanost, stara praksa. Odgovornost v zdravstvu. 19. posvetovanje Medicina in pravo na temo, Maribor, 2010 Mar 26. -27 Maribor, Slovenija.
13. Fourth International Atomic Energy Agency. Safety culture. International Safety Advisory Group, Safety Series 75-INSAG-4. Vienna: International Atomic Energy Agency, 1991.
14. Ashkanasy N, Broadfoot L, Falkus S. Questionnaire measures of organizational culture. In: Ashkanasy N, Wilderom C, Peterson M, eds. Handbook of organizational culture and climate. Thousand Oaks: Sage; 2000.
15. Singla AK, Barrett T, Kitch T. Assessing patient safety culture: A review and synthesis of the measurement tools. Patient Saf 2006, 2 : 105–15.
16. Sorra JS, Nieva VF. Hospital Survey on Patient Safety Culture. (Prepared by Westat,under Contract No. 290–96–0004). AHRQ Publication No. 04–0041. Rockville, MD:Agency for Healthcare Research and Quality, September 2004.
17. Flin R, Burns C, Mearns K. Measuring safety climate in health care. Qual. Saf Health Care 2006; 15; 109–15.
18. Sperber AD: Translation and validation of study instruments for crosscultural research. Gastroenterology 2004, 126: 124–8.
19. Robida A. Hospital Survey on Patient Safety Culture in Slovenia: a psychometric evaluation. Int J Qual Health Care 2013, 25: 469–75.
20. Hu LT, Bentler PM. Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. Structural Equation Modeling, 1999, 6: 1–55.
21. Cohen JW. Statistical power analysis for the behavioral sciences.Hilldadale: Lawrence Erlbaum Ass; 1988.
22. Lang TA, Secic M. How to report statistics in mediciene. Philadelphia: American College of Physician; 2006.
23. Tabachnick BG, Fidell LS. Using multivariate statistics. Boston:Pearson Education; 2007.
24. Sorra JS, Dyer N. Multilevel psychometric properties of the AHRQ hospital survey on patient safety culture. BMC Health Serv Res 2010; 10: 199.
25. Hellings J, Schrooten W, Klazinga N, et al. Challenging patient safety culture: survey results. Int J Health Care Qual Assur 2007; 20: 620–32.
26. Olsen E. Reliability and validity of the hospital survey on patient safety culture at a Norwegian hospital. In: Øvretveit J, Sousa P, eds. Quality and Safety Improvement Research, National School of Public Health, 2008: 173–86.
27. Smits M, Dingelhoff IC, Wagner C, et al. The psychometric properties of the 'Hospital Survey on Patient Safety Culture' in Dutch hospitals. BMC Health Serv Res 2008; 8: 230.
28. 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.
29. Waterson PE, Griffiths P, Stride C, et al. Psychometric properties of the hospital survey on patient safety: findings from the UK. Qual Saf Health Care 2010; 19: 1–5.
30. Sarac C, Flin R, Kathryn Mearns K, et al. Hospital survey on patient safety culture: psychometric analysis on a Scottish sample. BMJ Qual Saf. 2011; 20: 842–8.
31. Cooper JB. Developing a culture of safety. Biomed Instr Technol. 2003; 37: 212–14.
32. Robida A. Kultura varnosti pacientov - pilotna raziskava o bolnišnični kulturi varnosti pacientov. Varnost - rdeča nit celostne obravnave pacientov 4. dnevi Angele Boškin 2011 Apr 7-8 ; Gozd Martuljek, Slovenija.
33. Aiken LH, Clarke SP, Sloane DM et al. Hospital nurse staffing and patient mortality, nurse burnout, and job dissatisfaction. JAMA. 2002; 288: 1987–93.
34. Reason J T, Carthey J, de Leval M R. Diagnosing "vulnerable system syndrome": an essential prerequisite to effective risk management. Quality in Health Care. 200; 110 Suppl II:ii21–ii25.
35. Tourangeau R, YanT. "Sensitive questions in surveys. Psychological Bulletin. 2007; 133: 859–83.
36. vandeMortel TF. Faking it: social desirability response bias in selfreport research. Aust J Adv Nurs. 2008; 25: 40–8.
37. Dankelman J, Grimbergen CA. Systems approach to reduce errors in surgery. Surg Endosc. 2005; 19: 1017–21.