

A comparative assessment of Patient Safety Culture in a tertiary maternity hospital

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Abstract

Introduction

Obstetrics is a speciality significant for its high stress, high stakes and high expectations. A positive Patient Safety Culture (PSC) is required to ensure positive outcomes for mother and baby. The Safety Attitudes Questionnaire (SAQ) is a validated and benchmarked tool to assess PSC and positive scores correlate with improved outcomes. Our aim was to assess PSC and compare with national and international benchmarks.

Methods

We performed a cross-sectional, quantitative survey of staff in our institution using the SAQ. Ethical approval was obtained. Themes explored included: "Teamwork Climate"; "Safety Climate"; "Job Satisfaction", "Stress Recognition"; "Perceptions of Management" and "Working Conditions". Descriptive statistics and mean responses to Likert scale were calculated. Scores were compared with national and international benchmarks.

Results

70 staff responded (79% response rate). The mean responses to "Teamwork Climate" (82.1) and "Job Satisfaction"(82.8) themes were most positive. Mean responses from staff in our institution were more positive in almost all themes compared with benchmarks, particularly in "Teamwork Climate" and "Perceptions of Management". Perceptions of staffing levels and of the impact of fatigue on performance were negative however.

We propose that strategies such as quarterly multidisciplinary clinical simulations and clinical management such as our institution's "Mastership" model positively influence our PSC and can be explored as improvement strategies in other institutions.

Introduction

Improving patient safety is a priority for health services the world over. Avoidance of error is often targeted as a way of achieving this. Two to four percent of all deaths in the United States are reported to be due to medical error.¹ In Europe, medical error and adverse events occur in up to

twelve percent of hospital admissions.² The concept of “safety culture” was conceived following the Chernobyl nuclear disaster and was defined as “the assembly of characteristics and attitudes in organizations and individuals which establish that, as an overriding priority, safety issues receive the attention warranted by their significance”.³ It is a key tenet of high reliability organisations (HROs) such as nuclear and aviation industries and has informed efforts in delivery of healthcare. Similarly to an HRO, healthcare is a system which requires as close to error-free performance as possible. Improving Patient Safety Culture (PSC) was a key recommendation made in the landmark 1999 report on avoiding error by the United States Institute of Medicine.¹ Since then, numerous benchmarked instruments have been developed to assess this.⁴⁻⁶

The Safety Attitudes Questionnaire (SAQ) has been adapted to healthcare from other high reliability organisations and has been validated in the UK, New Zealand, USA and Canada.⁴ It is the most commonly used and rigorously validated tool,⁷ giving an organisation the benefit of a “snap-shot” of its safety culture by gaining the perceptions of frontline staff. A significant percentage of errors are due to poor teamwork and communication and the SAQ identifies these among other themes.⁸ High scores in this questionnaire have been shown to correlate with decreased incidences of staff turnover, post-operative infection and inpatient mortality.⁷

Obstetrics is a unique scion of medicine. Its clinical presentations are often characterized by their high stress, high stakes and high expectations. The nature of the speciality requires multidisciplinary teamwork and effective organizational systems to achieve a safe patient outcome. These requirements have been recognised and described by the World Health Organization, whom, in addition to these, list transparent clinical governance, communication, standardized practice, auditing systems and adequate staffing levels as essential for identification, prevention and management of risk in obstetrics.⁹ Ireland maintains one of the lowest maternal mortality rates (MMR) globally (3:100,000).¹⁰ It has at many stages in history led the way in maternity care with novel practices such as active management of labour.¹¹ Its three stand-alone maternity hospitals employ a unique clinical management model whereby executive management of the hospital is held in seven-year terms by an elected Consultant Obstetrician/Gynaecologist, who remains in practice throughout his or her tenure. This model was developed in Dublin in 1745 upon the foundation of the Rotunda Hospital by Bartholomew Moss and remains in place today.¹²

While the SAQ has been used effectively to assess PSC in individual medical and neonatology units, there has been no national strategy to assess PSC as of yet in Ireland.¹³⁻¹⁵ Our aim therefore is twofold: to add an obstetric viewpoint to our national evidence base and compare our National Maternity Hospital to both national and international benchmarks. We wish to view this comparison in light of our institution’s “Mastership” management model and our country’s standing as a safe place to give birth.

Methods

We used the 35-item Likert questionnaire to perform a cross-sectional, quantitative survey in the theatre unit of our institution. It is a tertiary stand-alone maternity hospital which facilitates approximately 9,000 deliveries and treats 9,000 gynaecology patients annually. Respondents included Consultant and Trainee Obstetrician/Gynaecologists, Anaesthesiologists and Neonatologists, Midwives/Nurses and Ancillary Staff. Themes explored included: “Teamwork Climate”; “Safety Climate”; “Job Satisfaction”, “Stress Recognition”; “Perceptions of Management” and “Working Conditions”. The survey was conducted over a two week period in November, 2019.

The response scale ranged from 1 (disagree strongly) to 5 (strongly agree) using a 5-point Likert scale. The scores were then transformed to a numerical 100-point scale to aid in analysis of the results (1=0, 2=25, 3=50, 4=75 and 5=100) to allow comparison to published benchmarks. Each domain score equals the mean score of its component survey items.

Responding to the questionnaire was voluntary and anonymous. Ethical approval was obtained from the local ethics committee.

Data were analysed using SPSS version 24.¹⁶ A composite scale score was calculated by summing the scores of the items with the scale. Descriptive statistics were used for all survey items and domains. Internal consistency within subgroups was measured via Cronbach alpha to gauge its reliability. Alpha coefficient ranges in value from 0 to 1 are used to describe the reliability of factors extracted from the Likert scale.

Each respondent’s scores for the six domains were determined by calculating the sum of their responses for each question in the domain and dividing by the number of questions in the domain. Descriptive statistics were used to calculate the mean score and standard deviation.

Results

Demographics

There were 70 responses in total for a response rate of 79%. The highest represented respondents were trainee Obstetrician/Gynaecologists (27.1%). 30% of respondents had between 11 and 20 years of experience and 65% were female (Table 1).

Table 1. Demographics of survey respondents (changes made to table as per reviewer)

Variable	Number (n)	%
Sex		
Female	44	62.8
Male	24	34.3
Undisclosed	2	2.9
Total	70	100
Experience		
Less than one year	9	12.9
1 - 2 years	7	10.0
3 - 4 years	12	17.1
5 - 10 years	11	15.7
11 - 20 years	21	30.0
> 20 years	8	11.4
Undisclosed	2	2.9

Variable	Number (n)	%
Role		
Consultant Obstetrics/Gynaecology	12	17.1
Consultant Anaesthesia	5	7.1
NCHD Obstetrics/Gynaecology	19	27.1
NCHD Anaesthesia	10	14.3
NCHD Neonatology	6	8.6
Midwife/Nurse Manager Anaesthesia	1	1.4
Midwife/Nurse Staff Anaesthesia	7	10.0
Midwife/Nurse Manager Theatre	4	5.7
Midwife/Nurse Staff Theatre	2	2.9
Healthcare Assistant	2	2.9
Porter	2	2.9

Table 2 describes responses to individual components of the survey and proportion of positive and negative responses.

Domain	Statement	Agree (%)	Disagree (%)	Neutral (%)	Missing (%)
Teamwork Climate					
	Midwife/Nurse input is well received in this clinical area	64 (91.4)	1 (1.4)	4 (5.7)	1 (1.4)
	In this clinical area, it is difficult to speak up if I perceive a problem with patient care	62 (88.6)	3 (4.3)	4 (5.7)	1 (1.4)
	Disagreements in this clinical area are resolved appropriately (i.e., not who is right, but what is best for the patient).	57 (81.4)	2 (2.8)	10 (14.3)	1 (1.4)
	I have the support I need from other personnel to care for patients	69 (98.6)	0	1 (1.4)	0
	It is easy for personnel here to ask questions when there is something that they do not understand	68 (97.1)	1 (1.4)	1 (1.4)	0
	The physicians and midwives/nurses here work together as a well-coordinated team	63 (90.0)	3 (4.3)	4 (5.7)	0
Safety Climate					
	I would feel safe being treated here as a patient	68 (97.1)	0	1 (1.4)	1 (1.4)
	Medical errors are handled appropriately in this clinical area	59 (84.3)	1 (1.4)	10 (14.3)	0
	I know the proper channels to direct questions regarding patient safety in this clinical area	54 (77.1)	6 (8.6)	9 (12.9)	1 (1.4)
	I receive appropriate feedback about my performance	32 (45.7)	19 (27.1)	16 (22.9)	3 (4.3)
	In this clinical area, it is difficult to discuss errors	50 (71.4)	12 (17.1)	5 (7.1)	3 (4.3)
	I am encouraged by my colleagues to report any patient safety concerns I may have	42 (60.0)	8 (11.4)	17 (24.3)	3 (4.3)
	The culture in this clinical area makes it easy to learn from the errors of others	42 (60.0)	7 (10.0)	20 (28.6)	1 (1.4)
Job Satisfaction					
	I like my job	65 (92.9)	0	4 (5.7)	1 (1.4)
	Working here is like being part of a large family	60 (85.7)	3 (4.3)	6 (8.6)	1 (1.4)
	This is a good place to work	63 (90.0)	0	5 (7.1)	2 (2.9)
	I am proud to work in this clinical area	65 (92.9)	0	3 (4.3)	2 (2.9)
	Morale in this clinical area is high	49 (70.0)	2 (2.9)	17 (24.3)	2 (2.9)
Stress Recognition					
	When my workload becomes excessive, my performance is impaired	52 (74.3)	8 (11.4)	8 (11.4)	2 (2.9)
	I am less effective at work when fatigued	54 (77.1)	4 (5.7)	10 (14.3)	2 (2.9)
	I am more likely to make errors in tense or hostile situations	52 (74.3)	8 (11.4)	8 (11.4)	2 (2.9)
	Fatigue impairs my performance during emergency situations (e.g. emergency resuscitation, seizure)	39 (55.7)	16 (22.9)	12 (17.1)	3 (4.3)
Perceptions of Management					
	Management support my daily efforts	40 (57.1)	6 (8.6)	22 (31.4)	2 (2.9)
	Management do not knowingly compromise patient safety	56 (80.0)	4 (5.7)	7 (10.0)	3 (4.3)
	Management are doing a good job	49 (70.0)	3 (4.3)	16 (22.9)	2 (2.9)
	The "difficult colleague" is dealt with constructively by management	21 (30.0)	22 (31.4)	25 (35.7)	2 (2.9)
	I get adequate, timely information about events that might affect my work from management	34 (48.6)	13 (18.6)	21 (30.0)	2 (2.9)
Working Conditions					
	The levels of staffing in this clinical area are sufficient to handle the number of patients	12 (17.1)	42 (60.0)	14 (20.0)	2 (2.9)
	This hospital does a good job of training new personnel	48 (68.6)	10 (14.3)	10 (14.3)	2 (2.9)
	All the necessary information for diagnostic and therapeutic decisions is routinely available to me	46 (65.7)	4 (5.7)	17 (24.3)	3 (4.3)
	Trainees in my discipline are adequately supervised	50 (71.4)	6 (8.6)	11 (15.7)	3 (4.3)
No domain					
	I experience good collaboration with midwives/nurses in this clinical area	64 (91.4)	1 (1.4)	3 (4.3)	2 (2.9)
	I experience good collaboration with doctors in this clinical area	63 (90.0)	0	4 (5.7)	2 (2.9)
	Communication breakdowns that lead to delays in delivery of care are common	37 (52.9)	20 (28.6)	11 (15.7)	2 (2.9)
	My suggestions about safety would be acted upon if I expressed them to management	44 (62.8)	2 (2.9)	24 (34.3)	0

Table 2. Responses to SAQ

Table 3 compares mean response for each subgroup and compares it to national and international benchmarks.

Themes	Ireland: NMH: Mean (SD)	Ireland: NICU: Mean (SD)	Ireland: AMU: Mean (SD)	Ireland: Major University Hospital: Mean (SD)	International Benchmark: Mean (CI)
Teamwork Climate	82.1 (12.3)	71.2 (24.3)	73.7 (14.9)	78.9 (18.7)	68.5 (68.0, 68.9)
Safety Climate	71.6 (13.2)	68.2 (26.7)	71.0 (15.8)	73.6 (20.4)	65.9 (65.5, 66.3)
Job Satisfaction	82.8 (13.7)	74.4 (27.8)	67.9 (19.4)	80.2 (21.3)	63.6 (63.0, 64.1)
Stress Recognition	73.1 (20.2)	75.3 (27.8)	74.7 (17.1)	71.9 (24.6)	67.8 (67.3, 68.3)
Perceptions of Management	64.4 (15.0)	50.7 (27.8)	48.0 (19.2)	51.6 (24.9)	46.4 (45.9, 46.8)
Working conditions	60.0 (16.1)	59.6 (25.9)	58.2 (21.9)	46.5 (25.8)	55.9 (55.3, 56.4)

Table 3. Mean response to SAQ compared with published benchmarks. NICU¹⁴; AMAU¹³; University Hospital¹⁵; International⁴

Discussion

Over the course of two weeks we surveyed frontline staff associated with obstetric theatre in a tertiary stand-alone maternity hospital to assess its PSC. Several points of discussion emerged from the results.

Our institution compared favourably with both national and international benchmarks. Mean responses were more positive in all themes, except for “Stress Recognition” where responses to our survey produced lower means than those in both the Irish NICU and Irish university hospital surveys; and “Safety Climate”, in which staff surveyed from the national university hospital responded more positively (Table 3). In particular, mean responses under “Teamwork Climate” and “Perceptions of Management” themes were markedly higher than the other institutions studied as well as the international benchmarks.

Our institution runs quarterly multi-disciplinary team simulations with all specialties within the hospital (Obstetrics/Gynaecology, Anaesthesiology, Neonatology, Nursing and Midwifery). The simulations are based on PROMPT (PRactical Obstetric MultiProfessional Training) and consist of simulations of a range of critical scenarios including maternal collapse, seizures in pregnancy, post-partum haemorrhage and sepsis. Scenarios are followed by an immediate debrief focusing on communication issues, situational awareness, leadership/followership and other human factors. Optimisation of these factors through training have been shown to improve and effect change in teamwork and communication, especially during emergencies.^{17, 18} This type of training in healthcare is an adaptation of Crew Resource Management which has its origins in the aviation industry, having found that up to eighty per cent of critical incidents were due to human error.¹⁹ This is mirrored in obstetrics where poor communication and incoherent team work disproportionately contribute to adverse outcomes.²⁰ Our survey shows that 91% of staff found they experienced good collaboration with nursing/midwifery staff and 90% experienced good

collaboration with doctors (Table 2). This reciprocity has not been found in other applications of this survey in theatre, ICU and medical settings.^{13, 21} These studies have found that physician perception of teamwork with non-physician is not mirrored by non-physicians' perception of teamwork with them. It is encouraging that targeting this in our institution with structured simulation exercises has led to a positive perception of teamwork climate amongst all our staff and harmony between disciplines.

Our review of the literature identified that Ireland is an extremely safe place to give birth. Its MMR is 3:100,000 births compared with the global MMR of 211. It is substantially lower than Europe's MMR of 10 and incomparable with the MMR of the world's Least Developed Countries (415).¹⁰ There are many reasons for these variations. The wealth of a nation, its citizens' ability to access healthcare, staffing levels and quality of hospital performance all contribute. Perhaps improving safety climate is a simple tool to improve metrics like MMR and perinatal mortality. It has been shown again and again that human factors play a disproportionate role in poor outcomes. It is possible to mitigate for human factors and it is possible to improve safety culture. A major US academic centre demonstrated that simple interventions such as assigning senior management directly to solve issues within individual units within the hospital, implement teamwork and communication tools, and learn from defects in same led to major improvements in SAQ score over a two year period.²² Senior management in our institution are practicing and caring for patients every day and it is possible the SAQ means reflect this.

The survey has identified positive attitudes to management and this is noteworthy in the context of our institution's clinical management approach. 70% of respondents agreed that management were doing a good job and 80% agree that they do not knowingly compromise patient safety. In contrast, the perceptions of frontline staff in the cited tertiary university hospital - which employs a non-clinical executive management model - were not positive, with only 30% and 40% agreeing with the above statements respectively. The overall response to the "perceptions of management" theme was consistently more positive than the benchmarked institutions. The authors see this as a positive effect of the "Mastership" model employed by our hospital.

Despite receiving mostly positive scores in the context of national and international benchmarks, "working conditions" provided the most negative response of all subgroup themes (Table 3). The most striking response was around levels of staffing in which only one-tenth of respondents agreed that the hospital was adequately staffed. This is mirrored in other applications of the survey¹⁸ and response to this item in our survey was more negative than the other benchmark studies. Staffing in public healthcare institutions is a common theme in contemporary society. One need only peruse recent media coverage of staffing issues and mortality rates in nursing homes during the CoVid-19 pandemic. It has been shown in a United Kingdom-wide cross-sectional study that higher nursing and physician staffing levels both independently reduce mortality in medical patients.²³ It follows

that while we as an institution should focus on influencing this as a way of improving PSC, it is also a likely requirement for most healthcare institutions.

Strengths of our study include a response rate of 79% which compares favourably with international benchmarks of between 65% and 72%. Analysis revealed acceptable internal consistency (Cronbach α : 0.59 – 0.83) within the subgroups of the survey. We describe the first use of this questionnaire in an obstetric setting in our country and it is amongst few other examples in the literature. This article adds to the evidence base and provides fertile ground for future research.

We do accept some limitations. It is impossible to compare the results of our survey definitively with those of the institutions cited in this article. Those institutions provide care in different specialities and experience other challenges. A theme shared however, is that creating a positive PSC is an effective and achievable way to improve outcomes for patients. Strategies such as those mentioned in our discussion can be adopted by other institutions to improve PSC. We also recognise that survey responses are subjective and while positive scores in the SAQ have been shown to correspond with good outcomes, it is accepted that correlation does not always imply causation.

The authors feel the time is ripe for a national assessment of PSC in our obstetric institutions. This will allow more robust comparisons of similar settings and identify differences and opportunities for improvement.

Declarations of Conflicts of Interest:

None declared.

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