Surgical Safety Checklist and Team Brief: Evaluating the Efficacy within the Operating Theatre Environment of a Large UK Teaching Hospital

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EXECUTIVE SUMMARY

In 2009, the World Health Organisation (WHO) issued a worldwide recommendation for the use of a ‘5 Steps for Safer Surgery’ approach (Patient Safety First) which led to mandatory introduction of the team brief and Surgical Safety Checklist within operating theatres (WHO, 2009 and NPSA, 2009). This intervention required a significant change in behaviours and culture for the safety benefits to be achieved and embedded. The research study is therefore centred on the impact of the implementation of the team brief and checklist within a large teaching hospital in the UK. The aims of the study was to evaluate the efficacy of these in improving team cohesion, safety culture and reducing adverse events, as well as the identification of whether operational and cultural barriers exist which impede best practice.

The literature review explored the international studies undertaken over the past decade and pertinent publications with regard to the implementation of the checklist and team brief in healthcare, which provided the theoretical framework and the formulation of several hypotheses to be applied through this research paper. Based on this premise and by applying a deductive approach, this empirical study explored and tested these hypotheses to understand whether they apply to the large UK teaching hospital by using both qualitative and quantitative research methodology to collate appropriate and in-depth data for analysis, interpretation and reporting.

Qualitative and quantitative methods were selected as the most appropriate means of measuring the perception of surgeons, anaesthetists, theatre personnel, quality and safety team members and the Medical Director with regard the efficacy of the team brief and checklist. In addition, data from the Hospital Incident Reporting system was analysed to determine if the implementation had influenced the reporting culture and reduced adverse incidents within the operating theatre. There was a lack of correlation between the findings of both research methods for certain hypotheses suggesting inconsistency in overall views of the multi-disciplinary team participating in the research study, but provided a platform for the researcher to suggest recommendations for improvements and directions for future research. The findings of the study also suggested that the introduction had positively impacted on communication, teamwork, empowerment, safety culture, incident reporting and reducing potentially adverse incidents and that the operational and cultural barriers which existed, such as the hierarchy and “generation gap” could be addressed.
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<td>HCA</td>
<td>Health Care Assistant</td>
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<td>Hospital Incident Reporting System</td>
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<td>HRO</td>
<td>High Reliability Organisations</td>
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1.1 Background

Surgery is an integral part of healthcare with over 234 million operations being performed annually worldwide (Academy Health, 2010), 9.748 million undertaken within the UK (NHS Confederation). Significant improvement in surgical interventions means that most people will undergo a surgical procedure in their lifetime and although surgical care could improve or save lives, technological advances and complexity leads to an increased risk to patients. A rate of 0.4-0.8% (1 million) deaths and 3.16% (7 million) complications leading to disability occur during surgery each year worldwide, 50% of which are avoidable (Gawande et al., 1999 and Kable et al., 2002). Surgical safety has therefore emerged as a significant global public health concern.

The US Institute of Medicine’s report, ‘To Err is Human’ (Kohn, et al 2000), claimed that 44,000-98,000 deaths in the USA were due to medical errors at a financial cost of $29 billion per year (Kohn et al. 2000). Further studies have shown that of the adverse events in healthcare, 50% relate to incidents occurring during surgery with half being preventable, such as wrong site surgery, retain swabs known as ‘Never Events’. Analysis of the incidents reported the root cause of 75% being poor communication and teamwork (Brennan et al., 1999; Gawande et al., 2003; Sutcliffe et al., 2004).

In response to the growing concern about patient safety and from a humanitarian and financial viewpoint, the Institute of Medicine in the US and the Department of Health in the UK acknowledged that healthcare organisations must adopt safety management techniques used in other industries, such as aviation. This acknowledgement led to the launch of the global Patient Safety Challenge in January 2007 (WHO, Background to safer surgery) aimed at improving safety in surgery around the world by defining a set of core standards.

1.2 The Evolution of the WHO Surgical Safety Checklist

As part of the Patient Safety Challenge, the Safe Surgery Saves Lives Study Group was established in January 2007, led by Dr Atul Gwande a leading Harvard surgeon and writer. The group consisted of an international team of experts in anaesthesia, surgery, nursing, human factors and quality to review literature to develop an intervention to significantly improve patient
safety within the operating theatre, applicable internationally. The team turned to aviation, a safety critical industry with exceptionally low failure rates (Hales, 2006 and Winters, 2009) where checklist methodology had been embedded into practice.

The project’s aim was to design a tool which supported clinical practice, enhanced teamwork and interdisciplinary communication without compromising professional judgement (Walker et al., 2012). This work led to the development of the WHO Surgical Safety Checklist (the checklist) and guidelines. The intention of the checklist was to provide surgical teams with a simple set of succinct items to be checked pre and post surgery to improve patient safety, reduce major surgical complications rates, as well as enhance teamwork and communication for every operation performed, whether elective or emergency (Hayes et al., 2009).

1.3 What is the WHO Surgical Safety Checklist?

The 19-point surgical checklist (figure 1) was designed to promote effective teamwork and prevent adverse incidents such as unnecessary blood loss, drug allergies and surgical ‘Never Events,’ for example wrong site surgery and retain swabs or instruments.

Figure 1. WHO Surgical Safety Checklist

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**Figure 1. WHO Surgical Safety Checklist**

This checklist contains the core content for England and Wales

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Source: [http://www.nrls.npsa.nhs.uk/resources/clinical-specialty/surgery/?entryid45=59860](http://www.nrls.npsa.nhs.uk/resources/clinical-specialty/surgery/?entryid45=59860)
The checklist design detailed good practice at three critical points during the patient’s journey through theatre. The first stage was ‘sign in’ which was to be undertaken before induction of anaesthesia in order to check patient identification, ensure appropriate consent given, confirm procedure and surgical site. The ‘time out’ stage was to occur immediately before incision and included a team introduction, reconfirmation of patient identification, team discussion on potential issues during surgery and adherence to the surgical site bundle (antibiotics, hair removal etc). The ‘sign out’ stage was to be undertaken before the patient left the operating theatre to ensure that the correct count of needles, swabs and instruments were confirmed and to discuss post-operative management or concerns.

In addition to the checklist, the WHO recommended two additional steps, the first being a team brief to be conducted prior to the arrival of the first patient in theatre. This process enabled the team to discuss all cases on the theatre list to ensure that any clinical needs, such as patient allergies, blood requirements, timing of antibiotics, equipment needs were identified and addressed. The WHO also recommended a de-brief being the final step in the process, a practice not fully implemented in most hospitals. A de-brief enabled the team to discuss what went well with the case and what could have been done differently to improve standards of care. Figure 2 below demonstrates the ‘5 Steps for safer surgery’ developed by Patient Safety First (2009).

**Figure 2. ‘5 Steps for Safer Surgery’**

![5 steps for safer surgery](image)

Source: Patient Safety First: Implementing the Surgical Safety Checklist: The journey so far

### 1.4 Evaluation and Endorsement of the WHO Surgical Safety Checklist

To assess the effectiveness of the checklist, a multinational study was undertaken in 2009 within eight hospitals (figure 3) from diverse economic setting across the world, St Mary’s Hospital in London being the UK pilot site. The results of the study identified that the use of the checklist improved compliance with standards of care by 65% and reduced mortality rate by
50% (Hayes et al., 2009 and Birkmeyer et al., 2010). This was further supported by Sax (2009) who reported that utilising the checklist in healthcare reduced risks, mortality and morbidity.

**Figure 3. WHO Surgical Safety Checklist Pilot Sites**

![Map showing WHO Surgical Safety Checklist Pilot Sites](http://www.who.int/patientsafety/safesurgery/pilot_sites/en/index.html)

The significant findings of Hayes et al. (2009) prospective longitudinal study were acknowledged worldwide and led to the global implementation of the WHO Surgical Safety Checklist, team briefs and de-briefs. The Department of Health, the Royal Colleges of Anaesthesia, Surgeons and Nursing and the National Patient Safety Agency supported these findings and endorsed the checklist. A National Patient Safety Alert (NPSA, 2009) was issued in January 2009 requiring all NHS organisations in England and Wales to implement the checklist for all patients undergoing a surgical procedure.

### 1.5 Challenges of Implementing Team Brief and the Checklist

The implementation of team briefings and checklist required a significant change in the way surgeons, anaesthetists and theatre personnel practiced for increased standards of care within the operating theatre environment to be achieved. Moreover, it required a fundamental change in culture to remove the historic hierarchical boundaries to achieve improved interdisciplinary communication and teamwork.

### 1.6 The Research Approach

A review of international literature relating to the implementation of the checklist and team briefing in healthcare provided a theoretical framework to be applied through this research.
paper. The theoretical framework formulated several hypotheses in relation to introduction of the checklist and team brief which include improvements in teamwork, communication, safety culture, as well as a reduction in adverse incidents and avoidable harm. Furthermore, the study was designed to explore whether cultural and operational barriers exist which impede the efficacy of the checklist and team brief. Based on this premise and by applying a deductive approach, this empirical study explored and tested these hypotheses further to understand whether these apply to a large teaching hospital in the UK.

To the researcher’s knowledge, no study of this nature has been done locally which intends to find answers to the proceeding questions and provide recommendations for improvements. This empirical study discusses the WHO Surgical Safety Checklist (the checklist) and team brief both conceptually and in practice, giving examples of international studies where these have been successfully and un成功地 embedded into clinical practice and discusses linkages to the origins of the checklist within other safety critical industries, such as aviation.

To set out the parameters of this study, the main research question was to evaluate how effective the checklist and team brief had been in improving team cohesion, culture and safety with the following sub-questions:

i) Whether the implementation of the team brief and checklist had improved communication and teamwork within the operating theatre;

ii) Whether cultural and operational barriers existed within the acute operating theatres which influence best practice;

iii) The perceived impact of the team brief and checklist on reducing adverse incidents and post operative infections;

iv) Whether the implementation had impacted on reportable incidents within the operating theatre environment.

In contrast to the submitted Research Proposal, the researcher has extended the study to incorporate an evaluation of the team brief due the impact this had on communication and team work, as identified during the research process.

A review of the existing literature showed ongoing debate in medical journals (Waehle, 2012) and international studies (Hayes et al. 2009, Takala et al. 2011, Fourcade et al. 2012) as to
whether this safety methodology, which originated from the aviation industry had improved patient safety, team cohesion, communication and a breakdown of the pervasive hierarchy within operating theatres.

Quantitative and qualitative research techniques were applied to obtain the research data, through self-completed questionnaire and semi-structured interviews. In addition, data was collated from the Hospital Incident Reporting system to ascertain whether the implementation had influenced that reporting culture and led to a reduction in surgical ‘Never Events’. The findings of these are presented in the following chapters with detailed analyses of the perceptions of the respondents in relation to efficacy of the team brief and checklist. The primary and secondary research questions were further elucidated by appropriate critical analyses of research findings.

1.7 Conclusion

This study attempts to consolidate the knowledge base on the impact of team brief and checklist on patient safety and team cohesion in the operating theatre. It provides further evidence on the efficacy of the implementation of these safety strategies within a large UK teaching hospital, identifying areas where benefit is clear and where future resources may be directed.
CHAPTER 2 - LITERATURE REVIEW

2.1 Introduction

This chapter provides a critical overview of the relevant international literature over the past decade and some analysis of the findings. The plethora of studies have identified several key themes that are fundamental in ensuring the checklist is used safely and appropriately, these being a change in culture to improve teamwork and communication and links to the aviation industry (Lingard et al., 2005 and Sax, 2009). Further studies have focused on whether organisational and cultural barriers exist which impede best practice (Vats et al., 2010) and whether the checklist and team brief implementation had led to an empowered workforce. With a focus on Hayes et al. (2009) findings, several studies have explored whether this methodology had led to a reduction in adverse events and avoidable harm within their operating theatres (Sax et al. 2009, Birkmeyer, et al. 2010, Fudickar et al. 2012).

2.2 Background

The WHO Safer Surgery Saves Lives checklist was created by the multi-national medical professional research group with an intention of improving patient safety through enhanced inter-disciplinary teamwork and communication within the operating theatres. The global interest in the findings of the large international study (Hayes et al., 2009) led to the worldwide implementation of the WHO Surgical Safety Checklist in 2009. Since then there has been ongoing debate in medical journals (Waehle, 2012) and international studies (Hayes et al. 2009; Takala et al. 2011; Fourcade et al. 2012) with regard to the accuracy of these finding and whether a simple five step process, using a team brief and checklist and de-brief could lead to improvement in patient safety and team cohesion within operating theatres.

Accordingly to the findings of Weiser et al.’s (2010) prospective longitudinal, creating a safety culture cannot merely be achieved through the implementation of a checklist without the promotion of effective teamwork and communication. Furthermore, Fudickar et al.’s (2012) review of 20 studies concerning the effect of the checklist identified the requirement for surgeons, anaesthetists and theatre nurses to recognise the value of the checklist in flattening hierarchy, improving communication, building effective teamwork and safety culture and not view it as a sole means of just checking off items.
2.3 Learning from aviation

Organisations that perform complex and hazardous operations with exceptionally low failure rates are often referred to as high reliable organisations (HROs) in medical literature (Hales et al., 2006 and Winters et al. 2009). This term was often applied to the aviation industry where checklists have been embedded into practice for decades as a cognitive aid to address human error and improve safety by freeing up mental capacity (Winters et al., 2009 and Thomassen et al., 2011).

Additionally, the aviation industry identified that this technical solution alone could not improve safety and that the combination of effective non-technical skills, such as team work and communication could also contribute significantly (Patient Safety First, 2009). This conclusion was reached following the investigation into the aviation disaster in 1977 when two aeroplanes collided on the runway in Tenerife, killing 583 people. The findings of the investigation alerted the aviation industry of significant hierarchical issues within the cockpit, resulting in communication failures amongst crew members. It was declared that the root cause of the disaster was miscommunication between the Captain and the First Officer who felt too intimidated to correct the Captain that the runway was not clear for take-off (O'Reilly, 2010). According to Makary, Holzmueller et al. (2006), similar intimidation and lack of approachability are prevalent in healthcare.

Within aviation these findings led to the introduction of crew resource management techniques which enabled collaborative decision making and empowerment of junior crew members to raise any potential issues. A prospective study by Sax et al. (2009:1133) similarly identifies a positive effect on ‘personal behaviours and empowerment within healthcare following the implementation of crew resource management training’ in conjunction with the checklist and team brief methodology. Conversely, the study stated that unlike aviation, it would take years to embed this approach into the hierarchical culture of healthcare, particularly within the operating theatre.

The early work of Lingard et al. (2005) piloting a preoperative team checklist which has been deep-rooted in aviation research, identified a positive relationship between the checklist and the promotion of team coordination, information exchange and improving safety. According to Thomas et al. (2000) and Wanzel et al. (2000), learning from other high risk industries was
essential for the complex and high risk environment of operating theatre, where there was potential for complications and adverse events to occur during a surgical procedure, however not all of the surgical profession believed this to be an appropriate comparison (Sax, Bagian; cited in O'Reilly, 2010).

Dr Sax, Professor of Surgery, argued that there are significant dissimilarities between healthcare and aviation and stated that people were not airplanes, which as machines “they tend to act the same way every time,” hence why checklists are an essential tool for pilots, particularly in times of crisis. He further stated that patients are more complex than aeroplanes and there are more emotions involved if a death was the direct result of an avoidable error (O’Reilly, 2010).

Heltne et al, 2011, argued that there are similarities however that could be addressed by the checklist and team brief methodology that being the empowerment of all disciplines of staff to raise concerns and have direct communication as a team approach. Like the Captain, the Surgeon was seen as the lead in their respective environment, making clear decisions on what and when actions should be taken by the multi-disciplinary team, who should not feel intimidated. Effective teamwork, communication and shared learning are all key components of HROs, where everyone was accountable for identifying failure, the importance of which is becoming increasingly recognised in the heath care setting worldwide.

2.4 Importance of communication

According to Leonard et al. (2004), communication failures are the leading cause for adverse events within the operating theatre environment. The findings of the Joint Commission on Accreditation of Healthcare analysis of 2,455 sentinel events supported this claim and reported that the root cause of 75% of surgical events were due to communication errors (Leonard et al. 2004). This was further supported by the growing evidence that reported a reduction in patient mortality rates if communication and coordination of roles were effective within operating theatres (Young et al. 1997; Lingard et al. 2004; Lingard et al. 2008). Conversely, Rayner (2009) argued that patient safety cannot be solely dependent on what was communicated, but on the quality and how much was communicated. The structured set of questions on the checklist ensured that nothing was overlooked in terms of providing appropriate standards of
Bagian et al.'s review (2010), identified fundamental differences between members of different professionals, where surgeons and nurses rated teamwork and communication with their peers higher than with each other and recommend that this be taken into consideration when implementing the team brief and checklist. Similarly, Makary et al.’s (2006) study stated that senior medical professionals often perceive that they had good communication skills, which led to improved teamwork but the findings identified that although 85% of surgeons ranked communication skills of their colleagues as high, only 48% of nurses agreed that surgical communication was good. Makary et al. (2006) further reported that nurses described good collaboration as having their input respected, whereas surgeons describe it as nurses anticipating their needs and following instruction.

A similar theme was identified in study undertaken by Mills et al. in 2008 and Carney et al. 2010, which piloted the Medical Team Training questionnaire across inter-disciplinary groups. The finding from Mills’ et al. study undertaken across 6 centres as part of the medical team training pilot project identified inconsistency between surgeons and nurses in that “surgeons perceived a stronger organisational culture of safety, better communication and teamwork than that of the nurses or anaesthetists” (Mills et al. 2008:107) This misjudged awareness of poor communication skills between the surgeons and nurses could therefore hinder information exchange and the effectiveness of the team brief and the checklist. It was therefore recommended that as part of the checklist implementation, healthcare organisations anticipated these inconsistencies and different perceptions amongst healthcare professionals and put mechanisms in place to overcome these to enable improved communication and teamwork to be achieved.

An earlier observational study by Lingard et al. (2004) found that communication failures within operating theatres resulted in over 60% of surgical adverse events and advocated that the introduction of team brief and checklist methodology would ‘achieve explicit and shared goals’ and mitigate risks to patients. The result of these communication errors led to inefficiency, tensions, wasted resources and delays. This was further evidenced in a later longitudinal, quantitative prospective study using a pre-intervention and post-intervention design by Lingard et al. (2008:12) which reported a significant reduction in communication failures following the
implementation of “inter-professional checklist briefings” and “proactive and collaborative team communication.” Nundy et al. (2008) also argued that the findings from their pre-post study on team briefings reported reduced theatre delays by 31% and adverse events.

Furthermore, two studies conducted by Makary et al. (2006 and 2007) also found that team briefings prior to commencement of the list improved team motivation, coordination, discipline and patient outcome, which was supported by Allard et al.’s (2011) more recent longitudinal study involving 597 multi-disciplinary theatre staff. Furthermore, the findings suggested an improvements in safety culture by 7%, as qualified by the Safety Attitude Questionnaire (SAQ) conducted. Although this was a relatively small increase, it showed that the methodology had achieved a positive and shift away from the historic hierarchical culture, which according to Sax et al. (2009) would take years to change.

2.5 Importance of team work in operating theatres

The delivery of healthcare is an inherently multi-disciplinary, task orientated and dependent on effective interactions of individuals from highly diverse backgrounds (Rosen et al., 2008). Leonard et al. (2004) acknowledged that although individuals working within theatre have received training in their respective disciplines, there had been limited formalised training on how to function well as a team and Makary, Sexton et al. (2006:631) further argued that “teamwork training initiatives have not effected long-term attitudinal or behavioural changes,” which is fundamental for the successful implementation on the team brief and checklist methodology.

It had been recognised in patient safety literature that team performance is crucial for the delivery of safe patient care and that this could not be achieved solely by the introduction of a checklist (Kohn, 1999). Watson (2009) supports this claim and argued that teamwork had become a focus of system-based interventions to improve patient safety and clinical standards by enhancing the quality of patient care. As stated by Atul Gawande, author of The Checklist Manifesto (2010):

"a surgical intervention is a team effort. The most critical resources for improving surgical quality and safety in the operating room are the team members: the surgeons, anaesthesia professionals, nurses, clinical technicians, and others who all add their
specific expertise to ensure patients are not harmed. A team that works effectively together to engage their knowledge and abilities on behalf of a patient can avert a considerable proportion of life-threatening complications” (Gawande, cited in Woodhead, 2008).

A team is defined as two or more individuals with a comprehensive set of skills required to work in together to achieve specific shared goals, communicate, coordinate and adapt to change as required. The effective use of the checklist involves a multi-team approach moving through a logical sequence of steps to ensure the safe and uneventful transit of a patient through the operating theatre. The WHO (2009) and Sparkes et al. (2010) both argue that teamwork was central in ensuring that systems involving multiple professionals are effective in minimising surgical risks. Sax (2009) also supports this, stating that the introduction of a checklist had for the first time enabled the multidisciplinary team to agree on a standard of patient care. Conversely, Russell (2008) suggested the adoption of a team approach to patient care within the operating theatre would face significant challenge due to the inherent and traditional hierarchical consultant surgeon-led environment.

El-Bardissi et al.’s (2012) literature review supported the use of the checklist in developing effective teamwork and communication, which they stated were crucial drivers for improving safety and quality of care within highly complex industries. Weigmann et al. (2007:24) observational study identified that poor teamwork accounted for 45% of surgical errors during cardiovascular surgery. The teamwork issues related to “miscommunication, lack of coordination, failures in monitoring and lack of team familiarity,” which was further supported by O’Connor et al. (2013). Furthermore, Bickell et al. (2006) argued that frequent change in theatre teams heightened the risk of human errors and added more pressure to the operating surgeon who was unfamiliar with the competences and knowledge of the team; a situation which could be overcome by the introduction of the team brief and checklist.

2.6 Cultural Barriers

Evidence suggested continual resistance from medical professionals, but argued that patient safety could not solely be enhanced by the introduction of a team brief and checklist. The whole anaesthetic and surgical team need to be engaged throughout the entire patient pathway
through an operating theatre for benefits to be realised (Vats et al., 2010; Waehle, 2012; de Vries et al., 2009; Nilsson et al., 2009).

According to Borchand et al. (2012), the introduction of team briefings and utilisation of a checklist required significant changes in the way surgeons, anaesthetists and theatre staff practice and a change in culture. The cultural change being linked to the delegation of responsibility for patient safety to the whole surgical team as opposed to a purely hierarchical surgeon led system. This shift in culture should lead to improved communication, improvement in teamwork and job satisfaction of the healthcare professionals. Ramsden (2007) suggested that clinicians need to be at the centre of driving transformation and cultural change to improve patient safety within the NHS, but in order for this to be achieved they have to acknowledge the benefits of the change and recognise that they are central to making it happen, which was further supported by Waehle, 2012; de Vries et al. 2009; Nilsson et al., 2009; Lingard et al. 2005.

The findings of Hayes et al. (2009:102) using pre and post intervention staff attitude questionnaires (SAQ) across eight hospitals suggested that the introduction of the checklist led to improved safety culture and that clinicians embraced the checklist, with “the overwhelming majority wanting it used if they were undergoing surgery”. Conversely, studies undertaken by Nilsson et al. (2010) and Helmio et al. (2011) utilising longitudinal questionnaires to assess the perception of the checklist one year post implementation, found that the implementation had not positively influenced the safety culture within the operating theatre, however this was not universal across all hospitals studied. Furthermore, Haugen et al.’s (2013:807) study in Norway using a prospective controlled intervention survey also reported “limited impact on safety culture” following the implementation of the checklist.

In a grounded theory study undertaken by Waehle et al. (2012:16) which explored the challenges of performing the checklist by the theatre nurses, significant cultural issues were identified in terms of how the nurses obtained “professional and social acceptance within the team”. Furthermore, the study identified considerable resistance from the surgeons who either expressed this verbally to the theatre nurses or “non-verbally in a more ignorant manner” (2012:19) The nurses managed this pessimism by becoming “invisible” (2012:20), which completely conflicts with what the team brief and checklist was meant to achieve in terms of empowering the whole team. The study also identified that the lack of administration guidelines
and limited time had a deleterious effect on the appropriate use of the checklist, but provided no conclusion of how these issues could be addressed.

Conversely, within the UK the checklist list was supported by theatre nurses and anaesthetists but was met with resistance and scepticism by surgeons. It identified a requirement to change the work culture within the operating theatre to achieve transparent, quality and teamwork improvements following its implementation (Vat et al., 2010). Although Vats et al. (2010), suggested areas of resistance and a lack of compliance from clinicians, it failed to identify or address the reasons for this. Due to the limitation of the study, it was unable to fully understand and identify the barriers which was a clear failing of the study and resulted in a significant amount of data collection and analysis being inconclusive and prevented appropriate recommendations to be suggested.

Conversely, Fourcade et al.’s (2012:191) research study across 18 cancer centres in France recognised that ‘organisational factors’ and ‘socio-cultural patterns’ influenced the successful implementation of the checklist and stated that representatives from the French Society of Anaesthesia declared that the “bureaucratic use of a checklist was of no benefit and might even have a negative impact” if organisational factors were not taken into account (2012:191). The three methodologies used in this study: interviews; questionnaire; and observational study, enabled the researchers to identify eleven barriers and the two main reasons why the checklist had not been effectively adopted. The first reason being “work organisation” (2012:196) and the need to align current systems and processes with the checklist to avoid duplication. The second reason was the relationship of professionals within the operating theatre environment, “cultural habits in clinical practice” and “deep rooted time-honoured hierarchy” (2012:196) that impeded effective communication. Despite the limitations of the study, in that the checklist was mandated resulting in high motivation of checklist use and the presence of the research during observational audits (the ‘Hawthorne’ effect), the identification of the barriers and reasons for these enabled the organisation to develop a change strategy to address issues such as, insufficient training to improve compliance and patient safety.

In addition, the study reported that one of the eighteen centres adopted change management principles prior to implementation and engaged with clinicians and theatres teams from the outset, which supports Parand et al.’s (2012) concept that acknowledgement of surgeons priorities and concerns was paramount to enable effective change. Furthermore, following
conclusion of Fourcade et al.’s (2012) study, participants developed a formal assessment plan on the eleven barriers and introduced an annual questionnaire to assess the cultural maturity of each centre. It was clear from this study that the principle of involving participants to focus on how barriers could be overcome clearly enabled the effective implementation and use of the checklist within this organisation. Conversely, according to Hurlbert et al. (2009), providing clinicians with statistics that relate to their own hospital and practice was more influential than data or studies from other institutions. Hurlbert argued that to embed an effective team brief and checklist process, every clinician is required to take ownership of the culture change and acknowledge the concept and principles of these patient safety interventions.

According to Flin et al.’s (2006:113) systematic review of the literature surrounding safety climate in healthcare, measuring the safety climate in an organisation through questionnaires “helps to diagnose the underlying safety culture of an organisation” as the historic culture could influence behaviours towards safety and outcomes for patients and theatre personnel. Evidence also suggested that the adoption of training tools, such as the SBAR system (System, Background, Assessment, Recommendation) provided clinicians with a standardised communication tool, creating an environment where everyone in the team could feel empowered to speak up and express their concerns and alert the team of safety issues through a shared common “critical language” (Leonard et al. 2004:i85). Furthermore, the growing interest in human factor and situational awareness training to support a cultural change and embed the principles of the team brief and checklist should also be acknowledged.

Conversely, however as argued by a number of studies the varying attitudes towards the acceptance of the team brief and checklist need to be addressed as this alone would influence the efficacy and compliance across operating theatre teams (de Vries et al. 2009; Nilsson et al., 2009; Lingard et al. 2005).

2.7 Operational barriers

In terms of operational barriers, a study using the planned behaviour theory as a framework where 14 semi-structured interviews were conducted with theatre staff to assess the level of compliance and attitude towards the checklist (O'Connor et al., 2013), identified that nurses were more sensitive to operational barriers and poor teamwork than surgeons or anaesthetists, which was also noted in Makary et al.’s study in 2006. These barriers included insufficient time
to carry out the checklist, the requirements for signatures, which are difficult to obtain when a surgeon is scrubbed and limited assertiveness of staff due to the previously discussed historic hierarchy. In addition, timing of the checklist was also identified as a barrier particularly for the anaesthetists who claim that the team brief was conducted at a time of high workload when drugs were being prepared for the operation, a finding also supported by Vats et al. (2010) and O’Connor et al. (2013).

A further qualitative and quantitative study by O’Connor et al.’s (2012:6) using semi-structured interviews and self-completed questionnaires suggested that organisations should review the checklist pre and post implementation to ensure appropriateness within specialities. In addition, the requirements for appropriate signatures at all three stages should be considered as they argue that “the requirement signature could be used as a ‘carrot’ to improve compliance”.

2.8 Impact on mortality, morbidity, adverse incidents and post-operative infections

Since the global acceptance of the finding from the international study (Hayes et al., 2009), which reported a 50% reduction in surgical morbidity and mortality following the implementation of the checklist, there have been further published studies examining this assumption. The systematic review of safety checklists in use by the medical profession undertaken by Ko et al. (2011) stated that the findings of Hayes et al.’s international pilot study failed to present those healthcare organisations with a good performance baseline showed little improvements in mortality and morbidity rates following the implementation.

Conversely, the findings of a study undertaken by Bliss et al. (2012) in the US which measured thirty-day patient outcomes following the implementation of the checklist suggests a significant reduction in 30-day morbidity. The findings also acknowledged the value of a structured team training session prior to implementation to orientate the multi-disciplinary team in the appropriate use of the checklist to achieve these reported improvements. Furthermore, a retrospective study undertaken by Panesar et al. (2011) with regard to wrong side-errors (incorrect marking or wrong site surgery) in Orthopaedics stated that the checklist could have prevented 21.1% (28/133) patient safety events had it been in use.

Within the UK, the sentinel events of healthcare organisations reported by the Joint Commission in the UK (Appendix B) suggested a significant reduction in adverse incidents within the
operating theatre, however as the data was voluntary and only represents a small proportion of actual events, no conclusion could be drawn from this data with regard to periodic trends or frequency of events. Moreover, Panesar et al.’s retrospective study (2011) reported that if in place, the checklist could have prevented 21.1% (28/133) wrong side-errors (incorrect marking or wrong site surgery). Conversely, Shojania et al. (2013) argued that trends in adverse events are not improving due to the limited effective patient safety interventions, stating that strategies such as the checklist are not universally adopted or effectively used. It criticises the poor implementation and lack of financial investment in safety interventions such as the WHO checklist.

2.9 Conclusion

The peri-operative team brief and checklist was designed to change the culture within operating room and open up lines of communication to breakdown the historic hierarchy and empower all team members to voice concerns before an error occurs (Borchand et al., 2012). The majority of these studies have demonstrated that the checklist and team briefing methodology have established an environment of mutual respect, improved communication and empowerment of staff and safety culture within the operating theatre (Nundy et al., 2008; Lingard et al., 2008; Allard et al., 2011), however some report no significant change in safety culture (Nilsson et al. 2010, Helmio et al. 2011) and state that clinician ownership was pivotal for effective change (de Vries et al., 2009, Waehle et al., 2012).

As discussed, effective communication and teamwork are essential to ensure patient safety in the operating theatre which, according to Sydor et al. (2012), could be threatened if status asymmetry between team members was not addressed. Manser’s (2009) review of teamwork literature highlighted a shift in focus from the importance of teamwork to team training being more significant which supports the evidence which suggested that a combined training approach helps to foster a team approach within the theatre environment and breaks down hierarchy, allowing nurses and other theatre practitioners to voice their concerns when an error is or has occurred (Hurlbert et al., 2009, Bliss et al. 2012). Vijayasekard et al. (2009:261) argued that implementing the checklist without appropriate training could lead to ‘checklist fatigue’ and the patient safety tool being viewed as a tick box exercise. Moreover, Weiser et al. (2010) argued that creating a safety culture cannot simply be achieved through the implementation of a checklist without the promotion of teamwork and communication. There
was a need for Surgeons, Anaesthetists and theatre nurses to recognise the value of the checklist in flattening hierarchy, improving communication, building effective teamwork and safety culture and not view it as a sole means of checking items (de Vries et al., 2009; Waehle et al. 2012; Fudickar et al. 2012).

Studies also suggested that organisations should fully acknowledge and address any operational barriers that could impede the implementation (Vats et al. 2010 and O’Connor et al. 2013) by engaging with theatre, anaesthetic and surgical teams. According to Bosk et al. (2009:444), if organisations assumed that a technical solution, such as the checklist would ‘solve adaptive (socio-culture) problems then it was likely that it would ‘suffer the same fate as guidelines and be left unused.’ Conley et al. (2011) supported this claim and reported that despite the global acceptance of the findings from the WHO Safer Surgery pilot study (Hayes et al., 2009) in reducing mortality and morbidity, achievement of this was dependent upon the effectiveness of each organisation’s implementation.

The following two chapters discuss the research approach and the finding of the analyses relating to these hypotheses in connection with a large teaching hospital in the UK. Firstly, the research would test whether the implementation of the team brief and checklist methodology had led to an improved multi-disciplinary communication and teamwork approach or whether the controversial statement of Russell (2008) with regard to the presence of a traditional and historic hierarchical environment existed and impeded best practice. Secondly, the research would identify whether operational and further cultural barriers existed (Vats et al. 2010) which impeded the efficacy of the checklist and enhancement of safety culture. Thirdly, using the internal hospital incident reporting system and the perceptions of individuals, the research attempts to identify whether the introduction of the team brief and checklist had led to a reduction in surgical ‘Never Events,’ avoidable adverse incidents and an improved safety culture within the operating theatre (Hayes et al., 2009; Bliss et al. 2012; Panesar et al., 2011).
CHAPTER 3 - DATA AND METHODS

3.1 Research approach

Qualitative and quantitative methods were selected as the most appropriate means of measuring the perception of surgeons, anaesthetists, theatre personnel, quality and safety team members and the Medical Director with regard the efficacy of the team brief and checklist on improving safety, teamwork and communication, as approached adopted by Fourcade et al. (2012) and O'Connor et al. (2013). In addition, data from the Hospital Incident Reporting system was acquired and analysed to determine if the implementation had influenced the reporting culture, as well as the impact on the occurrence of ‘Never Events’ within the operating theatres. A combination of quantitative and qualitative approach was applied to enable the statistically reliable information collated from the numerical measurements of the questionnaires to be enriched by the in-depth information obtained through the semi-structured interview process (Bryman and Bell, 2007:413). This pluralism approach, referred to as multi-strategy research by Bryman (2004) is strongly associated with objectivity (quantitative) and subjectivity (qualitative) and is supported by Bryman (2003:1) who argues that this provides the “best of both worlds.”

3.2 Methodology approach

3.2.1 Quantitative research

The quantitative primary data was obtained through self-completed questionnaires to enable the researcher to collect extensive simple, reliable and comparable data from Consultant Surgeons, Consultant Anaesthetists, junior doctors and theatre personnel working within the acute operating theatre suite of a large UK teaching hospital. The data measured the attitudes and perceptions of multi-disciplinary team with regard to the introduction of the checklist and impact on safety culture, teamwork and communication, levels of compliance as well as cultural and operational barriers.

3.2.2 Sample population of quantitative research

The NHS institution being studied had over 5,000 employees however in line with the focus of this research the sample population would be in relation to the operating theatres. The
organisation had four operating theatre suites with over 360 theatre personnel (scrub nurses, anaesthetic nurse practitioners and healthcare assistants). In addition there were 76 consultant surgeons and 95 consultant anaesthetists working across all four theatre suites. Due to time and resource constraints, the quantitative primary data was intended to be 50% of the target population based in one of the theatre suites. The acute theatre suite was selected as it housed the emergency (1), trauma (1) and elective theatres (5) and had a total of 200 surgical, anaesthetic and theatre team members. The sample size (n) therefore equated to n=100 employees (20 consultant surgeons and 30 consultant anaesthetists and 50 theatre staff), which the researcher considered representative of the entire theatre directorate.

The population contained a multi-disciplinary team from varying specialities and each member had an equal chance to participate in the study, which the researcher considered would eliminate any potential bias in the selection process and resultant bias in the data collected and findings (Carpenter, 1993).

3.2.3 The self completed questionnaire

The structured self-completed questionnaire was written in simple words, using language acknowledged by the participants in order to convey the meaning as clearly as possible to minimise unconscious bias (Zikmund, 2000). After the initial formation of the questionnaire, which consisted of thirty-four closed questions, a small pilot test was conducted with a selection of theatre personnel to ensure that the questions flowed, were “functioning well” (Bryman et al., 2007:273) and no problems were encountered with regard to clarity. Useful feedback was received, in particular with regard to duplication of three questions, two of which were removed and one remained as a measure for validity and reliability. In addition, the pilot group agreed with the 5-point Likert-scale and suggested that this allowed for those who were unsure to answer neutral (3) rather than leave the statement blank and potentially affecting the “validity or reliability of the responses” (Adelson and McCoach, 2010:797).

The final questionnaire (Appendix C) containing 32 closed questions for higher comparability (Bryman and Bell, 2007) was distributed by hand to the multi-disciplinary team working within the acute operating theatre over a four week period. A sealed container was made available for the completed anonymous questionnaires. One hundred questionnaires were distributed and
ninety-four questionnaires were completed (47 by medical profession and 47 by theatre personnel), a response rate of 94% and an over sample size by role of 63% (table 1).

Table 1. Questionnaire respondents

<table>
<thead>
<tr>
<th>Role</th>
<th>10+ years in post</th>
<th>5-10 years in post</th>
<th>2-5 years in post</th>
<th>1-2 years in post</th>
<th>&lt;1 year in post</th>
<th>Total Respondents/ Number in post*</th>
<th>% of sample size by role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consultant Surgeons</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>18/20</td>
<td>90%</td>
</tr>
<tr>
<td>Surgical Registrars</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>10/14</td>
<td>71%</td>
</tr>
<tr>
<td>Consultant Anaesthetist</td>
<td>10</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>17/30</td>
<td>57%</td>
</tr>
<tr>
<td>Trainee Anaesthetist</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2/10</td>
<td>20%</td>
</tr>
<tr>
<td>Scrub Nurse</td>
<td>9</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>18/30</td>
<td>60%</td>
</tr>
<tr>
<td>Anaesthetic Practitioner/Nurse</td>
<td>8</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>0</td>
<td>20/30</td>
<td>67%</td>
</tr>
<tr>
<td>Trainee Anaesthetic Practitioner</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>3/6</td>
<td>50%</td>
</tr>
<tr>
<td>Health Care Assistant</td>
<td>4</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>7/10</td>
<td>70%</td>
</tr>
<tr>
<td><strong>Total/Overall sample size</strong></td>
<td><strong>38</strong></td>
<td><strong>18</strong></td>
<td><strong>16</strong></td>
<td><strong>17</strong></td>
<td><strong>5</strong></td>
<td><strong>94/150</strong></td>
<td><strong>63%</strong></td>
</tr>
</tbody>
</table>

* 50% of the number of personnel working in the acute theatre suite

3.2.4 Data analysis of the quantitative data

The raw data from the completed questionnaires was recorded in MS Excel (2007) and transferred to SPSS 20 programme (IBM® SPSS® Statistics Version 20) for interpretation and analysis. Several quantitative analysis techniques were undertaken to “explore, present, describe and examine relationships and trends within the data collected” (Saunder et al., 2012:472). The researcher decided that the use of a boxplot graph, an approach used by Sydor et al (2010), would enable the overall distribution of answers by discipline and the identification of the median response to be presented for each question. As the data was discontinuous, a non-parametric test, Kruskal-Wallis was used to compare the distribution of answers by 1) professional staff group; 2) length of service. Statistical significance was set at the conventional $p=<0.05$ level.

Due to low numbers of responses from trainee anaesthetists (n=2), trainee Anaesthetic Practitioners (n=3) and health care assistants (n=7) these responses were grouped within a relevant profession to achieve appropriate analysis (table 2). Similarly, ‘years in post’ data was modified to combine ‘<1 year’ with ‘<1-2 years’ to give a <2 years group containing more than 10 subjects.
3.2.5 Qualitative research

The qualitative primary data were obtained through semi-structured face-to-face interviews with open-ended questions. The researcher acknowledged that face-to-face semi-structured interviews may add depth of meaning, rather than “breadth” (Blaxter et al. 1996:61) and understanding of the results from the quantitative research approach (questionnaires) also being conducted (Gillham 2000, Ritchie & Lewis 2003). Kvale’s (1996) seven stages of designing and implementing an interview study was also acknowledged to ensure that the researcher captured, analyzed, verified and reported the appropriate data in line with the objectives of the study.

A semi-structured interview template was developed in line with the findings from the literature review (Appendices D and E) to enable appropriate comparisons to be made. Each interview lasted approximately 50 minutes, was digitally recorded and transcribed verbatim and submitted to thematic analysis. Participants were selected randomly, with the exception to the Medical Director, Head of Safety and Quality and Safety and Quality Manager who were selected due their involvement with the team brief and checklist implementation. An email was sent to participants prior to the interview informing them of context and purpose of the research (Appendix F) and informed consent was also obtained from all participants (Appendix G).

3.2.6 Population of qualitative research

As the study used a pluralistic approach, the qualitative research focused on a smaller selection of multi-disciplinary personnel with experience utilising the checklist and team brief within the theatre environment and also those responsible for leading and implementing. The representative sample size was 12 (n=12). The number of professionals interviewed, in terms of their role and speciality/area of work is identified below (table 3), the median time working in

<table>
<thead>
<tr>
<th>Group</th>
<th>Revised Grouping</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trainee Anaesthetist</td>
<td>Anaesthetists</td>
</tr>
<tr>
<td>Trainee Anaesthetic</td>
<td>Anaesthetic Practitioner/ Nurse</td>
</tr>
<tr>
<td>Healthcare Assistant</td>
<td>Scrub Nurse/HCA</td>
</tr>
</tbody>
</table>

Table 2. Revised groupings
current practice was 8 years and the genders of the subjects were 58% men (7/12) and 42% women (5/12).

Table 3. Professions interviewed

<table>
<thead>
<tr>
<th>Profession Group/Code</th>
<th>Number (n=12)</th>
<th>Speciality/Area of work</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consultant Surgeon (S1, S2, S3)</td>
<td>3</td>
<td>General Surgery, Vascular Surgeon &amp; Orthopaedics</td>
</tr>
<tr>
<td>Consultant Anaesthetist (A1, A2, A3)</td>
<td>3</td>
<td>Anaesthetic Directorate, include a Speciality Lead</td>
</tr>
<tr>
<td>Scrub Nurse (SN1)</td>
<td>1</td>
<td>Operating Theatre Directorate</td>
</tr>
<tr>
<td>Anaesthetic Nurse Practitioner (ANP1)</td>
<td>1</td>
<td>Operating Theatre Directorate</td>
</tr>
<tr>
<td>HCA (HCA 1)</td>
<td>1</td>
<td>Operating Theatre Directorate</td>
</tr>
<tr>
<td>Medical Director (MD1)</td>
<td>1</td>
<td>Executive</td>
</tr>
<tr>
<td>Head of Safety and Quality (HSQ1)</td>
<td>1</td>
<td>Corporate</td>
</tr>
<tr>
<td>Safety and Quality Manager (SQM1)</td>
<td>1</td>
<td>Corporate</td>
</tr>
</tbody>
</table>

3.2.7 Data analysis of quantitative research

The researcher selected the thematic analysis method for analysing and reporting the data. Due to its flexibility, which is not depend on the guidelines of a specific theoretical framework (Braun and Clarke, 2008:78), this method enabled the researcher to identify, analyse and report categories and themes of the participants perceptions of the checklist and team brief in relation to the hypotheses identified through the literature review. Using a deductive approach, the transcriptions from each interview were thoroughly reviewed to enable a selection of words to be deployed as codes. The codes were then grouped into categories and themes in line with the identified hypotheses and recorded within a Microsoft Excel spreadsheet (MS Excel, 2007) to enable a thematic map and thematic analysis report to be developed. The results of the data analysis are presented in the subsequent section.
3.3 Hospital incident reports and ‘Never Events’ data

The Hospital Incident Reporting System was interrogated to collate the number of reportable safety hospital incidents within theatres for the period immediately prior to (2005-2011) and after (2011-2013) the introduction of the team brief and checklist.

3.4 Ethical considerations

The main ethical issue was confidentiality of the organisation and participants involved in the research. As stated by Patton (1990) the personal and conversational nature of interviews highlights several ethical issues which were considered and addressed by the researcher. All participants were assured of their anonymity during and after the study. As a researcher, the research project was conducted honestly and with integrity by obtaining informed consent from the organisation being studied and from all interview participants (Appendix G and H). Participation in both research methods was voluntary, as detailed in appendices F and I and all were assured that anonymity and confidentiality would be protected, as well as their right to withdraw from the research at any time without explanation. Furthermore, in line with information governance, all primary data was secured in a locked drawer and electronically stored within an encrypted folder only accessible to the researcher, which would be destroyed following completion of the dissertation.

The research study received full support of the Hospital’s Medical Director, Interim Chief Executive and Associate Director of Research and Innovation as it was considered to be a service evaluation research project. A supporting, confirmation email was sent to the University of Leicester prior to submission of the research proposal.
CHAPTER 4 - ANALYSIS AND RESULTS

4.1 Introduction

As described in the previous chapter, quantitative and qualitative methods were undertaken to obtain the perceptions of medical and theatre professionals. In addition, data from the Hospital Incident Reporting system was acquired and analysed to determine if the implementation had influenced the reporting culture, as well as the impact on the occurrence of ‘Never Events’ within the operating theatres. The results of these methods are reported individually, with reference to their relationship with other studies and concluded with synthesis of both research methods.

4.2 Quantitative analysis and results

The results from the questionnaire responses are presented by individual question using a boxplot showing the median (heavy line) the interquartile range (box) and overall data range (‘whiskers’). The x-axis represents the professional staff grouping and the y-axis the response score (1=strongly disagree; 2=disagree; 3=neutral; 4=agree; 5=strongly agree). Single data points with numbers are those identified by SPSS to be outliers. The overall table of case study median values (Appendix J) are presented in tabular form. Comparison between response distributions was made by the Kruskal-Wallis test, a non-parametric test of analysis of variance, using SPSS programme (IBM® SPSS® Statistics Version 20).

4.2.1 Impact on inter-disciplinary communication

When asked if the checklist had improved multi-disciplinary communication in theatre, 59% of respondents (55/94) agreed with the statement with the median response of 4 (agree) for all disciplines with the exception for the Anaesthetic Practitioner/Nurse responses which reported a median response of 3.00 (neutral) (figure 4). Statistical analysis using the Kruskal-Wallis test demonstrated no significant difference in responses attributable to professional groups.
Additionally, when asked if the checklist improved the transfer of information in theatres, 71% of respondents (67/94) agreed with this statement. The box plot (figure 5) reports an overall median of 4 (agree) for all professional groups. The Kruskal-Wallis test demonstrated no significant difference in responses attributable to professional groups.

When asked if the checklist had improved their knowledge of patient identity, medical history, medications, allergies and procedure to be undertaken, interestingly the boxplot (figure 6) reports an overall median response of 4 (agree) for all disciplines, with 65% of respondents (61/94) agreeing with this statement. Conversely the statistical analysis using the Kruskal-Wallis test demonstrated a significant difference in responses attributable to professional group (P=0.028). The scrub nurses/HCA demonstrated a unified response, all answering on the
neutral/positive end of the scale. This is in contrast with the other staff groupings where a more mixed perception was evident.

**Figure 6.** Boxplot of response to ‘the checklist had improved their knowledge of patient identity, medical history, medications, allergies and procedure to be undertaken’

4.2.2 Impact on teamwork

When asked if the checklist improves interdisciplinary teamwork, 69% (65/94) of respondents agreed with this statement, with an overall median response of 4 (agree) (figure 7). All professional groups reported a median of 4 (agree) with the exception of the Anaesthetic Practitioners/ Nurses who report a median of 3 (neutral). There was however no significant difference attributable to professional group as determined by the Kruskal-Wallis test.

**Figure 7.** Boxplot of response to ‘the checklist improves interdisciplinary teamwork.’
Moreover, when asked if the checklist had improved team co-operation, 57% of respondents (54/94) agreed with this statement. The overall median response was 4 (agree) with the exception of the Anaesthetic Practitioners/Nurses report a median of 3 (neutral) (figure 8). Statistical analysis using the Kruskal-Wallis test however demonstrated no significant difference in responses attributable to professional group.

**Figure 8. Boxplot of response to ‘the checklist had improved team co-operation’**

When asked if the checklist has improved the understanding of roles and responsibilities within the operating theatre, the overall median response was 3 (neutral) with the exception of Scrub Nurses/HCAs which report a median of 4 (agree) (figure 9). Forty three per cent (40/94) of respondents agreed with this statement. The Kruskal-Wallis test demonstrated no significant difference in responses attributable to professional group.

**Figure 9. Boxplot of response to ‘the checklist has improved the understanding of roles and responsibilities within the operating theatre’**
4.2.3 Cultural barriers

When asked if the checklist has removed hierarchical boundaries, interestingly only 17% of respondents (16/94) agreed with this statement with an overall median response of 3 (neutral). The median response was 3 (neutral) for three disciplines (Surgical Registrar, Anaesthetist and Scrub Nurse/HCA), but conversely the data for Consultant Surgeon and Anaesthetic Practitioner/Nurse reports an overall median response of 2 (disagree) (figure 10). No significant difference in responses attributable to professional groups however was identified by the Kruskal-Wallis test.

**Figure 10. Boxplot of response to ‘the checklist removes hierarchical boundaries’**

When asked if the checklist enabled them to express their own opinion relating to clinical situations, the overall median response was 3 (neutral) with only 48% agreeing with this statement. The boxplot (figure 11) reports an overall median response of 3 (neutral) with the exception of Anaesthetists and Scrub Nurse/HCA which reports 4 (agree). Statistical analysis using the Kruskal-Wallis test demonstrated no significant difference in responses attributable to professional groups.
Furthermore, when asked if the checklist process has improved their confidence and empowerment in theatre, interestingly only 24% respondents (23/94) agreed with this statement. The boxplot (figure 12) reports an overall median of 3 (neutral) with the exception of Consultant Surgeon which reports 2.5 (disagree/neutral). No significant difference between professional groups was identified by the Kruskal-Wallis test. With regard to the empowerment of theatre personnel which was a key driver for the implementation, the results suggest a marginal increase in confidence of scrub nurses but none for anaesthetic nurse practitioners.

**Figure 12.** Boxplot of response to ‘the checklist process has improved my confidence and empowerment in theatre’
When asked if they felt embarrassed or awkward during the introduction part of the checklist, only 11% of respondents (10/94) agreed with this statement showing that the majority were confident and not perturbed. The overall median response was 2 (disagree), with the exception of Surgical Registrar which reports a median response of 1 (strongly disagree) (figure 13). The Kruskal-Wallis test demonstrated no significant difference in responses attributable to professional groups.

**Figure 13.** Boxplot of response to ‘I feel embarrassed or awkward during the introduction part of the checklist’

![Boxplot](image)

4.2.4 Operational barriers

When asked if the checklist was easy to use, the median response for Consultant Surgeon, Surgical Registrar and Scrub Nurse/HCA was 4 (agree) (figure 14). Conversely the Anaesthetist and Anaesthetic Practitioner/Nurse median response was 3 (neutral). Overall the median response was 4 (agree) and statistical analysis using the Kruskal-Wallis test demonstrated no significant difference in responses attributable to professional groups. 53% of respondents (50/94) agreed with this statement.
When asked if they had designed the checklist would they have included similar items, 46% (43 out of 94) agreed with this statement. The overall median response was 3 (neutral) with no significant difference in responses attributable to professional groups using the Kruskal-Wallis test (figure 15).

Interestingly, when asked of the checklist was an unnecessary paper exercise, only 35% of respondents (33/94) agreed with this statement with an overall median response of 3 (neutral). The median response was 2 (disagree) across Surgical Registrar, Anaesthetist and Scrub Nurse/HCA (figure 16). Conversely Consultant Surgeon and Anaesthetic practitioner/Nurse
responded conservatively as the data reports a median response of 3 (neutral). Statistical analysis using the Kruskal-Wallis test demonstrated no significant difference in responses attributable to professional groups.

**Figure 16.** Boxplot of response to ‘The checklist is an unnecessary paper exercise’

Furthermore, when asked if the checklist is a safety tool enforced by management, the median was 4 (agree) for Consultant Surgeon, Surgical Registrar, Anaesthetist and Anaesthetic practitioner/ Nurse (figure 17). The Scrub Nurse/HCA data suggests a more conservative response with a median of 3 (neutral). The Kruskal-Wallis test demonstrated no significant difference in responses attributable to professional groups. Interestingly 55% of respondents agreed with this statement.

**Figure 17.** Boxplot of response to ‘The checklist is a safety tool enforced by management’
When asked if the checklist was time consuming, the overall median response was 4 (agree) (figure 18) with 54% of respondents (51/94) agreeing with this statement. Statistical analysis using the Kruskal-Wallis test demonstrated no significant difference in responses attributable to professional groups.

**Figure 18.** Boxplot of response to ‘The checklist is time consuming’

When asked if appropriate training was provided with regard to the effective use and completion of the checklist, the median response was 2.5 (disagree/neutral) with only 17% of respondents (16/94) agreeing with this statement. The median response across the medical profession was 2.50/3.00 (neutral), with theatre personnel reporting a median response of 2 (disagree) (figure 19). The Kruskal-Wallis test demonstrated no significant difference in responses attributable to professional groups.

**Figure 19.** Boxplot of response to ‘Appropriate training was provided with regard to the effective use and completion of the checklist’
When asked if a team approach to training would have been beneficial before the implementation of the checklist, interestingly 63% of respondents (59/94) agreed with this statement with a median response of 4 (agree). The Anaesthetist, Scrub Nurse/HCA and Anaesthetic Practitioner/Nurse median response was 4 (agree) compared to a median response of 3 (neutral) for Consultant Surgeons and Surgical Registrar respectively (figure 20). Statistical analysis using the Kruskal-Wallis test demonstrated a significant difference in responses attributable to professional group (P=0.000), which may be due to Consultant Surgeon and Surgical Registrar responding more negatively than the other groups.

**Figure 20.** Boxplot of response to ‘A team approach to training would have been beneficial before the implementation of the checklist’

### 4.2.5 Analysis of compliance and resistance

When asked if there was 100% compliance with the checklist across all elective theatres, 27% of respondents (25/94) agreed with this statement with a median response of 2 (disagree). The boxplot (figure 21) reports no consensus of opinion, showing a median response of 3 (neutral) and 4 (agree) for Consultant Surgeon and Surgical Registrar respectively. Conversely the Anaesthetist, Scrub Nurse/ HCA and Anaesthetic Practitioner/Nurse data reports a median response of 2 (disagree). This difference is confirmed statistically with the Kruskal-Wallis test demonstrating a significant difference in responses attributable to professional group (P=0.000). This result may be due to Anaesthetist, Scrub Nurse/ HCA and Anaesthetic Practitioner/Nurse responding more negatively than the Consultant Surgeon and Surgical Registrar group.
Figure 21. Boxplot of response to ‘There is 100% compliance with the checklist across all elective theatres’

When asked if there was 100% compliance with the checklist in the trauma theatre, 24 out of 94 (26%) respondents agreed with this statement with an overall median response of 2.5 (disagree/neutral). Eight subjects declined to answer as they presumably had no experience of working in the trauma theatre. The median response for Consultant Surgeon, Surgical Registrar and Anaesthetist of 3 (neutral), but in contrast, the Scrub Nurse/ HCA and Anaesthetic Practitioner/Nurse data reported a median response of 2 (disagree) (figure 22). This difference in opinion was statistically significant as confirmed by the Kruskal-Wallis test (P=0.024).

Figure 22. Boxplot of response to ‘There is 100% compliance with the checklist in the trauma theatre’
Furthermore, when asked if there is 100% compliance with the checklist in the emergency theatre, 34% of respondents (32/94) agreed with this statement, which is slightly more than the other theatre suites. The overall median response was 3 (neutral). There was no cohesive median response across the disciplines, however the median data (figure 23) suggests that the majority either responded conservatively, 3 (neutral) or 4 (agree), with the exception of the Anaesthetic Practitioner/Nurse data which reports a median response of 2 (disagree). Statistical analysis using the Kruskal-Wallis test demonstrated no significant difference in responses attributable to professional groups.

**Figure 23.** Boxplot of response to ‘There is 100% compliance with the checklist in the emergency theatre’

![Boxplot](image)

When asked if there was still resistance to complete the checklist, the overall median response was 4 (agree) with 65% of respondents agreeing with this statement. The median response was 4 (agree) for Anaesthetist, Scrub Nurse/HCA and Anaesthetic practitioner/Nurse. Interestingly, the Consultant Surgeon and Surgical Registrar potentially answered conservatively as their data reports a median response of 3 (neutral) (figure 24). This anomaly is confirmed by statistical analysis using the Kruskal-Wallis test which demonstrated a significant difference in responses attributable to professional group (P=0.000), potentially as a result of the Consultant Surgeon and Surgical Registrar groups responding more negatively than the other professional groups.
When asked if all the multi-disciplinary team were present during the ‘Team Brief’ there appeared to be a marked professional divide in opinion. The medical profession data (Consultant Surgeon, Surgical Registrar, and Anaesthetist) reports an overall median response of 4 (agree) (figure 25). In contrast the Anaesthetic Practitioner/Nurse data report a median of 3 (neutral), with the Scrub Nurse/HCA data reporting a median of 2 (disagree) with this statement (figure 30). This is reflected in the statistically analysis using Kruskal-Wallis test which demonstrated a significant difference in responses attributable to professional group (P=0.001). This result may be due to the Scrub Nurse/HCA and Anaesthetic Practitioner/Nurse responding more negatively than the medical professional groups. Forty six per cent of respondents (43/94) agreed with this statement.
When asked if the multi-disciplinary team were present during the ‘Time Out’ stage, interestingly comparable results were reported as above with the median response for Consultant Surgeon, Surgical Registrar and Anaesthetist group being 4 (agree) and in contrast, the Scrub Nurse/HCA and Anaesthetic Practitioner/Nurse data report a median of 2.5/3 (neutral) respectively (figure 26). Consistent with the previous question, the Kruskal-Wallis test demonstrated a significant difference in responses attributable to professional group (P=0.004) potentially as a result of the Scrub Nurse/HCA and Anaesthetic Practitioner/Nurse responding more negatively than the other medical professional groups. The overall median response was 3 (neutral) with 44% of respondents agreeing with this statement.
When asked if all the multi-disciplinary team were present during the ‘Sign Out’ stage, only 18% of respondents (17/94) agreed with this statement. The overall median response was 2 (disagree) (figure 27). The Kruskal-Wallis test demonstrated no significant difference in responses attributable to professional groups.

**Figure 27.** Boxplot of response to ‘All the multi-disciplinary team are present during the ‘Sign Out’ stage’

![Boxplot of response to 'All the multi-disciplinary team are present during the 'Sign Out' stage']

When asked if there is an effective ‘De-Brief’ carried out after each case, only 5% of respondents (5/94) agreed with this statement, the majority (63/94: 67%) disagreed. The boxplot (figure 28) reports an overall median response of 2 (disagree) across all disciplines. Statistical analysis using the Kruskal-Wallis test demonstrated no significant difference in responses attributable to professional groups.

**Figure 28.** Boxplot of response to ‘There is an effective ‘De-Brief’ carried out after each case’

![Boxplot of response to 'There is an effective 'De-Brief' carried out after each case']
4.2.6 Impact on safety, adverse incidents and post-operative infections

When asked if the checklist helps prevent potential adverse incidents and errors within the operating theatre, the overall median response was 3.5 (neutral/agree) with 47 out of 94 respondents (50%) agreeing with the statement. The boxplot (figure 29) reports the overall distribution of answers by each discipline. Statistical analysis using the Kruskal-Wallis test demonstrated a significant difference in responses attributable to professional group (P=0.003). This result may be due to Consultant Surgeons and Surgical Registrars responding more negatively than the other respondent groups.

**Figure 29.** Boxplot of response to ‘the checklist helps prevent potential adverse incidents and errors within the operating theatre’

Conversely, when asked if the checklist makes surgical care safer, the overall median response was 4 (agree) with 75 out of 94 (80%) of respondents agreeing with this statement (figure 30) and statistical analysis using the Kruskal-Wallis test demonstrated no significant difference in responses attributable to professional group.
Moreover, when asked if the checklist has had a positive impact on safety culture in theatres, the overall median was 4 (agree) with 65 out of 94 (70%) agreeing with the statement. The distribution of responses is shown in figure 31: the median response for all professional groups was 4 (agree) with the exception of the Anaesthetic practitioners/Nurses whose median response was 3 (neutral). Statistical analysis using the Kruskal-Wallis test demonstrated no significant difference in responses attributable to professional group.

**Figure 30.** Boxplot of response to ‘the checklist makes surgical care safer’

**Figure 31.** Boxplot of response to ‘the checklist has had a positive impact on safety culture in theatres’
When asked if the checklist is seen as an important patient safety tool by all of the multi-disciplinary team however, the overall median response was 3 (neutral) with only 39 out of 94 agreeing (41%). The distribution of responses (figure 32) tends to show no overall consensus of opinion; however, the Kruskal-Wallis test demonstrated no significant difference in responses attributable to professional group. This may be the result of wide ranging views within each group.

**Figure 32.** Boxplot of response to ‘the checklist is seen as an important patient safety tool by all of the multi-disciplinary team’

When asked if the checklist had identified reportable incidents such as no patient identification band, no signed consent form, patient not marked, 67% of respondents (63/94) agreed with this statement with an overall median response of 4 (agree). The distribution of responses is illustrated in figure 33 with the majority responding either 3 (neutral) or 4 (agree) with this statement. The statistical analysis using the Kruskal-Wallis test demonstrated a significant difference in responses attributable to professional group (P=0.000), perhaps suggesting that surgeons (consultants and trainees) had a more neutral perception compared to the rest of the theatre team.
When asked if the checklist reduced the incidence of post-operative infections and adverse incidents, the overall median response was 3 (neutral) (figure 34) with only 16% of respondents (15/94) agreeing with this statement. The Kruskal-Wallis test demonstrated no significant difference in responses attributable to professional groups.
When asked if they would want the checklist used if they were to undergo a surgical intervention or procedure, interestingly 80% (75/94) of respondents agreed with this statement. All groups with the exception to the Scrub Nurse/HCA reported a median response of 4 (agree) with one Anaesthetist not answering the question. The Scrub Nurse/HCA data reports a median response of 5 (strongly agree) and one respondent not answering the question. The data also suggests that Consultant Surgeon group answered more conservatively, 3 (neutral) or 4 (agree) than the other groups (figure 35). This apparent difference of opinion was confirmed statistically using the Kruskal – Wallis test (p=0.021).

**Figure 35.** Boxplot of response to ‘I would want the checklist to be used if I was having a surgical intervention or procedure’

4.2.7 Statistical analysis on number of years in service

Statistically analysis using the non-parametric Kruskal Wallis test was undertaken to identify whether there were any differences to respondents answers with regard to their number of years in service. Interestingly the analysis found no significant differences in relation to the number of years in post.
4.3 Qualitative results and analysis

A thematic analysis method was selected for analysing and reporting the data obtained through semi-structured face-to-face interviews relating to the efficacy of the team brief and checklist. This method enabled the researcher to identify, analyse and report categories and themes of the participants' perceptions in relation to the hypotheses identified through the literature review. The results of this analysis are presented in the thematic map below (figure 36) and a comprehensive thematic analysis report (Appendix K). An overview of the thematic analysis is reported below with the speeches of the subjects represented by the letters ‘MD’ for Medical Director, ‘HSQ’ for Head of Safety and Quality, ‘A’ for Anaesthetist, ‘S’ for Surgeon, ‘SN’ for Scrub Nurse, ‘ANP’ for Anaesthetic Nurse Practitioner and ‘HCA’ for HCA.

Figure 36. Thematic map
4.3.1 Impact on inter-disciplinary communication and teamwork

All participants acknowledged that the introduction of the checklist and team brief had improved team cohesion and increased their knowledge of patient and surgeon requirements, which they perceived had resulted in enhanced staff motivation, list planning and efficiency within operating theatres, consistent with the findings of Makary, Holzmueller et al. (2006). Statements made by participants identified that this was not evident prior to the implementation as stated below:-

“Before the introduction of the team brief and checklist we were lost, no communication – we would meet the surgeon but not the anaesthetist. We would not discuss what was required for every case. Now this happens and it is great for planning and knowing what we need for each case.” (HCA1)

“Before the implementation you didn’t have chance to question the surgeon as to what he/she might need. Now the team brief enables theatre lists to runs a lot better and smoother.” (HCA1)

In accordance with Borchand et al’s study (2012), the findings of this research also suggested that the implementation had improved accountability and safety within the operating theatre as a result of all staff understanding everyone’s name, role/ responsibility and competencies, leading to improved patient safety, as quoted below:-

“I think it is one of the benefits of the team brief, just to know everyone’s name and role. There is nearly always a student ODP or a junior anaesthetist that is new to the hospital or new to the system and not all the team know what they are capable of. So just saying at the beginning of the list that this is a medical student who has not been into theatre – so if something untoward does happen, we can utilise, allocate tasks appropriately leading to a quicker response rate” (A1).

Furthermore, ten participants acknowledged that the introduction had led to a “team approach” and all confirmed an increase in empowerment across the multi-disciplinary team, with supporting comments from theatre personnel stating they now “had a voice” (ANP1) and “their views were listened to and valued” (SN1), supporting the findings of Sax et al., 2009; Allard et al., 2011).
4.3.2 Existence of cultural barriers

All participants interviewed accepted the concept & principles of the checklist and team brief. Furthermore, all participants stated that they would want the checklist and team brief in place should they have a surgical procedure, two of whom had experience this as a patient and were appreciative of it.

Conversely, seven participants perceived there to be a “generation gap” within the surgical and anaesthetic teams and suggested that they fail to understand the principles and benefits of the checklist and team brief which they deemed as restricting their clinical practice, when in fact it enhanced it. This is supported by the following statements:

“I think there is partly a generational thing as they feel it restricts their clinical practice and I don’t think you can argue that at all with the checklist as you are not restricting clinical practice at all.” (A3)

“Anaesthetists of a certain generation are the ones that provide the most resistance. I think this is cultural.” (S1)

Conversely, the Surgeons or Anaesthetists interviewed considered that the checklist and team brief had “broken down hierarchical boundaries” (A3), however all three theatre personnel interviewed stated that this still existed within some surgical and anaesthetic teams, supporting the findings of Fourcade et al. (2012) and O’Connor et al. (2013).

4.3.3 Existence of operational barriers

Participants identified just four operational barriers with regard to the implementation of the checklist and team brief, these being: timing of the team brief; there being no specified time for the team brief; duplication and order/appropriateness of some questions on the checklist, which is partially comparable with by Vats’ et al (2010) and Fourcade’s et al. (2012) findings.

The timing of the team brief was acknowledged as an issue by all three Anaesthetists who stated that this was undertaken at their most demanding and time critical period when they were preparing medicines for the theatre session, as stated below:-

51
“There are some conflicts to our time and I think that the risk of the team brief element of it is that it happens in the anaesthetic room at a time when I am drawing up drugs – I have to force myself to stop what I am doing” (A1).

A further issue relating to timing was identified by all but one of the participants working within theatre, which was the lack of a specified time for the team brief to be conducted. This resulted in tensions between teams and unnecessary delays within the operating theatre and was inconsistent with the findings of Nundy et al. (2008) study which reported a reduction in delay post implementation.

Additionally, duplication of paperwork and order and amount of inappropriate questions on the checklist was also recognised as issues by the Surgeons and Anaesthetists which they stated elongated patient flow.

Furthermore, McCulloch et al. (2009) and Bliss et al (2012) suggested that communication and team-based training achieve significant benefits to techniques and patient outcome. The data results from this research however suggests that the lack of team-based communication and human factor training was a significant issue by ten of the twelve participants, who acknowledged that funding, surgical buy-in and time for appropriate training would be a significant barrier. This issue was further supported by the Medical Director and Head of Quality and Safety who advised that team-based training could be facilitated following the opening of a simulation suite.

From a cause and effect perceptive, the above barriers could potentially influence the acceptance and compliance amongst surgical and anaesthetic professionals.

4.3.4 Impact on safety, adverse incidents & post-operative infections

The introduction of the team brief and checklist in the operating theatre was seen an important step towards improving the safety culture (Sax et al., (2009), Allard et al., 2011; Borchand et al. 2012; Pancieri et al, 2013). Interestingly 100% of the participants confirmed that the introduction of the checklist and team brief had improved patient safety and enhanced the safety culture within the operating theatre environment. The significant benefits being that it enabled system
failures, such as missing equipment, patient identification band or signed consent form to be identified and addressed prior to the patient entering the operating theatre, a finding supported by Allard et al. (2011). This finding is further supported by the decrease in the number of ‘Never Events’ and incidents, but suggested that the increase* in HIRs over the past 18 months (table 4) indicates an improvement in the identification and resolution of patient safety issues following the implementation of the team brief and checklist and supports an improvement in the safety culture and reduction in avoidable harm.

Table 4. ‘Never Events’ and HIRS – 2005-2013

<table>
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<tr>
<th>Category</th>
<th>2005-2011</th>
<th>2011-2013 (18mths)</th>
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<tbody>
<tr>
<td></td>
<td>Number per annum</td>
<td>Average per annum</td>
</tr>
<tr>
<td>‘Never Events’</td>
<td>2</td>
<td>0.3</td>
</tr>
<tr>
<td>Lack or failure to consent</td>
<td>9</td>
<td>1.5</td>
</tr>
<tr>
<td>Lack of patient identification</td>
<td>32</td>
<td>5.3</td>
</tr>
<tr>
<td>Allergic Reaction</td>
<td>7</td>
<td>1.2</td>
</tr>
<tr>
<td>Lack of equipment/prosthesis</td>
<td>33</td>
<td>5.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>83</strong></td>
<td><strong>13.8</strong></td>
</tr>
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</table>

Furthermore, the perception of the participants was that the checklist and team brief had adverse incidents and ‘Never Events’ and provided “breathing space” (S1) to allow all the team to fully understand the case to be performed and was a “safety valve” (S3) to ensure all essential equipment and consumables were available prior to incision. This view was supported by Nillson (2010) where 93% of persons surveyed stated that the ‘time out’ stage increased patient safety.

Moreover, the Anaesthetists accepted that the checklist facilitated the identification of patient allergies and was also a valuable aid memoire with regard to the timing of antibiotics, which potentially resulted in the reduction of post operative infections. It was confirmed by all three Anaesthetists interviewed that the timeliness of antibiotics was an issue prior to the implementation, as stated below:-

“There have been lists when you have antibiotics drawn up but you have forgotten to give them, so this is good. I think the team brief has made me give the antibiotics appropriately and the checklist has ensured they are given at the right time.” (A3)
Conversely, two participants stated that safety benefits were only realised if there was “100% buy-in” (S1) and that a “cultural change was required for it to be successfully embedded into practice” (HQS1), which is consistent with the findings of de Vries et al., 2009 and Waehle et al., 2012.

4.4 Synthesis of the research data

There was a lack of correlation between the findings of both research methods for certain hypotheses suggesting inconsistency in overall views of the multi-disciplinary team participating in the research study. The findings however suggest that the introduction of the team brief and checklist had positively impacted on communication, teamwork, empowerment, safety culture, incident reporting and reducing potentially adverse incidents and the identification of operational and cultural barriers, such as checklist design and the perceived “generation gap” enable the organisation to put plans in place to address. Furthermore, the findings provide a platform for the research project to propose recommendations for improvements, as well as directions for future research in this field.

The subsequent chapter summarises the study’s key findings and explains what these mean within the theoretical framework and aims and objectives of this research paper.
As stated by Pancieri et al. (2013), the introduction of the checklist and team brief in the operating theatre is an important step towards improving patient safety and team cohesion which was the focus of this research study. The objective of this study was to identify whether the introduction of these interventions had impacted positively on communication, teamwork, culture and safety, and whether the existence of cultural and operational barriers influenced best practice with a large UK teaching hospital. Furthermore, the study explored the impact the interventions have had on reducing adverse incidents and post operative infections.

Consistent with other studies Fourcade et al. (2012) and O’Connor et al (2013), the qualitative and quantitative data revealed discrepant findings for certain hypotheses suggesting inconsistency in the overall views of the multi-disciplinary participants. The study however was able to identify the impact on these following the implementation of the team brief and checklist through the perceptions of the participants and analysis of the HIRS data.

There was concurrence between the findings of the quantitative and qualitative research data in relation to whether the implementation of the team brief and checklist had improved interdisciplinary communication and team work within the operating theatre, with the qualitative data being more assenting of these hypotheses; supporting the findings of Sax, 2009 and Allard, 2011. Furthermore, in accord with the findings of Lingard et al. (2008), analysis of the qualitative data revealed how the team brief, rather than the checklist had influenced a positive change in the behaviour of surgical and anaesthetic professionals, resulting in improved information exchange and staff motivation. In addition, there was a significant emphasis on improved efficiency and list planning as a result of staff being acquainted and better informed following the implementation, which was consistent with the findings of Makary, Holzmueller et al. (2006) and Borchard et al (2012). Furthermore, it was evident particularly from the findings of the qualitative research that staff introductions and acknowledgement of competencies prior to commencement of theatre lists had enhanced response times and therefore patient safety, during in the event of an untoward incident.
These positive findings should provide assurance to the organisation which, as stated by El-Bardissi et al., (2012) are crucial drivers for improving safety and quality of care within highly complex environments such as operating theatres.

With regard to whether cultural barriers exists that impede best practice, there was evidence to suggest the existence of hierarchical boundaries in both research methods, this being significantly evident from the perceptions of Surgeons and Anaesthetic Nurse Practitioners. Furthermore, the qualitative research method revealed a perceived “generation gap” and lack of acknowledgement of the principles and benefits of the checklist and team brief by some surgical and anaesthetic professionals who, according to Walker et al. (2012) may perceive the intervention as comprising their clinical judgement. Conversely, the statistically analysis using the non-parametric Kruskal Wallis test used to analyse the quantitative data reported no significant differences with regard to the number of years in post.

Interestingly, the impact on the empowerment of staff was only significantly evident in the qualitative data where all had reported positively, with participates stating that they now “had a voice” and “their views were listened to.” Conversely, the quantitative data reported that only 24% (23/94) of respondents agreed with this statement. This was a similar finding of Waehle (2012) and may be attributable to continual existence of the historic hierarchy, which as stated by Russell (2008) and Sax et al. (2009) is a significant challenge and could take years to change.

In relation to whether operational barriers exist that impede best practice, the quantitative data suggested that the checklist was time consuming and a tool enforced by management. In contrast, the findings of the qualitative data implied the main operational barriers were the timing of the team brief being a particularly challenge for Anaesthetists, no specified time for the team brief causing tensions and delays and duplication of paperwork/question and checklist design, which were similar to the findings of Vats et al. (2010).

According to Manser (2009), evidence suggest that the facilitation of combined training not only helps an organisation to foster a team approach, but also breaks down hierarchical boundaries. Unfortunately evidence from the qualitative and quantitative data suggested that there was insufficient team-based training provided by the organisation prior to the implementation and
that human factor and situational awareness training would have been beneficial, a significant oversight also identified by Fourcade et al’s study (2012).

Interestingly, the quantitative data with regard to compliance of the team brief and checklist suggested that although the surgeons and Anaesthetists reported positively in relation to all multi-disciplinary team being present at the team brief and ‘time out’ stage of the checklist, this was not consistent with the views of the theatre personnel who responded negatively. This marked difference of opinion between the professional groups may suggest potential unreliability of the responses making it difficult draw accurate conclusions.

In relation to whether individuals perceived the intervention to have impacted on reducing adverse events and post-operative infection, the findings of the quantitative data suggest that the majority of surgeons did not perceived there to be a positive impact on the prevention of potential adverse events and post-operative infections, which did not concur with the findings of Hayes et al. (2009), Weiser et al.’s (2010) Nilsson et al. (2010), Helnio et al. (2011) and Haugen et al (2013). Conversely, the finding of the qualitative data reported that all Surgeons and Anaesthetists interviewed perceived that the checklist and team brief had lead to a reduction in incidents and post-operative infections, with one Surgeon providing an example of when the checklist had prevented an incident occurring within his practice.

Furthermore, the data from the hospital incident reporting system suggested a positive change in patient safety with a decrease in ‘Never Events,’ lack of patient identification and an increase in identifying and reporting the lack of essential equipment, suggesting an enhanced safety culture, as supported by the findings of Allard et al. 2011; Nilsson et al. 2010.

In conclusion, despite evidence of continual resistance, the perceived “generation gap” and the existence of operational and cultural barriers, 80% of respondents to the questionnaire and 100% of participants interviewed stated that they would want the checklist and team brief in place if they were to undergo a surgical procedure, which is consistent with the findings of Hayes et al. (2009) and Allard (2011) and the majority of participants agreed that the implementation had made surgical care safer within the acute operating theatre of the large teaching hospital in the UK.
5.2 Theoretical implications

The research paper has added to the literature relating to the efficacy of the team brief and checklist and the impact on team cohesion, communication, patient safety, as well as provided confirmation that operational and cultural barriers still exist, in particular the perceived “generation gap.” Furthermore, the study demonstrated how using difference research methods lead to conflicting findings and also how a qualitative approach reveal a number of different dimensions not encompassed by quantitative methods.

5.3 Practical implications and recommendations

As the findings suggest, continual resistance and acceptance of the benefits of the ‘5 steps to patient safety’ intervention remain within the surgical and anaesthetic workforce. The organisation should therefore explore the facilitation of ‘crew resource management training’ in conjunction with the checklist and team brief methodology, as advocated by Sax et al. (2009), which would enhance the efficacy of these, as well as have a positive effect on personal behaviours and the empowerment of the multi-disciplinary team.

In addition, the findings also suggested that the multi-disciplinary team consider the checklist in its current form to be lengthy and contain unnecessary repetition, which could contribute to the continual resistance. The organisation should therefore consider the revision of the checklist through liaison with the multi-disciplinary team, which would enhance ‘buy-in’ and acceptance. Furthermore, the establishment of a specified time for the team brief to be conducted along with a uniformed pro-forma would further improve efficacy and patient safety.

The organisation should consider the launch of an awareness campaign to ensure the multi-disciplinary team were reminded of their accountability and responsibility with regard to team brief and checklist.

Finally, the establishment of a continual learning culture within the operating theatres through the introduction of a team de-brief should be explored, however as argued by Gururaja et al (2008), to enable de-briefs to be effectively conducted the organisation should acknowledge
that questioning and facilitation skills were essential and should therefore be integrated into the adopted training approach.

5.4 Limitations of the study

The study had several limitations which should be acknowledged which although have not invalidated the results, may have some impact on the overall findings. Firstly, as identified in Fourcade et al.’s study (2012), the mandated use of the WHO Surgical Safety Checklist by the Department of Health and also the researcher’s status within the organisation being studied could have influenced the way in which the respondents answered in both research methods, particularly in the qualitative setting. Secondly, although subjects were randomly selected to participate in the qualitative research method in the form of face-to-face interviews, the researcher met resistance when attempting to recruit medical professionals who were not supportive of the checklist and team brief methodology. The participants who therefore consented to contribute to the study were those who were either advocates or in a lead role within their speciality which could have influenced the data results. In addition, this potentially could have resulted in the spread of data between the two research methods for certain hypotheses. Thirdly, due to time constraints, the study was unable to provide evidence of improvements in the safety culture since the introduction of the team brief and checklist, other than the perceptions of the multi-disciplinary team and an overview of the hospital incident reports, an issue overcome by Hayes et al. (2009) and Allard et al. (2011) through the use of Staff Attitude Questionnaire.

Finally, the use of a ‘neutral’ rating within the questionnaire was accepted as the correct means to measure responses by the sample test population, the results suggest that this could have enabled employees to abstain and therefore not obtained the actual view of some participants with regard to the team brief and checklist in practice. The organisation may therefore wish to re-run the questionnaire within another theatre suite removing this option to establish the reliability of these results.
5.5 Direction for further research

As this study was limited to one theatre suite, the organisation should consider the distribution of the questionnaire and collation of responses from the remaining three theatres suites to compare results and following the implementation of the suggested recommendations above, the organisation should repeat this quantitative research method to audit whether the desired benefits have been realised across the theatre directorate.

In addition, as the study was unable to comprehensively confirm improvements to the safety culture within the operating theatre and identify where improvements could be made, the organisation should consider utilising a Staff Attitude Questionnaire to produce data which could be accurately measure and identify opportunities to further enhance patient safety across the theatre directorate and beyond (Makary et al., 2006, Hayes et al., 2009, and Allard et al., 2011).

A more detailed audit of reportable incidents and post-operative infection rates pre and post introduction of the team brief and checklist may provide more compelling evidence of their utility which, in turn could be a driver for change with the individuals who remain sceptical.

5.6 Reflections

The research paper has fulfilled the objectives it set out to achieve and provided the researcher with a valuable insight on how the team brief and checklist had influenced behaviours and safety cultures within the operating theatre. In addition, it identified improvements which could positively influence compliance and surgical and anaesthetic professionals understanding of the concept of these interventions. Furthermore, the researcher gained valuable knowledge into the divergence of data collated from qualitative and quantitative research methods and the importance and cautions of appropriate analysis, interpretation and reporting.

As anticipated, one major challenge experienced during the research process was to find willing participants for the face-to-face interviews and a convenient time for this to take place. In addition, the individual transcription of the twelve interviews was significantly time consuming and impacted to some degree on timescales, particular as one consultant could not be interviewed until the middle of July due to clinical commitments and annual leave. Access to an appropriate statistical software programme (SPSS) was also a challenge but once available,
made the analysis, interrogation and reporting of the quantitative data more comprehensive than the use of MS Excel. The use of such a system was a valuable exercise and has provided the researcher with a greater understanding of how data can be collated, analysed and reported in future research projects.

A further significant challenge was working to the agreed timetable to ensure completion of the dissertation around work and family commitments.

In conclusion, this dissertation has provided the researcher with extensive additional knowledge and skills on how interventions can impact on behavioural management and how to effectively conduct a research study using a variety of methods to collate, analyse, interpret data and using different formats to effectively present findings. All of these skills and the knowledge the researcher has acquired throughout the MBA course will not only benefit my team and organisation, but will be invaluable in my future career.
REFERENCES


Rayner J 2009 Reducing harm in perioperative care Nursing Times 105 (12) 32-33


MBA

RESEARCH PROPOSAL

By

ANDREA MYERSCOUGH

Student no: 089018103
Intake: February 2009
Date: April 2013
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<td>Triangulation with previous studies &amp; continual review</td>
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<td>Appendix Ai WHO Surgical Safety Checklist</td>
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<td>Appendix Bi Research Participants Information Sheet – Survey</td>
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<td>Appendix Ci Sample Letter to Research Interview Participants</td>
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1.0 DISSERTATION SUPERVISOR
My dissertation supervisor is Dr Warren Smith and we have communicated frequently through the Blackboard discussions forum and three telecom meetings.

2.0 TITLE
Surgical safety checklist: Evaluating its efficacy within an operating theatre environment of a large UK Hospital.

3.0 INTRODUCTION

3.1 Research Question and Sub-Questions
The focus of this research relates to the implementation of the World Health Organisation (WHO) surgical safety checklist within a large UK Teaching Hospital (National Patient Safety Agency, 2009, Appendix Ai). The study aims to evaluate how effective the checklist has been in improving team cohesion, culture and safety. The sub-questions aim to evaluation and identify: -

iii) Whether cultural and operational barriers exist within the acute operating theatres which influence best practice.
iv) Whether the checklist has improved communication, dynamics and teamwork within the operating theatre.
v) The perceived impact of the checklist on reducing adverse event and errors.

3.2 Why is this question interesting?
This question is of interest as since the global launch of the WHO surgical safety checklist across the healthcare industry from 2008, there has been ongoing debate in medical journals (Waehle, 2012) and international studies (Haynes et al. 2008, Haynes et al. 2009, Takala et al. 2011, Fourcade et al. 2012) as to whether the checklist methodology, which originated from the aviation industry has improved patient safety, team cohesion, communication and led to a breakdown of the pervasive hierarchy within
operating theatres. In my role as the Directorate Manager of Theatres I hope that the findings from this study will identify areas of improvement in embedding effective change.

4.0 RELATIONSHIP TO PREVIOUS WORK

Since the publication of the “To Err is Human: Building a Safer Health System” report (National Research Council, 1999) by the Institute of Medicine there has been an increased focus on improving patient safety, one of which is within the operating theatre. In 2009 a large international study was undertaken, supported by the WHO which reported that the use of a checklist reduced surgical morbidity and mortality by almost a half (Haynes et al. 2009, Birkmeyer, 2010). The findings of this study were acknowledged and led to the development and global implementation of the WHO surgical safety checklist. Furthermore, research by Lingard et al. (2004) identified that communication failures within an operating theatre resulted in over 60% of iatrogenesis, surgical adverse events and advocated the introduction of checklist methodology to ‘achieve explicit and shared goals’. The findings from a further study in the US identified a reduction in communication failures following the implementation of “inter-professional checklist briefings” and led to “proactive and collaborative team communication” (Lingard et al., 2008).

Similarly, the findings from 20 studies conducted by Fudickar et al. (2012) which analysed safety behaviour within the operating theatre in Germany and the effect of the surgical safety checklist identified an improvement of interdisciplinary communication. This was further supported by Takala et al. (2011) in a pilot study in Finland which identified an “increased awareness of patient-safety related issues, the procedure and expected risks” as well as an improvement in multi-disciplinary teamwork.

Conversely, a study undertaken across 18 cancer centres in France by Fourcade et al. (2012) identified eleven barriers to the staff adopting the checklist. The findings identified variable barriers and issues including administrative duplication, time constraints, ambiguity and lack of engagements surgeons/anaesthetists. One key finding was the professional relationship and cultural behaviour in clinical practice, in that staff practices remained entrenched in a “time-bounded hierarchy.” For the checklist to be effective, verbal communication between health professions needed to be ‘egalitarian.’
A study in Norway (Waehle, 2012) identified that the availability of time and the social and professional acceptance of the theatre nurses conducting the checklist by the surgeons and anaesthetists, was a significant concern by the theatre nurses. Conversely, within the UK, the checklist list was supported by theatre nurses and anaesthetists but met resistance and scepticism by surgeons. It identified a requirement to change the work culture within the operating theatre to achieve transparent, quality and teamwork improvements following its implementation (Vat et al., 2010).

As advocated by Weiser et al. (2010), creating a safety culture cannot simply be achieved through the implementation of a checklist without the promotion of teamwork and communication. There is a need for surgeons, anaesthetists and theatre nurses to recognise the value of the checklist in flattening hierarchy, improving communication, building effective teamwork and safety culture and not viewed as a sole means of checking items (Fudickar et al., 2012).

5.0 PROPOSED RESEARCH METHODOLOGY

5.1 Primary Data Approach
Qualitative research will be conducted to obtain the primary data required to answer the research questions, a similar approach used by Fourade et al. (2012). The employees’ perceptions of the effect the surgical safety checklist has on team cohesion, communication, cultural and operationally within the operating theatres will be measured, in line with the findings from previous international studies (Weiser et al., 2010, Fourade et al., 2012, Takala et al., 2011, Fudickar et al., 2012, Waehle, 2012). This will be achieved by cross sectional semi-structured interviews and a questionnaire survey.

An observational study was considered to visually capture behaviours and effective use of the checklist, however due to the inevitable ‘Hawthorne’ effect it was concluded that the data would be inconclusive. In addition, the collation of comparative data on adverse events pre and post checklist implementation was also considered, however due to time constraints it would be difficult to conclude that a potential reduction was solely due to the checklist or due to co-morbidities during that particular time period. For these reasons these were not considered appropriate.
5.1.1 Determinants to be investigated

In alignment with the literature review the following determinants will be measure based on employees’ perception of the effectiveness of WHO surgical safety checklist:-

i) Operational and culture barriers

ii) Team work

iii) Communication

iv) Reduction in adverse events and errors

5.1.2 Data Collation and Analysis

Semi-structured interview will be undertaken with a selection of surgeons, anaesthetists, theatre scrub nurse, operating theatre practitioners, patient safety officer and the Medical Director from an inductive perspective to understand attitudes, behaviours and opinions regarding the use of the checklist. The interviews will be transcribed, analysed and compared with findings from previous research (Weiser et al., 2010, Fourade et al., 2012, Takala et al., 2011, Fudickar et al., 2012, Waehle, 2012) to identify common determinants.

On completion of the interviews, a review of identified barriers and issues will be analysed to produce an anonymous questionnaire, using ordinal (5 point likert scale) to ask how strongly each discipline agreed or disagreed with a series of attitude, belief and behaviour statements. The questionnaire will be distributed to the clinical professionals (surgeons, anaesthetists, theatre nurses) working within the acute operating theatre suite.

5.1.3 Triangulation with Previous Studies & Continual Review

In order to identify common determinants that impact on effective practice of the checklist, the researcher will triangulate the results of the primary data collection with the finding from previous international studies outlined in section 4.0.

Further reviews will continue throughout the research project to ensure recent studies are included. All literature will be sourced from medical and hospital management journals, books and newspapers from libraries and online.
6.0 REFLECTIONS

6.1 Potential Empirical & Practical Obstacles
The majority of resource required will be available online however access to certain medical journals and research papers may be restricted. Access to these will be addressed by the Hospital and University libraries. In addition, limited availability to academic books in this field of study from libraries will be purchased by the researcher, the cost of which has to be accounted for.

Undertaking one-to-one interviews at a time convenient to participants may be challenging within the limited timeframe however initial contacts will be made prior to University approval so they commence in a timely manner thereafter. Equally engaging staff to complete questionnaires may be challenging. This will be overcome with the promotion of the research as detailed in Appendix Bi. Furthermore, due to the limited access to computers hard copies of the questionnaires will be available within the operating theatre environment.

The extensive literature review, along with the analysis and interpretation of the primary data will require the researcher to work in the library extensively for four months to complete the dissertation by 1st September 2013, which may be compromised by work and family commitments. This will be addressed by appropriate planning as detailed in the timetable (section 7.0).

6.2 Conceptual and Theoretical Problems and Difficulties
The limited availability of relevant clinical data prevents linkage to a reduction in mortality and morbidity with the checklist has led the researcher to examine employee perception of this statement. Furthermore, lack of previous research in the UK measuring the impact of the checklist on team cohesion, communication and culture limits the research to international studies.

6.3 Ethics
The main ethical issue is confidentiality of the organisation and participants involved in the research. This will be overcome by ensuring anonymity during and after the study. As a researcher I have a moral obligation to conduct this research honestly and with
integrity. In practice this will mean that I will obtain informed consent from all potential voluntary participants to both qualitative research methods, as detailed in appendices B and C. Participants will be assured that their anonymity and confidentiality will be protected and of their right to withdraw from the research at any time without explanation. I will avoid deceptive practices and any potential risks to the participants. Furthermore, in line with information governance all primary data obtained will be secured in a locked drawer, only accessible to the researcher and will be destroyed following completion of the dissertation.

This research study has the full support of the Hospital’s Medical Director, Interim Chief Executive and Associate Director of Research and Innovation as it is considered to be a service evaluation research project. A supporting and confirmation email has been sent to the University of Leicester.

6.4 Political Field and Reflection

The issue of my role as a researcher in this ‘political’ field may have two different perspectives. Firstly, my engagement with the Medical Director, Interim Chief Executive, surgeons and anaesthetist with regard to this area of study has received positive feedback and personal interest in terms of my findings. The second reflection may be controversial in terms of how the findings are presented. I will therefore use an open minded approach and awareness of this during the process of my research.
The following timetable may be subject to change following receipt of the proposal results from the University.

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8.0 REFERENCES


Waehle, H. V., Haugen, A. S., Softeland, E., Hjalmhult, E. Adjusting team involvement: a grounded theory study of challenges in utilizing a surgical safety checklist as experienced by nurses in the operating room *BMC Nursing* 2012; 11:16


PARTICIPANT INFORMATION SHEET – STAFF QUESTIONNAIRE

Surgical safety checklist: Evaluating its efficacy within an operating theatre environment of a large UK Hospital

I would be grateful if you would agree to take part in a research study which I am undertaking as part of my dissertation to fulfil the requirements of the Masters in Business Administration degree, through the University of Leicester. This research has been approved by our Medical Director, Interim Chief Executive and Department of Research and Innovation. The project has also been approved through the University of Leicester Research Ethics Approval process. The focus of this research relates to the implementation of the WHO surgical safety checklist within this hospital. The study aims to identify how effective the checklist has been in improving team cohesion, culture and safety. The sub-questions aim to evaluation and identify: -

i) Whether cultural and operational barriers exist within the acute operating theatres which influence best practice.

ii) Whether the checklist has improved communication, dynamics and teamwork within the operating theatre

iii) The perceived impact of the checklist on reducing adverse event and errors.

You have been chosen to participate as your role involves the use of the surgical safety checklist. My intention is collate response from surgeons, anaesthetists and theatre nurses/practitioners to identify employees’ perceptions of the above.

Your participation would involve completing a questionnaire which will take approximately 15 minutes. You can decide to opt out of this research at any time without explanation and ask that any data you have supplied at that point be withdrawn and destroyed. You have the right to omit or refuse to answer or respond to any questions within the questionnaire. The questionnaires will be collated and analysed, with the findings reported in my dissertation. All completed questionnaires will be kept in a locked drawer during the duration of the research and then destroyed following completion of the dissertation (September 2013). There are no known risks to this study as the organisation and names of participants being remain anonymous.

Your participation in this study is voluntary, as there are no funds to allow compensation but I hope that the findings of this research will benefit the Trust’s patient safety agenda in understanding what hinders the clinical teams in embedding best practice, as well as learning whether these are achieved globally in other hospitals and industries.

Should you require any further information about the study then please do not hesitate to contact me on extension 5365 or via email andrea.myerscough@le.ac.uk.

Thank you in anticipation for completing a questionnaire and being part of my research, the findings of which I would be happy to share with you at an appropriate meeting.

Andrea Myerscough [Date]
LETTER TO INTERVIEWS PARTICIPANTS

[DATE]

Dear

Research - Surgical safety checklist: Evaluating its efficacy within an operating theatre environment of a large UK Hospital.

I would be grateful if you would agree to take part in a research study which I am undertaking as part of my dissertation to fulfil the requirements of the Masters in Business Administration degree, through the University of Leicester. This research has been approved by our Medical Director, Interim Chief Executive, Department of Research and Innovation. The project has also been approved through the University of Leicester Research Ethics Approval process.

The focus of this research relates to the implementation of the WHO surgical safety checklist within this hospital. The study aims to identify how effective the checklist has been in improving team cohesion, culture and safety. The sub-questions aim to evaluation and identify: -

iv) Whether cultural and operational barriers exist within the acute operating theatres which influence best practice.

v) Whether the checklist has improved communication, dynamics and teamwork within the operating theatre

vi) The perceived impact of the checklist on reducing adverse event and errors.

You have been chosen to participate as your role involves the use of the surgical safety checklist. My intention is to interview a selection of Consultant surgeons, Anaesthetists, Theatre Nurses/ Practitioners, Medical Director and a Patient Safety Officer to identify employees’ perceptions of the above.

Your participation would involve taking part in an interview at a time and place convenient to you and will last approximately 50 minutes. You can decide to opt out of this research at any time without explanation and ask that any data you have supplied at that point be withdrawn and destroyed. You have the right to omit or refuse to answer or respond to any question that is asked of you and to have your questions about the procedure answered (unless answering these questions would interfere with the study’s outcome). The interview will be audio recorded to allow for transcript analysis, which will be kept in a locked drawer during the duration of the research and then destroyed following completion of the dissertation (September 2013). There are no known risks to this study as the organisation and names of participates will remain anonymous.
Your participation in this study is entirely voluntary, as there are no funds to allow compensation but it is hoped that the findings of this research will benefit the Trust’s patient safety agenda in understanding what hinders the clinical teams in embedding best practice, as well as learning whether these are achieved globally in other hospitals and industries.

I look forward to hearing from you with confirmation of your participation and a date and time which is convenient to you. Should you have any queries then please do not hesitate to contact me via email andrea.myerscough@le.ac.uk or extension 5365.

Thank you.

Yours sincerely

Andrea Myerscough
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<td>3</td>
</tr>
<tr>
<td>Wrong-patient, wrong-site, wrong-procedure</td>
<td>920</td>
<td>93</td>
<td>152</td>
<td>169</td>
</tr>
<tr>
<td>Total Incidents Reviewed</td>
<td>6994</td>
<td>802</td>
<td>1243</td>
<td>901</td>
</tr>
</tbody>
</table>

**Source:** The Joint Commission, statistics as of 31/12/2012

The arrows indicated surgical related incidents and show a significant reduction of adverse events in the UK from 2011 to 2012.
**WHO SURGICAL SAFETY CHECKLIST – STAFF QUESTIONNAIRE**

**Purpose**
As described in the covering information sheet, this questionnaire is part of a research project conducted as part of my MBA dissertation to evaluate the efficacy of the WHO surgical safety checklist within the environment of Acute Block theatres.

**Directions**
For each statement, circle the number that best describes your opinion of this statement:-
1 = Strongly disagree  4 = Agree
2 = Disagree  5 = Strongly agree
3 = Neutral

<table>
<thead>
<tr>
<th></th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The checklist has in my personal experience prevented an adverse incident/error in theatre</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. The checklist makes surgical care safer</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3. The checklist has had a positive impact on the safety culture in theatres</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. The checklist improves interdisciplinary teamwork</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5. The checklist improves team cooperation</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6. The checklist improves my understanding of roles and responsibilities in theatre</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7. The checklist has removed hierarchical boundaries</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8. The checklist improves multi-disciplinary communication in theatre</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9. The checklist improves the transfer of information in theatre</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>10. The checklist improves my knowledge of patient identity, medical history, medications, allergies and procedure</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>11. The checklist enables me to express my own opinion relating to clinical situations</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>12. The checklist process improves my confidence and empowerment in theatre</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>13. I feel embarrassed or awkward during the introduction part of the team brief</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>14. The checklist is seen as an important patient safety tool by all the multi-disciplinary team</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>15. The checklist is easy to use</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>16. If I had designed the checklist I would have included very similar items</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>17. There is 100% compliance with the checklist across all elective theatres</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>18. There is 100% compliance with the checklist in the trauma theatre</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>19. There is 100% compliance with the checklist in the emergency theatre</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>20. The checklist has identified reportable incidents, such as no patient ID band, no signed consent, patient not marked</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>21. The checklist reduces the incidence of post</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>operative infections/complications</td>
<td>Strongly disagree</td>
<td>Disagree</td>
<td>Neutral</td>
<td>Agree</td>
<td>Strongly Agree</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>------------------</td>
<td>----------</td>
<td>---------</td>
<td>-------</td>
<td>---------------</td>
</tr>
<tr>
<td>22. The checklist is seen as an unnecessary paper exercise</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>23. The checklist is seen as safety tool enforced by management</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>24. The checklist is time consuming</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>25. There is still resistance to complete the checklist</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>26. All the multi-disciplinary team are present during the 'Team Brief'</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>27. All the multi-disciplinary team are present during the 'Time Out' stage</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>28. All the multi-disciplinary team are present during the 'Sign Out' stage</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>29. There is an effective ‘De-brief’ carried out after each case</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>30. Appropriate training was provided with regard to the effective use and completion of the checklist</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>31. A team approach to training would have been beneficial before the implementation of the checklist</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>32. I would want the checklist to be used if I was having a surgical intervention or procedure</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

**Professional background**

- □ Surgeon
- □ Surgical Register
- □ Anaesthetists
- □ Trainee Anaesthetist
- □ Scrub Nurse
- □ Anaesthetic Practitioner/Nurse
- □ Circulating Nurse
- □ Health Care Support Worker
- □ Trainee ODPs
- □ Radiographer

**Experience in Current Role**

- □ < 1 Year
- □ 1-2 Years
- □ 2-5 Years
- □ 5-10 Years
- □ 10+ Years

---

Thank you for your participation

Andrea Myerscough
TEMPLATE OF QUESTIONS FOR SEMI-STRUCTURE INTERVIEW

EVALUATING THE EFFICACY OF THE WHO SURGICAL SAFETY CHECKLIST & TEAM BRIEF

MEDICAL DIRECTOR & PATIENT SAFETY LEADS

<table>
<thead>
<tr>
<th>Participant details</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of interview</td>
<td></td>
</tr>
</tbody>
</table>

1. Do you accept the concept that the team brief and WHO surgical safety checklist in prevent avoidable errors, improving communication and teamwork within the operating theatre?
   
   Yes ☐ No ☐

   Why? ________________________________________________

2. In your opinion, what key principles would you expect the team brief and WHO surgical safety checklist to achieve within the operating theatre environment?

   ______________________________________________________________________________________________

3. In your opinion, do you believe that the team brief and WHO surgical safety checklist has reduced adverse incidents and errors since its introduction?

   Yes ☐ No ☐

   If yes, can you give examples? ________________________________________________________________

   If no, why is this ________________________________________________________________

4. How do you feel the team brief and checklist has influenced the surgical, anaesthetic and theatre team?

   ______________________________________________________________________________________________

5. In your opinion, do you believe that the team brief and WHO surgical safety checklist has improved communication across the multi-disciplinary team?

   Yes ☐ No ☐

   If yes, in what way? ___________________________________________________________________________

   If no, why is this? ____________________________________________________________________________
6. Are you aware of any operational and cultural barriers to the effective & appropriate use of the WHO surgical safety checklist and team brief?

Yes □ No □

If yes, what are these & how can they be overcome? _____________________________________

7. In your opinion, do you believe that the team brief and WHO surgical safety checklist were implemented effectively to achieve successful Trust-wide adoption?

Yes □ No □

If yes, in what way? ________________________________________________________________

If no, why is this & what could be done differently in future safety tool implementations?
________________________________________________________________________________

Other discussions/points:
# Template of Questions for Semi-Structure Interview

## Evaluating the Efficacy of the WHO Surgical Safety Checklist & Team Brief

**Surgeons, Anaesthetist, Scrub Nurses & Anaesthetic Practitioners**

<table>
<thead>
<tr>
<th>Participant details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of interview</td>
</tr>
</tbody>
</table>

1. Do you accept the concept of the WHO surgical safety checklist & team brief in prevent avoidable errors, improving communication and teamwork within the operating theatre?

   Yes [ ] No [ ]

   Why? ____________________________

2. In your opinion, do you believe that the WHO surgical safety checklist & team brief has reduced adverse incidents and errors in your practice since its introduction?

   Yes [ ] No [ ]

   If yes, can you give examples ____________________________

   If no, why is this ____________________________

3. In your opinion, do you believe that the WHO surgical safety checklist & team brief has helped define roles and responsibilities within theatre?

   Yes [ ] No [ ]

   If yes, in what way? ____________________________

   If no, why is this? ____________________________

4. In your opinion, do you believe that the WHO surgical safety checklist & team brief has improved inter-disciplinary teamwork?

   Yes [ ] No [ ]

   If yes, in what way? ____________________________
5. In your opinion, do you believe that the WHO surgical safety checklist & team brief has introduced tensions within the team between surgeons, anaesthetist and/or theatre staff due to the lack of available personnel at the right time, i.e. surgeon, anaesthetists and/or theatre staff being available at the three stages of the checklist?

Yes ☐ No ☐

If yes, can you give examples? ______________________________________________________

If no, why is this? __________________________________________________________________

6. In your opinion, do you believe that the WHO surgical safety checklist & team brief has improved communication across the interdisciplinary team?

Yes ☐ No ☐

If yes, in what way? ________________________________________________________________

If no, why is this? __________________________________________________________________

7. Can you describe a situation where it has been a useful, or a positive experience utilising the checklist & team brief?

________________________________________________________________________________

8. Can you describe a situation where it has been difficult to utilise the checklist?

________________________________________________________________________________

9. How do you feel the checklist & team brief has influenced the surgical team?

________________________________________________________________________________

10. How do you think the checklist & team brief affects your professional duties within the surgical team?

________________________________________________________________________________

11. At the team brief, do you feel confident to introduce yourself and state your role within theatres or feel awkward and embarrassed?

Confident ☐ Embarrassed ☐

12. In your opinion, do you believe that the WHO surgical safety checklist & team brief has empowered you within the operating theatre?

If yes, in what way? ________________________________________________________________

If no, why is this? __________________________________________________________________
13. In your opinion, do you perceive there are culture barriers that impact on the effective & appropriate use of the WHO surgical safety checklist & team brief?

Yes ☐ No ☐

If yes, in what way? ________________________________________________________________

14. Can you describe what hinders the effective & appropriate use of the WHO surgical safety checklist & team brief?

Yes ☐ No ☐

If yes, what are these & how can they be overcome? ______________________________________

15. In your opinion, do you believe that the team brief and WHO surgical safety checklist are undertaken/used effectively in the emergency/trauma theatre as it is in elective theatres?

Yes ☐ No ☐

If yes, additional information________________________________________________________

If no, why is this? __________________________________________________________________

16. In your opinion, do you believe that the team brief & WHO surgical safety checklist was implemented effectively?

Yes ☐ No ☐

If yes, in what way? ________________________________________________________________

If no, why is this & what could be done differently in the future to adopt safety tools?
________________________________________________________________________________

Other discussions/points:
LETTER TO INTERVIEWS PARTICIPANTS

Dear

Research - Surgical safety checklist & team brief: Evaluating its efficacy within an operating theatre environment of a large UK Hospital.

I would be grateful if you would agree to take part in a research study which I am undertaking as part of my dissertation to fulfil the requirements of the Masters in Business Administration degree, through the University of Leicester. This research has been approved by our Medical Director, Interim Chief Executive, Department of Research and Innovation. The project has also been approved through the University of Leicester Research Ethics Approval process.

The focus of this research relates to the implementation of the WHO surgical safety checklist and team brief within this hospital. The study aims to identify how effective the checklist and team brief have been in improving team cohesion, culture and safety. The sub-questions aim to evaluation and identify: -

i) Whether cultural and operational barriers exist within the acute operating theatres which influence best practice.

ii) Whether the checklist and team brief have improved communication, dynamics and teamwork within the operating theatre

iii) The perceived impact of the checklist and team brief on reducing adverse event and errors.

You have been chosen to participate as your role involves the use of the surgical safety checklist. My intention is to interview a selection of Consultant surgeons, Anaesthetists, Theatre Nurses/ Practitioners, Medical Director and a Patient Safety Officer to identify employees’ perceptions of the above.

Your participation would involve taking part in an interview at a time and place convenient to you and will last approximately 50 minutes. You can decide to opt out of this research at any time without explanation and ask that any data you have supplied at that point be withdrawn and destroyed. You have the right to omit or refuse to answer or respond to any question that is asked of you and to have your questions about the procedure answered (unless answering these questions would interfere with the study’s outcome). The interview will be audio recorded to allow for transcript analysis, which will be kept in a locked drawer during the duration of the research and then destroyed following completion of the dissertation (September 2013). There
are no known risks to this study as the organisation and names of participates will remain anonymous.

Your participation in this study is entirely voluntary, as there are no funds to allow compensation but it is hoped that the findings of this research will benefit the Trust’s patient safety agenda in understanding what hinders the clinical teams in embedding best practice, as well as learning whether these are achieved globally in other hospitals and industries.

I look forward to hearing from you with confirmation of your participation and a date and time which is convenient to you. Should you have any queries then please do not hesitate to contact me via email andrea.myerscough@le.ac.uk or extension 5365.

Thank you.

Yours sincerely

Andrea Myerscough
INFORMED CONSENT

Appendix G

Consent for Participating in a Research Study

Surgical safety checklist: Evaluating its efficacy within an operating theatre environment of a large UK Hospital.

June/July 2013

I, the undersigned consent to being interviewed as part of a research study which the researcher is undertaking as part of a dissertation to fulfil the requirements of the Mastere in Business Administration degree, through the University of Leicester. I understand that the interview will be audio recorded to allow for transcript analysis, which will be kept in a locked drawer during the duration of the research and then destroyed following completion of the dissertation (September 2013) and that the names of participates will remain anonymous.

<table>
<thead>
<tr>
<th>Position</th>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical Director</td>
<td></td>
<td>9/6/13</td>
</tr>
<tr>
<td>Head of Safety &amp; Quality</td>
<td></td>
<td>17/6/13</td>
</tr>
<tr>
<td>Safety &amp; Quality Manager</td>
<td></td>
<td>28/6/13</td>
</tr>
<tr>
<td>Consultant Anaesthetist/ Speciality Lead</td>
<td></td>
<td>13/6/13</td>
</tr>
<tr>
<td>Consultant Anaesthetist</td>
<td></td>
<td>12/6/13</td>
</tr>
<tr>
<td>Consultant Anaesthetist</td>
<td></td>
<td>19/1/13</td>
</tr>
<tr>
<td>Consultant Surgeon (Vascular Surgery)</td>
<td></td>
<td>10/6/13</td>
</tr>
<tr>
<td>Consultant Surgeon (General Surgery)</td>
<td>ADK</td>
<td>24/6/13</td>
</tr>
<tr>
<td>Consultant Surgeon (Trauma &amp; Orthopaedics)</td>
<td>ADHTM</td>
<td>15/7/13</td>
</tr>
<tr>
<td>Senior Scrub Nurse</td>
<td></td>
<td>18/6/13</td>
</tr>
<tr>
<td>Senior Anaesthetic Practitioner/Nurse</td>
<td></td>
<td>20/6/13</td>
</tr>
<tr>
<td>Healthcare Assistant</td>
<td></td>
<td>17/06/13</td>
</tr>
</tbody>
</table>
LETTER REQUESTING CONSENT FOR THE RESEARCH

23rd February 2013

XXX
Interim Chief Executive
University Hospitals of XXX

Dear XXXX,

Re: Research Request

I am currently undertaken a Masters in Business Administration through the University of Leicester and am required to undertake a research study as part of my final dissertation module.

The focus of my research relates to the implementation and efficacy of the World Health Organisation (WHO) safer surgery checklist and team brief across the operating theatres and to explore the views and perceptions of staff working within the acute operating theatres. The specific objectives are:-

   i) To identify whether cultural and operational barriers exist which influence the effective use of the safer surgery checklist and the role of the hierarchy;
   ii) The impact of the team brief and checklist on improving communication and teamwork;
   iii) The impact of the team brief and checklist on reducing adverse event and errors.

The primary data will be collected through qualitative and quantitative methods, that being one-to-one interviews with the Medical Director, Head of Quality & Safety, Quality & Safety Manager, Consultant Surgeons, Consultant Anaesthetists and theatre personnel and a questionnaire will be sent to 100 employees working within the acute operating theatre. There are no known risks to this study as the research will be completely anonymised, remain confidential, with the organisation and names of participates being unidentifiable.

I therefore ask for your approval to conduct the above research, which I expect to commence at the beginning of May 2013 and complete by the end of August 2013.

Yours sincerely

Andrea Myerscough
Directorate Manager of Theatres
I would be grateful if you would agree to take part in a research study which I am undertaking as part of my dissertation to fulfil the requirements of the Masters in Business Administration degree, through the University of Leicester. This research has been approved by our Medical Director, Interim Chief Executive and Department of Research and Innovation. The project has also been approved through the University of Leicester Research Ethics Approval process. The focus of this research relates to the implementation of the WHO surgical safety checklist within this hospital. The study aims to identify how effective the checklist has been in improving team cohesion, culture and safety. The sub-questions aim to evaluation and identify: -

i) Whether cultural and operational barriers exist within the acute operating theatres which influence best practice.

ii) Whether the checklist has improved communication, dynamics and teamwork within the operating theatre

iii) The perceived impact of the checklist on reducing adverse event and errors.

You have been chosen to participate as your role involves the use of the surgical safety checklist. My intention is to collate responses from surgeons, anaesthetists and theatre nurses/practitioners to identify employees’ perceptions of the above.

Your participation would involve completing a questionnaire which will take approximately 15 minutes. You can decide to opt out of this research at any time without explanation and ask that any data you have supplied at that point be withdrawn and destroyed. You have the right to omit or refuse to answer or respond to any questions within the questionnaire. The questionnaires will be collated and analysed, with the findings reported in my dissertation. All completed questionnaires will be kept in a locked drawer during the duration of the research and then destroyed following completion of the dissertation (September 2013). There are no known risks to this study as the organisation and names of participates being remain anonymous.

Your participation in this study is voluntary, as there are no funds to allow compensation but I hope that the findings of this research will benefit the Trust’s patient safety agenda in understanding what hinders the clinical teams in embedding best practice, as well as learning whether these are achieved globally in other hospitals and industries.

Should you require any further information about the study then please do not hesitate to contact me on extension 5365 or via email andrea.myerscough@le.ac.uk.

Thank you in anticipation for completing a questionnaire and being part of my research, the findings of which I would be happy to share with you at an appropriate meeting.

Andrea Myerscough

[Date]
### CASE SUMMARIES – MEDIAN VALUES REPORT

<table>
<thead>
<tr>
<th>Revised Staff Grouping</th>
<th>Consultant Surgeon</th>
<th>Surgical Registrar</th>
<th>Anaesthetist</th>
<th>Scrub Nurse/ HCA</th>
<th>Anaesthetic Practitioner/ Nurse</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>The checklist has in my person experience prevented and error from occurring in theatre</td>
<td>3</td>
<td>3.5</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>3.5</td>
</tr>
<tr>
<td>The checklist makes surgical care safer</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>The checklist has had a positive impact on the safety culture in theatres</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>The checklist improves interdisciplinary teamwork</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>The checklist improves team cooperation</td>
<td>4</td>
<td>3.5</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>The checklist improves my understanding of roles and responsibilities within theatre</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>The checklist has removed hierarchical boundaries</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>The checklist improves multi-disciplinary communication in theatre</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>The checklist improves the transfer of information in theatres</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
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<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>The checklist enables me to express my own opinion relating to clinical situations</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>3.5</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>The checklist process improves my confidence and empowerment in theatre</td>
<td>2.5</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>I feel embarrassed or awkward during the introduction part of the checklist</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>The checklist is seen as an important patient’s safety tool by all the multi-disciplinary team</td>
<td>3.5</td>
<td>3</td>
<td>3</td>
<td>3.5</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>The checklist is easy to use</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>If I had designed the checklist I would have included similar items</td>
<td>3.5</td>
<td>3.5</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>There is 100% compliance with the checklist across all elective theatres</td>
<td>3</td>
<td>4.5</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>There is 100% compliance with the checklist in the trauma theatre</td>
<td>3</td>
<td>3.5</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2.5</td>
</tr>
<tr>
<td>There is 100% compliance with the checklist in the emergency theatre</td>
<td>3.5</td>
<td>3.5</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>The checklist has identified reportable incidents such as no patient ID band, no signed consent form, patient not marked</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
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<tr>
<td>The checklist reduced the incidence of post operative infections/ complications</td>
<td>2.5</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>The checklist is unnecessary paper exercise</td>
<td>3</td>
<td>2.5</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Revised Staff Grouping</td>
<td>Consultant Surgeon</td>
<td>Surgical Registrar</td>
<td>Anaesthetist</td>
<td>Scrub Nurse/ HCA</td>
<td>Anaesthetic Practitioner/ Nurse</td>
<td>Total</td>
</tr>
<tr>
<td>------------------------</td>
<td>--------------------</td>
<td>--------------------</td>
<td>--------------</td>
<td>-----------------</td>
<td>-------------------------------</td>
<td>-------</td>
</tr>
<tr>
<td>The checklist is seen as a safety tool enforced by management</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>The checklist is time consuming</td>
<td>4</td>
<td>2.5</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>There is still resistance to complete the checklist</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>All the multi-disciplinary team are present during the 'Team Brief'</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>All the multi-disciplinary team are present during the 'Time Out' stage</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>2.5</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>All the multi-disciplinary team are present during the 'Sign Out' stage</td>
<td>2</td>
<td>2.5</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>There is an effective 'De-brief' carried out after each case</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Appropriate training was provided with regard to the effective use and completion of the checklist</td>
<td>2.5</td>
<td>2.5</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2.5</td>
</tr>
<tr>
<td>A team approach to training would have been beneficial before the implementation of the checklist</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>I would want the checklist to be used if I was having a surgical intervention or procedure</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

**Key:**
1 = Strongly disagree
2 = Disagree
3 = Neutral
4 = Agree
5 = Strongly agree
## THEMATIC ANALYSIS REPORT - QUALITATIVE DATA COLLECTION

<table>
<thead>
<tr>
<th>Theme</th>
<th>Sub-theme</th>
<th>No. of participants who stated this</th>
<th>No. of times</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Teamwork and Communication</strong></td>
<td>Improves efficiency</td>
<td>6 (S=2, SN=1, HQS=1, QSM=1, HCA=1)</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Improves list planning</td>
<td>12 (S=3, A=3, MD=1, HQS=1, QSM=1, SN=1, ANP=1, HC=1)</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>Staff are better informed</td>
<td>12 (S=3, A=3, MD=1, HQS=1, QSM=1, SN=1, ANP=1, HC=1)</td>
<td>53</td>
</tr>
<tr>
<td></td>
<td>Improves staff morale</td>
<td>6 (S=1, A=2, SN=1, ANP=1, HCA=1)</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Beneficial to know who everyone is and their role &amp; responsibility</td>
<td>12 (S=3, A=3, MD=1, HQS=1, QSM=1, SN=1, ANP=1, HC=1)</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>More empowered</td>
<td>12 (S=3, A=3, MD=1, HQS=1, QSM=1, SN=1, ANP=1, HC=1)</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>Part of a team/team approach</td>
<td>10 (S=3, A=3, MD=1, SN=1, ANP=1, HC=1)</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Good aid memoire</td>
<td>10 (S=3, A=3, MD=1, SN=1, ANP=1, HC=1)</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Shared goal</td>
<td>4 (3=S, 1=QSM)</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Staff feel valued</td>
<td>5 (A=2, SN=1, ANP=1, HCA=1)</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Doesn’t help poor functioning teams</td>
<td>3 (A=2, MD=1)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Need to formalise the team brief process</td>
<td>6 (S=3, A=3, )</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Need to do a de-brief</td>
<td>3 (S=1, MD=1, HQS=1)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Clinical competence is as important as good communication skills</td>
<td>8 (S=3, A=2, MD=1, HQS=1, SN=1)</td>
<td>8</td>
</tr>
<tr>
<td><strong>Patient Safety</strong></td>
<td>Identifies gaps in the process, such as missing ID band, signed consent</td>
<td>8 (S=2, A=3, SN=1, ANP=1, SN=1)</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Ensure all essential equipment is in place</td>
<td>12 (S=3, A=3, MD=1, HQS=1, QSM=1, SN=1, ANP=1, HC=1)</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>Reduces complication and ‘Never Events’</td>
<td>12 (S=3, A=3, MD=1, HQS=1, QSM=1, SN=1, ANP=1, HC=1)</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>Improves timeliness of antibiotics</td>
<td>7 (S=1, A=3, SN=1, ANP=1, HC=1)</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Improves clinical effectiveness and practice</td>
<td>9 (S=3, A=3, SN=1, ANP=1, HCA=1)</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Only works if you have 100% buy-in</td>
<td>6 (S=2, A=1, MD=1, HQS=1, ANP=1)</td>
<td>6</td>
</tr>
<tr>
<td><strong>Operational Barriers</strong></td>
<td>Timing of the checklist &amp; team brief</td>
<td>3 (A=3)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>No specified time for team brief to ensure that everyone is present</td>
<td>8 (S=2, A=3, SN=1, ANP=1, HCA=1)</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Duplication</td>
<td>5 (S=2, A=3)</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Order and appropriateness of some questions on checklist</td>
<td>7 (S=2, A=3, SN=1, HCA=1)</td>
<td>7</td>
</tr>
<tr>
<td><strong>Cultural Barrier</strong></td>
<td>Accepted the concept of the checklist and team brief</td>
<td>12 (S=3, A=3, MD=1, HQS=1, QSM=1, SN=1, ANP=1, HC=1)</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Would want checklist and team brief to be in place if undergoing surgery</td>
<td>12 (S=3, A=3, MD=1, HQS=1, QSM=1, SN=1, ANP=1, HC=1)</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Perceived generation gap</td>
<td>7 (S=2, A=2, MD=1, ANP=1, HCA=1)</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Hierarchy still exists with some surgeons and anaesthetists</td>
<td>3 (1=SN, 1=ANP, 1=HCA)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Resistance due to lack of understanding/acceptance of the principles</td>
<td>12 (S=3, A=3, MD=1, HQS=1, QSM=1, SN=1, ANP=1, HCA=1)</td>
<td>12</td>
</tr>
<tr>
<td>Theme</td>
<td>Sub-theme</td>
<td>No. of participants who stated this</td>
<td>No. of times</td>
</tr>
<tr>
<td>---------------------</td>
<td>---------------------------------------------------------------------------</td>
<td>------------------------------------------------------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Implementation</td>
<td>Medical Director and Clinical leadership essential</td>
<td>6 (S=1, A=2, MD=1, HQS=1, QSM=1)</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Escalation process improved compliance</td>
<td>8 (S=1, A=2, MD=1, HQS=1, QSM=1, SN=1, ANP=1)</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Team-based, situational awareness and human factor training prior to implementation would’ve been beneficial to standardise process</td>
<td>10 (S=2, A=2, MD=1, HQS=1, QSM=1, SN=1, ANP=1, HCA=1)</td>
<td>10</td>
</tr>
</tbody>
</table>

**Key:**

S = Consultant Surgeon  
A = Consultant Anaesthetist  
MD = Medical Director  
HQS = Head of Quality & Safety  
QSM = Quality & Safety Manager  
SN = Scrub Nurse  
ANP = Anaesthetic Nurse Practitioner  
HCA = Health Care Assistant