

Exploring followership, hierarchical structures and barriers to effective communication during paediatric and neonatal emergency situations and resuscitation in district general and tertiary hospitals in the United Kingdom: a qualitative study.

Exploring Followership, Hierarchical structures and barriers to effective communication during paediatric and neonatal emergency situations and resuscitations in district general and tertiary hospitals in the United Kingdom: a qualitative study

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Abbreviations

A&E	Accident and Emergency
APLS	Advanced Paediatric Life Support
DGH	District General Hospital
ED	Emergency Department
GMC	General Medical Council
NHS	National Health Service
NICU	Neonatal Intensive Care Unit
NLS	Newborn Life Support
PICU	Paediatric Intensive Care Unit
UK	United Kingdom

Glossary of terms

Critical theory	A study approach designed to challenge social conventions with the aim of making social change (Stewart and Filice de Barros, 2018)
Grounded theory	It is a data analysis theoretical framework of building theories based on methodical gathering and analysis of data using an iterative study design (Glaser <i>et al.</i> , 2019)
Inductive approach	A data analysis method whereby theories are proposed towards the end of the research based on observations gathered throughout the study (Stewart and Filice de Barros, 2018)
Prospective	A prospective study is one where recruitment occurs prior to the event being observed/changed occurs.
Qualitative research	It is the scientific method of gathering non-numerical data, and aspires to interpretation and deeper understanding of the subject matter (Stewart and Filice de Barros, 2018)
Retrospective	A retrospective study is one where recruitment occurs after the event being observed/changed has occurred.
Resuscitation	The act of attending to the abnormal physiological parameters of a patient with the aim of improving them in the very acute phase. In our study, resuscitation was an umbrella term to encompass both critically unwell patients and those whose heart had stopped (cardio-pulmonary arrest)
Shared mental model	A knowledge structure which helps coordinate actions of the team by being able to describe the task, the roles within the team and the strategy (Van den Bossche <i>et al.</i> , 2011)
Theoretical saturation	The point when the sample size has reach a stage where no new ideas are being generated through subsequent observation/interviews (Jha and Price, 2018)

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Abstract

Background: Paediatric and neonatal resuscitation are rare events with high morbidity and mortality. They are complex scenarios requiring skilled leadership, a structured approach, good teamwork. The outcomes are slightly improved in tertiary hospitals compared to district general hospitals. When adverse events occur, teamwork and communication are the most contributory factors

Aim: The study aimed to explore the barriers to communication, followership aspects and hierarchical structures present within paediatric and neonatal resuscitation in both district general hospitals and tertiary hospitals. Factors affecting active followership and rigid hierarchical structures were also explored

Method: A qualitative study was performed with semi-structured interviews with health professionals involved in neonatal and paediatric resuscitation across 5 different hospitals. Data was analysed based on their experience of a memorable real-life scenario they recalled and their views on various aspects of resuscitation. The interviews were audio recorded, then transcribed and thematic analysis performed according to a grounded theory framework.

Results: 24 participants were interviewed and described 57 scenarios. These scenarios described issues with communication in 44%, team working in 24%, leadership in 21% and hierarchy in 40%. The barriers to communication included lack of experience, big teams, unfamiliar team members or environments and presence of parents. Prior negative experience, fear of undermining colleagues and steep hierarchy also made call-out less likely. Inexperienced staff members were more likely to be passive followers, and other factors affecting followership were exposure to clinical scenarios, team composition, leader characteristics, support from other team members and presence of a shared mental model. Paediatric and neonatal resuscitation operated on a flatter hierarchy compared to other specialties, however there were still some innate chain of command present amongst nurses, midwives and doctors. There were different perceptions of leadership from different team members, leading to some confusion impacting on followership and communication. Leadership was also very varied depending on case, team composition and location. Team members in tertiary hospitals were more confident and more active followers compared to those in district general hospital

Conclusion: Human factors impact on communication, teamwork and leadership during paediatric and neonatal resuscitation. Presence of parents had a significant impact on communication. It is important to recognise these factors to better address them in future resuscitation training.

1. INTRODUCTION

1.1 BACKGROUND

While there has been a significant decrease in childhood mortality worldwide, children still continue to suffer from potentially life threatening acute illness or injury (Samuels and Wieteska, 2016). For example, the incidence of in-patient paediatric cardiac arrests was 2.2% (Gall *et al.*, 2014) and the incidence of out of hospital cardiac arrests was 3.3 per 100,000 (Rajan *et al.*, 2015). Similarly newborns can rarely be quite unwell during birth and up to 4 per 1000 may require invasive ventilation (Wyllie, 2016). In the United Kingdom (UK), resuscitation of acutely unwell babies and children can either occur in secondary care (also called district general hospitals) or tertiary hospitals which deliver more specialised treatment, and within paediatrics and neonates have an appropriate intensive care unit on site. The outcomes following cardiac pulmonary resuscitation are generally poor, with less than 5% surviving to hospital discharge (Michiels *et al.*, 2013). While these are rare occurrences, it is nevertheless important to identify aspects which could be improved in those situations.

Paediatric and neonatal resuscitation are highly complex, and require a skilled team leader, a structured approach, adherence to certain algorithms and teamwork amongst the various team members to achieve a favourable outcome (Samuels and Wieteska, 2016). When adverse events occur in healthcare, teamwork and communication are the most common contributory factors (Manser, 2009). Human factors are therefore at the heart of potential adverse events during resuscitation.

1.2 STATEMENT OF THE PROBLEM

Training programmes for undergraduate and postgraduate trainees use simulation training within structured courses such as the advanced paediatric life support and neonatal life support courses at a national level (Samuels and Wieteska, 2016; Wyllie, 2016). These courses have explored the human factors associated within resuscitation and identify good aspects of leadership, teamwork and communication skills. They also provide information on the importance of 'closed loop communication' and 'call out'. 'Closed loop communication' is a verbal feedback method which consists of a sender transmitting a message, the receiver acknowledging the message, and the sender verifying that the message was received correctly (Härgestam *et al.*, 2013). 'Call out' can be described as the first verbalisation of an important change by a team member, especially when something appears to be wrong (Härgestam, Lindkvist, Brulin, Jacobsson and Hultin, 2013).

Although some studies have shown that training can improve teamwork in simulated cardiopulmonary arrest events (Mahramus et al., 2016), they focused mainly on performance and self-assessment of participants before and after the simulation training. It is difficult to know if simulation training translates to an improvement in real-life performance. Moreover, even when simulation training teaches communication skills, there is no guarantee that they are used afterwards as demonstrated by Hargestam et al.'s study where close loop communication and call outs were not used adequately despite scenarios focusing on the importance of communication (2013). I have been witnessed to situations where call-out was not done in real life scenarios, although team members could clearly see that the patient was deteriorating. I have also been in resuscitation scenarios where closed loop communication was not performed adequately and mistakes involving drug administration occurred. I therefore feel that barriers to communication during real-life scenarios merit further study.

The training courses focus on simulation training with the participant in a leader role, whereby they are assessing the situation and communicating with team members. The courses also focus on attributes of a good leader including situational awareness, communication skills, decision making and prioritisation (Samuels and Wieteska, 2016). This is despite the fact that resuscitation teams are multidisciplinary and may include midwives, nurses and doctors of different levels of seniority. Other studies focusing on simulation training similarly advocate teaching the non-technical skills such as leadership (Clerihew, Rowney and Ker, 2016). There is a lesser focus on followership training, and how to be an effective follower. When I last attended a newborn life support course, I witnessed junior nurses roleplaying unrealistic scenarios where they have to remain in the leadership position throughout the whole scenario, when in real-life they would quickly be supported by more senior members of staff. I therefore want to explore what are the characteristics of followership among team members and what factors influence how effective a team member will be in the follower role.

Moreover, communication and teamwork depend on the hierarchical structures present. Simulation training in medicine is based on crew resource management training (Lindquist, 2009) which advocates a flatter hierarchy in emergencies (Gross, 2014). However, despite the emphasis on a flatter hierarchy, issues still persist when simulation scenarios designed to challenge authority are studied. Moreover, hierarchical structures are also important in determining a clear leadership. I have been in scenarios where it wasn't clear who was the team leader, and I have sometimes struggled to assert leadership when different specialities are present at a resuscitation.

Finally, the location of the resuscitation has to be considered. Although there is no data for paediatric resuscitation, inferences can be made looking at data obtained from the reconfiguration of services in the UK of trauma care: in 2012, patients with

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severe trauma would be transported straight to major trauma centres. This was associated with improving patient outcomes after severe injury (Moran *et al.*, 2018). Similarly, neonatal mortality was improved in tertiary, high-volume neonatal units as compared to lower volume units (S. I. Watson *et al.*, 2014). At present, patients can present in a critically unwell fashion to both district general hospital (DGH) and tertiary hospitals (which are more specialised)- I feel this is an important area of study as there may be human factors which can inform how training is developed in the DGH.

1.3 AIMS OF THE STUDY:

The aims of the study are to explore the barriers to communication and call-out, the characteristics of followers and factors impacting on followership, the hierarchical structures present during resuscitation and factors impacting them, and the differences in healthcare professionals' (HCP) attitudes in district general and tertiary hospitals in the UK.

1.4 RESEARCH QUESTIONS

1. During a paediatric or neonatal resuscitation, what are the factors which are barriers to communication and call-out?
2. During a paediatric or neonatal resuscitation, what is the attitude of team members from a followership framework, and what factors impact on followership?
3. What is the perceived hierarchy within a paediatric or neonatal resuscitation and are there factors affecting this hierarchy?
4. What are the differences in resuscitation between tertiary and district general hospitals?

2. LITERATURE REVIEW

2.1 PURPOSE OF LITERATURE REVIEW

A review of the current evidence and opinions around paediatric and neonatal resuscitation, and the factors impacting them, including communication, followership and hierarchy is required to inform what is currently known on the topic and better refine the study research questions.

This section will deal with current evidence around those topics, including the need to widen the research focus to other medical fields such as adult resuscitation,

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trauma scenarios, anaesthetics, as well as non-medical fields such as business and aviation industry.

Looking at the literature review will also allow me to identify the correct methodology and inform the data gathering methods.

The keywords used, search terms and reference manager are described in Appendix A. Examples of search for literature are also described.

2.2 CRITERIA FOR INCLUSION/EXCLUSION

Initially the search terms were focused on paediatric and neonatal resuscitations in real life scenarios or retrospective review. I was concerned of missing relevant or important studies in human factors not specific to paediatrics: the rationale being that issues noted during adult resuscitation may be universal and apply to paediatric and neonatal resuscitation as well (Appendix B). I also included simulation training as this would be an interesting study method to review, and simulation studies are likely to be more controlled and better observed or studied.

The incidence of paediatric and neonatal resuscitation, composition of a paediatric or neonatal team and similarities to adult resuscitation are described in Appendix B and give the reader a better understanding of how resuscitation occurs and why some adult papers were included in the literature review. (See Appendix B)

2.3 FINDINGS:

2.3.1 Team Communication Aspects

Adverse events in medicine are often caused by poor communication (La Pietra *et al.*, 2005). The Newborn life support (NLS) manual and the Advanced Paediatric life Support (APLS) manual both describe non-technical aspects of resuscitation, advocating the need to communicate observations and decisions effectively. A systematic way of communication (situation, background, assessment, recommendation, or SBAR (Wyllie, 2016) is described, and constant communication with the team leader is encouraged. Furthermore, the manual suggests that instructions should be aimed at particular individuals with clear expectations. The concepts of 'closed loop communication', where the person being instructed needs to give a response to confirm receipt of the information, and 'call out', where any team member can raise concerns whenever they recognise something important, are

also described and encouraged (Samuels and Wieteska, 2016; Wyllie, 2016). Similar concepts are taught worldwide, for example the Team Strategies and Tools to Enhance Performance and Patients safety uses similar methods (King *et al.*, 2008).

Some studies have reviewed communication aspects during resuscitation, and how they may be improved.

Observational studies performed in the field of neonatal resuscitation found significant deviations from the algorithm, and the commonest cause was poor communication (Carbine *et al.*, 2000; Thomas *et al.*, 2006). A further review of communication patterns during neonatal resuscitation from transcripts obtained from delivery rooms noted only 5-15% of statements were related to clinically relevant topics- there was an excess of 'imprecise and nonstandard language' with the associated risk of misinterpretation, distraction or misunderstanding (Yamada, Yaeger and Halamek, 2015). Other studies have looked at specific aspects of communication, including call out and closed loop communication. One study showed that the use of call-out and closed loop communication was limited- despite the fact that 74% of participants had previously participated in team training, where call-out and closed loop communication was emphasised (Hargestram, Lindkvist, Brulin, Jacobsson, Hultin, *et al.*, 2013). While other studies have shown that simulation training improves teamwork and performance (Thomas *et al.*, 2010; Mahramus *et al.*, 2016), Hargestram *et al.* (2013) suggest that some aspects of communication are not being monitored and observed, which may impact in real-life scenarios. Another study highlights the fact that closed loop communication is an effective, yet underutilised communication tool in real life: El-Shafy *et al.* (2017) analysed video recordings of paediatric trauma activations and found that only one-third was directed to a specific individual and only one-quarter involved closed loop communication.

Poor communication can have significant effects: a study reviewing critical incidents related to cardiac arrests was performed and found that in 11/122 cases (10%), there was disorganised resuscitation due to inadequate communication or unclear leadership. This included cases where communication were described as "chaotic situations" with several individuals talking at the same time, issuing vague or conflicting information' (Andersen, Maaløe and Andersen, 2010). Within paediatrics, errors in communication during simulated cardiac arrests resulted in the medication orders given wrongly in 17% of cases (Kozer *et al.*, 2004).

An anonymous survey performed among paediatric trainees about communication in patient safety issues found that barriers to communication included the perceived personal safety of speaking up, potential consequences. Other factors included intimidation, individual confidence and other contextual factors including high workload (Landgren *et al.*, 2016). This study was not specific to resuscitation but highlights potential reasons for ineffective communication and lack of call-out.

Reviewing cardiac arrest teams, semi-structured interviews conducted with advanced life support instructors who attended multiple resuscitation scenarios showed several barriers to communication (Andersen *et al.*, 2010): many staff members were not aware of closed-loop communication, and when the latter was used during a simulation or teaching, it was not used during a clinical cardiac arrest situation. Another barrier to communication included team leaders overburdening team members with too much information. This information overload has been found to reduce team performance, affect diagnostic and management skills and reduce the situational awareness and cognitive skills (Høyer, Christensen and Eika, 2011). Yet another barrier was found during handover between teams with focus taken away from the patient care and compromising chest compression performance. Finally, the interviewees noted that in some cases the attempt to resuscitate was stopped by the team leader without involving the team or confirming that all therapeutic options have been exhausted with the team (Andersen *et al.*, 2010). The study had an interesting approach as it allowed observations through an 'expert' lens on resuscitation. However, it was within the Danish medical service which may have a different structure, only involved adults and was predominantly doctor-led (only 2 out of 11 participants were nurses)

Sherman et al (2018) performed a mixed-methods study on perceived barriers to effective communication in a paediatric emergency department in a US hospital and showed issues were mainly around closed loop communication, and 'deficiencies in team leader qualities' (Sherman, Chang and Nager, 2018). The study strengths are that 125 different respondents are involved from different specialities which offers a more balanced view.

The literature suggests that although communication skills are being taught during courses and simulation training, during real life scenarios they remain vague and sporadically implemented, potentially worsening the patient outcome. Specific barriers to communication have also been identified in some studies, but none involving paediatric and neonatal staff during resuscitation within the UK system.

2.3.2 Teamwork, followership and leadership

There is evidence that other human factors such as teamwork and leadership affect adherence to algorithms of resuscitation and therefore the outcome of cardiopulmonary resuscitation (Hunziker *et al.*, 2011). Both the NLS and APLS manuals describe the qualities of a leader whose role includes planning, situational awareness, assessing team performance, managing and motivating the team and allowing team members to learn and improve their work. They also advocate that the leader should be clearly identified, as this is linked with improved task performance

and teamwork (Wyllie, 2016). There should be clear indication when the leader changes. Finally, both manuals advocate the importance of a leader to remain hands off and not participate in technical activities as they run the risk of becoming task focused and lose situational awareness (Samuels and Wieteska, 2016; Wyllie, 2016).

Regarding followers, the APLS course describes the importance of followers having roles just as 'mission critical as the leader' (Samuels and Wieteska, 2016, p27). They advocate that followers should always work in tandem with the leader, but also be pro-active and not wait for instructions. Finally, they advocate that followers should communicate their concerns (Samuels and Wieteska, 2016). The NLS course advocates similar attributes, along with the acknowledgement that resuscitation teams may comprise members who are not aware of each other's skills or experience, and therefore make the team leader's task more challenging. The course highlights other important qualities of a follower, specifically the need to communicate clearly, understand the limit of their ability, remain respectful while feeling empowered to report errors or challenging certain management plans (Wyllie, 2016).

Gibbons and Bryant described four types of followers: These ranged from active ones who supported the leader but also were pro-active, to more passive ones requiring constant supervision and motivation and could take the full attention of the leader (Gibbons and Bryant, 2012). The behavioural characteristics of different types of followers and factors affecting followership in other sections can be found in Appendix C.

In the medical field, although followership as a concept has not been extensively studied, teamwork and leadership have. The performance of the team is dependent on several factors including leadership styles, leader-follower relationships and team formation, and role allocation during a resuscitation. Reviewing leadership, failures of leadership and communication breakdown have been estimated to contribute to 70% of perinatal deaths and injuries (Thomas *et al.*, 2007). A simulation study looking at leadership during the initial stages of resuscitation found that the more successful teams displayed more leadership behaviour and this in turn caused a better delegation of tasks, communication of important information and fewer disagreements and disputes within the team (Marsch *et al.*, 2004). Good leadership skills are therefore linked to better performance and by extrapolation better patient outcomes.

Who the leader is during a resuscitation remains a dynamic process: a review article on teamwork and leadership during cardiopulmonary resuscitation found that leadership 'can be distributed across team members, or be performed by different members at different times, depending on the situation and the group composition. Leadership thus has to be adapted to the situation and situational changes.' (Hunziker *et al.*, 2011). Leader-follower relationships also can have an impact on the

way the team forms around the patient during a resuscitation, and affect teamwork- indeed team formation during the critical period of resuscitation is a complex process which depends not only on the group composition, but also previous relationships or interactions between members (Hunziker *et al.*, 2011).

Team formation is an important aspect of resuscitation in the initial, but most vulnerable, part of resuscitation: a trial compared the performance of a team which had been pre-formed, to one which was adhoc: this showed that the ad-hoc team had several lapses in performance including delays in administering medication or inconsistent resuscitation techniques (Hunziker *et al.*, 2009). Role allocation is yet another important aspect affecting team performance. Indeed, a review of leadership and teamwork in trauma and resuscitation found that a clearly defined leader allocating jobs and roles appropriately to team members allowed for more effective teamwork (Ford *et al.*, 2016). This is particularly relevant, as observational studies have shown that nurses and physicians had different perceptions of their responsibilities and roles during resuscitation (Steinemann *et al.*, 2016). On the other hand, there is a risk of sticking closely to your role. Indeed, the Andersen *et al* interview study involving advanced life support instructors showed that one barrier to effective teamwork was members completing their task and sticking to an allocated role, without taking any responsibility for tasks of other groups. They report the fact that for 'many people, resuscitation means starting the stop watch and opening the resuscitation bag... They are locked in their roles, don't want to, and cannot do anything else.' (Andersen *et al.*, 2010)

While there are many factors affecting team membership, leadership and teamwork, training can improve team performance during resuscitation- Thomas *et al* performed a study comparing the performance of candidates who had received team training and those who hadn't showed that the former group had more teamwork behaviours, better management of their tasks and completed the resuscitation more quickly than the ones who hadn't received such training (Thomas *et al.*, 2010) Similar findings can be found in other studies (Thomas *et al.*, 2007).

To conclude this section, we can see that teamwork depends on many factors including followership and leadership styles. These are in turn linked to several factors such as personal qualities, previous experience, leader-follower relationship and role allocation. Poor followership leads to poor teamwork and worse patient outcomes. However, team training can lead to better team performance.

2.3.3 Hierarchy

Both manuals describe hierarchy within the team and its importance and pitfalls. The APLS manual describes the presence of hierarchy and a power gradient, with the leader who needs to coordinate and make decisions. They however also acknowledge that a balance should prevail, as a steep hierarchical structure would

make leaders make irrefutable decisions and cause blind followership (Samuels and Wieteska, 2016). The hierarchical structure should be such that leaders can invite the team's observations and concerns, particularly around patient safety. The newborn life support also reports that leaders should be able to 'listen to the team, moderate dialogue, and deal with conflict' (Wyllie, 2016).

Hierarchy is pervasive throughout many aspects of life. It is a necessary societal construct which nevertheless allows for working in groups more effectively. Indeed, Anderson and Brown describe the functionalist theories behind hierarchy. Firstly, it allows for improve collective decision-making and avoid conflict by giving excess control to one or few members of the group. This also allows to reduce the problem of having 'too many cooks in the kitchen' whereby there are differing opinions and delays in decision making (Anderson and Brown, 2010). Hierarchy is also felt to improve the quality of the group decisions- control is usually given to the most competent or experienced individuals who are thus more likely to make better decisions. Finally, hierarchical structures may help motivate the group to achieve their goal- higher rank is allocated to members who contribute to the group's goal, who can then move up the hierarchical ladder. This provides everyone an incentive to perform to the best of their capacity(Anderson and Brown, 2010).

Although the manuals describe the ideal hierarchy whereby teams have a definite leader who will take important decisions but also empower staff and promote discussion, a literature review of hierarchy within medicine leads to some interesting observations.

Interest in hierarchy during critical scenarios has increased after a high-profile case within the anaesthetic community in the UK. A patient died from severe brain injury during a routine anaesthetic procedure. The case highlighted significant breakdown of communication and human factors, including the failure to challenge hierarchy and authority (Bromiley, 2015). As such studies looking at challenging hierarchy have been carried out, with mixed results.

Firstly, a cross-sectional survey of staff attitudes regarding hierarchy was carried out. This showed that steep hierarchies were rejected by 94% of intensive care staff, but only 55% of consultant surgeons. Furthermore, when asked whether junior team members could question decisions made by senior team members, almost 20% (122 out of 720) of staff reported that junior members should not do so, with a higher proportion associated with increased seniority. This is in contrast with only 2% of pilots who were asked the same question. (Sexton, Thomas and Helmreich, 2000) The results of the study highlight 2 aspects: firstly, the preferred hierarchical structure varies between specialities. Secondly, the more senior doctors were less likely to accept criticisms to their management plan.

Another study looking at the effects of hierarchy and teamwork was carried out within simulation scenarios. In one study by Sydor et al, trainees were asked to give blood

to a Jehovah's Witness by their senior, in contradiction to the patient's wishes. The scenarios were run in two ways- one simulating a steep hierarchical model, the other within a non-hierarchical model. The researchers found that both groups had high rates of checking and administering (2013). Trainees interviewed reported a steep hierarchical structure being present in their clinical care setting, pervasive throughout and part of the hidden curriculum during their undergraduate and postgraduate training. They also reported that the level of experience, their gender, whether they were locally trained or foreign doctors, and the composition of the team were key factors of their position within the hierarchy and whether they could confidently challenge figures of authority. For example, they felt that local trainees who were more senior and male were more likely to have their opinions accepted by the team. Trainees also reported that they were taught through informal conversations and exposure to the theatre environment that their opinions were not valued and not to create problems for themselves by reporting concerns (Zeev Friedman *et al.*, 2015).

They therefore resorted to coping mechanisms: the first one was avoiding conflict and not challenging authority. The second coping mechanism was that of 'diffusion of responsibility'- many trainees felt that even though they had physically given the blood themselves in the scenario, they felt that they were just doing what they were being told and that someone else had made the decision, thus taking a passive follower approach to the scenario (Zeev Friedman *et al.*, 2015). Another study by the same team focusing on a simulated airway emergency reported similar findings whereby trainees were not able to challenge their seniors effectively (Z. Friedman *et al.*, 2015). Similarly, healthcare providers have reported the barriers a steep hierarchy imposed on communication- a interview study done in focus groups in a neonatal intensive care showed that hierarchy was 'embedded in title, not expertise' and that nursing staff were frustrated by the perceived hierarchy of a junior doctor having more power than an very experienced nurse (Thomas *et al.*, 2004). Yet another interview study on 50 doctors showed similar findings, including the fact that a steep hierarchy is often observed and respected by trainees from undergraduate training, trainees not wanting to challenge seniors due to fear of their careers being obstructed, or fear of humiliation and intimidation. (Crowe, Clarke and Brugha, 2017)

It would therefore seem that, whether the hierarchical structure is seemingly flat or steep during a resuscitation scenario, many other factors determine the actual hierarchy, including work environment, team composition, personal qualities of the leader, and interactions between other specialities. Indeed, while there exists a vertical hierarchy within a speciality, there is also a horizontal hierarchy across different specialities: Srivastava describes a memorable case where a patient with cancer is taken for palliative surgery and both the author and the operating surgeon separately believe that the patient is not a good candidate for such invasive procedure. However, none of them discussed the case, as they gained the perceived assurance of the other, preferring not to challenge another's viewpoint (2013). It is clear that hierarchy can be a significant barrier to good teamwork at all levels.

Exploring followership, hierarchical structures and barriers to effective communication during paediatric and neonatal emergency situations and resuscitation in district general and tertiary hospitals in the United Kingdom: a qualitative study.

A small simulation-based study within paediatric intensive care and paediatric emergency medicine tried to replicate a hierarchy-related error to assess the response of trainees. The simulation faculty deliberately precipitated an error and trainees had to address and correct it. In 80% of cases, the team were unsuccessful. (Calhoun *et al.*, 2014)

The studies reviewed show that hierarchy can have a significant impact on communication, teamwork and performance of the team (Palanisamy and Jenkins, 2015).

2.3.4 District general vs tertiary care

When considering the difference between district general and specialist hospitals, it is important to understand the context. Within the UK there was a reconfiguration of services in trauma care in 2012 whereby major trauma centres were set up and ambulances would bypass local hospitals in significant injuries. This showed that there were significant improvements in treatment systems and outcomes of patients (Moran *et al.*, 2018).

When we consider paediatrics, a retrospective review of outcomes of children having had cardiac arrest was performed, comparing paediatric emergency departments(ED) to General ED. This again showed that the survival of patients suffering from cardiac arrest due to medical causes in a specialist paediatric ED was higher (33.8% vs 18.9%). The authors also found that patients in the paediatric ED were more likely to receive specialist invasive treatment including ECMO (a type of heart and lung bypass device), haemodialysis and mechanical ventilation. The improved emergency and post arrest care therefore accounted for the better outcome for these patients (Michelson *et al.*, 2018).

Within neonates, a retrospective study was performed looking at the survival rate of very preterm babies- this again found that infants had improved survival if they were born or managed in neonatal intensive care unit(NICU) which had high-volume neonatal care (S I Watson *et al.*, 2014)

While it is evident that patient outcomes are better in more specialised unit, the specific reasons for that are less clear. The most obvious would be with high volume of cases and increased exposure: this reflected in the findings of a survey based study in a district general hospital, where only 10% were involved in full cardiopulmonary resuscitation in the preceding 6 month period and only 30% had been involved in an airway or breathing emergency (Saeed and Joishy, 2015).

2.4 CRITICAL CONCLUSIONS

It can be seen that although there are differences in paediatric, neonatal and adult resuscitation, they nevertheless share similar concepts in terms of communication,

teamwork and hierarchical structures. We also reviewed that although communication skills are being taught, they are not retained and used in real life scenarios, and there were multiple barriers to good communication within a team during a cardiac arrest. This was similar for team working skills, i.e. there were characteristics of followers which depended on personal attributes, the type of working environment and the leadership and this had an impact on team performance. We also reviewed how hierarchy was a barrier to effective communication, and what factors affected it as well.

3. METHODOLOGY

3.1 RESEARCH PARADIGM AND ENQUIRY APPROACH

This study aims to gain an understanding of the behaviours, attitude and relationships within a team. Qualitative research allows greater freedom in exploring these concepts and seeking new directions based on data already obtained; it is therefore the most appropriate form of research for this study (Gessaroli and McKinley, 2018). The research paradigm chosen is a critical theory approach. Indeed, while studies in the past have focused on the leaders, the current approach would be to focus on the voices that are rarely heard, namely midwives, nurses and more junior doctors, along the more dominant ones such as senior consultants, and while this study is an exploratory one in scope, its results may help bring about a change in the way training occurs during simulation of paediatric or neonatal resuscitation (Anshu and Grant, 2018).

When considering the approach to enquiry, an inductive approach will be taken, i.e. this is where data obtained from interviews help generate a pattern, which then leads to a tentative hypothesis and finally a theory is made (Anshu and Grant, 2018).

3.2 DATA COLLECTION METHODS

Different qualitative data collection methods exist: some collection methods may seem more desirable during the discussion, but would not have been feasible or acceptable within the restricted schedule of the study (three months from time of study approval to end of data analysis). A full discussion of the various data collection methods including their pros and cons is found in Appendix D.

The method chosen was a semi-structured interview. This maintains the flexibility offered by asking follow up questions, and balances it with structured questions to focus on the research questions (Gillham, 2005). A face to face interview was preferred to a telephone or video call interview due to the concern of losing cues and non-verbal communication aspects to the interviewee's responses. Moreover, a review of the ethical committee highlighted that non-verbal behaviours and

responses may be missed during telephone interviews, and may exacerbate the moral distress of participants.

The interview was audio-recorded using a recording device and notes were taken as a precautionary measure in case of equipment failure. This was to ensure no verbal data was lost during the interview- while this caused some reluctance in some participants being consenting, they were reassured by the data storage arrangements, and appreciated the fact that the interview flowed like a conversation without frequent interruptions of taking notes(Gillham, 2005).

The interview itself would be broken into three parts. The first part would be for the participant to describe in their own words a real-life scenario which was memorable to them, ideally where they felt matters could have been improved. They would then be prompted to describe certain aspects of the scenario itself. The second part would be a combination of their demographic and experience details such as age, gender, years of experience and confidence level in resuscitation, leading arrests and call outs. They would also be encouraged to describe the follower type they tend to be. The third part of the study would explore their general thoughts regarding the research questions, but also include questions derived from analysis of previous interviews using a grounded theory framework (Stewart and Filice de Barros, 2018).

3.3 SAMPLING

The aim of the study is to obtain the perspectives of the main stakeholders, especially followers, during resuscitation. I therefore carried out a non-random purposive sampling, aiming to interview participants from different ranks, experience and profession namely midwives, paediatric nurses, neonatal nurses, paediatric consultants, neonatal consultants, paediatric junior doctor, paediatric senior doctor, emergency medicine doctor, anaesthetic doctor and nurse practitioner. My aim was to obtain the view of at least one in each specialty, accepting that the scope of the study would not allow me to reach theoretical saturation.

While doctors tend to rotate every six to twelve months between different hospitals, midwives and nurses usually stay in permanent jobs in the same unit. Hence, during the planning phase, I discussed with my peers and realised that there was a reluctance from nursing and midwifery team to participate in the study if it was limited to one site as they felt that, despite my assurances, they would be easily recognised when the interview results were published, thus breaking anonymity. I therefore had to expand the sites to include other hospitals and other units so as to minimise that risk. I immediately noticed that participants were visibly reassured and more willing to consent to the study when I explained that I was sampling from different sites. The final sampling occurred across 11 different sites detailed in Appendix E.

Information leaflets given up to two weeks prior to the interview encouraged them to recall and reflect on their experience of resus scenarios and help minimise recall bias.

A retrospective study was preferred for 2 reasons: firstly, resuscitation scenarios are rare and unpredictable, and people enrolled in the study may not be exposed to it within the 3-month period of recruitment and data collection. Secondly, and more importantly, we have to consider the 'emotional readiness' of participants to accept being interviewed for such a study- indeed some participants may not want to talk about any resuscitation scenario soon after it happened and may need days or weeks to process and reflect on the experience (Kessler, Cheng and Mullan, 2015). So, while a retrospective study has the problem of recall bias (whereby participants may not remember exact details of a resuscitation which occurred months ago), they would have had time to reflect on it and be more emotionally ready for the interview.

3.4 INTERVIEW SCHEDULE

The interview schedule was developed based on the study aim and research questions. A mind map was created with the subject topic in the middle (resuscitation) and broad themes expanding from the central topic (communication, followership, hierarchy). Within those themes, specific questions were designed with specific consideration of preventing leading questions which may introduce my bias into the study. The questions were refined and a logical order was determined to ensure a smooth flow of the interview and prevent confusing the interviewee with sudden changes of themes (Gillham, 2005).

A pre-piloting stage was undertaken- this is where critical feedback is obtained from the respondent, akin to an 'experimentation' of the interview schedule (Gillham, 2005). The interview schedule was first discussed during the FAIMER Masters Course Residential with the course director Prof Janet Grant and questions changed to be more open-ended and thus encourage deeper exploration of themes. A revised interview schedule was then shown to my supervisor Dr Anthony Errichetti who encouraged the use of follow up questions to further explore those themes, and allowed the schedule to become more focused and prevent exploring themes not being considered by the research questions. A narrative structure to the interview was designed to further improve the flow the interview process.

That revised interview schedule was then used as a pre-pilot interview with Dr Lorna Gillespie, who is a senior neonatal consultant with interest in research. She gave me feedback on the questions and we agreed to hold a focus group within the neonatal unit with doctors and nurses to ensure the acceptability of the questions- one of my main concerns was the extent to which interviewees would be comfortable discussing themes such as challenging authority or examples of bad teamwork. Overall, it was felt that the questions were acceptable and not morally distressing.

I then piloted the interview schedule, with the aim of ensuring that the interview would not last longer than 1 hour, due to time commitments of professionals, and the fact that deeper interviews are likely to be more exhaustive for both parties (Gillham, 2005). After 5 interviews, I noted that not all interviewees had a significant memorable encounter to discuss in depth, especially the more junior ones. This was surprising to me and indicated either that these events hadn't occurred in the interviewee's experience, or that they didn't want to mention these scenarios. I therefore designed a third section which were more general questions (not related to the scenario) which would allow me to still explore my research questions. I also expanded the section to ask questions based on thematic analysis of previous interviews (Noble and Mitchell, 2016). The final interview schedule is noted in appendix E.

3.5 ETHICAL CONSIDERATIONS

The ethical principles for educational research are described in detail in Appendix K (Hammersley and Traianou, 2012).

The study received ethical approval as detailed in appendix G.

3.6 LOCAL APPROVAL AND GATEKEEPERS

Once ethical approval was obtained, I also required approval to conduct the study. Due to the nature of the study involving medical and nursing staff, I required approval from the health research authority (HRA) (appendix J), and subsequently from the local trusts research and development teams (Health Research authority, no date). This was an additional time that I had not factored within my Gantt charts and that I had underestimated.

Once local approval was obtained, I initially published some flyers which were placed on the unit and sent a group email to all the staff involved. However, I did not receive significant responses. I then realised that I would need to promote my study through the use of 'gatekeepers'- people in positions of leadership who would vouch for my study being useful and thus encourage their staff to consider my study (Stewart and Filice de Barros, 2018). Following that the response rate was much higher.

3.7 DATA ANALYSIS

As the literature review showed a relative lack of studies on my study research questions, a grounded theory framework was adopted to generate theories to explain the followership, hierarchy and barriers to communication (Noble and Mitchell, 2016).

The first step of data analysis is transcription, where a written record of the interview is carried out. The interviews were transcribed by myself as it allowed me to

familiarise myself with the data, adhere to the data governance rules of my local hospitals, prevent poor interpretation from an outside transcriber, maintain a standardised punctuation and layout and was more cost-effective. This also allowed me to be able to paraphrase and edit the account where required and reduce the data, but retain its meaning allowing easier analysis afterwards (Gillham, 2005). The transcript was then coded and themes and significant statements derived from them.

Inductive analysis was carried out, with constant comparison of the transcripts to identify themes, and then going back to the previous transcripts with that new knowledge to identify areas of interest. Constant comparison is a technique specific to grounded theory framework

A thematic analysis was carried out when trying to identify factors affecting communication, followership or hierarchy, and a stage structure analysis was carried out when trying to determine who the leader was during resuscitation.

Some examples of coding are given in Appendix L.

The demographic details simply aim to describe the data in more detail to ensure that the study captured the breath of situations where paediatric and neonatal resuscitation occurs.

4. RESULTS

4.1 DEMOGRAPHIC DETAILS

24 people were interviewed and 57 resuscitation scenarios were reviewed. The demographic details are described in more detail in Appendix N, including the proportion of cases where there were issues with communication, teamwork, leadership and hierarchy.

From the interviews I derived the themes described in the next section. The participant codes used for the quotes are described in Appendix O.

4.2 COMMUNICATION ASPECTS

4.2.1 Barriers to communication

The barriers to communication were divided in 3 categories:

4.2.1.1 *Intrinsic Factors*

These were factors present within team members in isolation: the first one was the experience of the team member: an inexperienced team member was likely to experience more barriers to communication according to two participants.

Secondly, a soft, quiet voice made following tasks harder, as reported by a nurse: *'The only negative thing [about the resus] was that the registrar was quietly spoken which makes it hard to hear what he said'*(NN15). This was also a factor noticed by a doctor: *'I am aware of my voice being quite soft spoken, and I have to talk myself to be stronger and talk more loudly'*(PD12). Participants commented on the fact that a *'loud booming voice'*(PD5) made communication clearer, although this could sometimes lead to *'too loud a voice'*(PD13) which was distracting. The person's accent was also mentioned as a factor, and a midwife noted that *'I think sometimes there's a language barrier with some of the junior doctors'* (MW19).

The final intrinsic factor, according to a nurse practitioner was that *'sometimes it's just down to personality. Some people are better at it, simple as...'*(NP16). Another neonatal nurse commented on how *'I think in life, I'm more passive...'*(NN6). This was also observed by a senior paediatric trainee when discussing team interactions: *'the behavioural characteristics of paediatricians are generally more of a 'people people', liking to be nice to each other; it sounds stereotypical, but we don't tend to be competitive and aggressive in the same way you might expect a surgeon to be'*(PD4). Voice and personality may be intrinsically linked and impact on communication, and it seems likely that paediatrics and neonates preferentially attract a certain personality.

4.2.1.2 Situational factors

The first situational factor reported by 8/24 (33%) of participants was the stress associated with high stake resuscitation of children causing impairment in communication. This was also felt to be one of the reasons closed loop communication was not always practised in real-life scenarios, as a paediatric nurse stated: *'I think sometimes people don't process that you've said it even if you say it loud, because they are stressed themselves'*(PN9). Stress also impacted on the way interprofessional communication was carried out- a neonatal nurse commented on a particular incident: *'The registrar was obviously stressed at that point and her communication was just short and sharp. There was not a lot of two-way flow.'*(NN15) The environment in which the resuscitation took place could amplify stress: Neonatal staff members doing resuscitation in *'accident and emergency departments, or a car park'*(NP16), found this more stressful, as did rotating paediatric trainees as they often had to go *'to a place where you're not particularly well known, or know the staff or equipment'*(PD2).

Another situational barrier to communication was task fixation. During stabilisation of a sick child where one equipment had failed, a paediatric registrar observed that *'[the first team] were fixated on getting their machine working: a nurse in our team asked if they wanted the baby connected to ours, but the consultant was fixated on [their] machine and the settings of the ventilator'*(PD3). Another paediatric consultant offered this reflection of her own practice: *'I was distracted into doing something and fixated on that, and when something major happened and people tried to tell me about it, I didn't hear it'* (PD5). Task fixation could be perceived by other team members as *'shutting off'* (PD20) or being *'quiet'* (NN15).

Parents can have a significant impact on communication during resuscitation. Firstly, parents can be understandably upset when their child is critically unwell. This feeling is even more pronounced in a neonatal setting as there is surprise or shock associated with their newborn baby being unexpectedly unwell at delivery. Some interviewees reported that parents can be so upset as to be intrusive to the process of resuscitation. When asked whether the mere presence of parents had an impact on communication, the opinions were mixed.

Five participants felt that communication was not affected by the presence of parents, stating that the team was usually focused on the task and *'in the own little bubble'* (NN6) and almost ignored the parents. Another reason given was that most patients were usually grateful for the resuscitative efforts and would *'step back and let you [work]'* (PN11) thus causing minimal disruption. One participant even felt that parents had a *'positive impact- people generally talk calmly because parents are present and try to remain calm'* (NN6), thus making the situation more controlled and seemingly less stressful.

However, most other interviewees felt that communication was impacted by the presence of parents. While discussing the scenarios, many interviewees described their anxiety around the fact that parents could observe the resuscitation and have their own perception of what was happening. For example, a neonatal nurse's thoughts about a resuscitation going poorly: *'Luckily mum had a general anaesthetic so she didn't know what was going on... it must be so scary for parents'* (NN7). Another nurse expressed how her communication was modified in the presence of parents: *'It's stressful... the other aspect was mum could hear everything, so obviously I am aware of how I sound and the tone of your voice, and people do pick up a lot'*(NN15). As a result, participants felt they could be more *'vocal'*(PD13) or *'more blunt'*(PD21) when parents were not observing them. Parents also had an impact on the way members approached stopping resuscitation: a paediatric registrar described a scenario where resuscitation was continued, inappropriately in her view. When asked whether anyone else in the team voiced their disagreement, she replied *'no one said 'Should we stop?' The stressor is you've got parents nearby and you don't want to look like there is discord amongst the staff...'*(PD22). There seemed to be great thought placed in making sure parents were satisfied that

everything had been attempted on their child, and the realisation that resuscitation could have a therapeutic effect on the parents' long term memory of the care received: *'Sometimes you go through the motions of resuscitation for the parents sake, even if you know realistically, this probably isn't in the child's best interest... we don't always do things that are in the best interest of our patients because you're caring for the parents as well.'*(PD22) Other interviewees expressed similar opinions of being more open in their discussion about stopping treatment when parents were not present- another paediatric trainee offered *'I think it would have been inappropriate for the parents to hear [us discussing withdrawing]. It would have sounded like the person in charge wasn't sure 'Is everybody happy with it?' It may undermine the decision that was being made.'*(PD20)

4.2.1.3 Team factors

Observations by several participants showed poor communication in big teams. This was compounded by the fact that people did not know each other in those settings. One paediatric registrar offered their experience of activating an emergency call and the communication following that: *'We put out the crash call. It was like 30 people in the room and it was just chaos. You couldn't even hear yourself anymore... it was really counterproductive because it just created noise. It was difficult without knowing the names of the people who to direct instructions to.'*(PD2) This was particularly prevalent in paediatric emergencies as compared to neonatal emergencies where the teams are often smaller and members tend to know each other due to less specialties being involved (in the UK, anaesthetists or emergency medicine doctors are rarely involved in neonatal resuscitation).

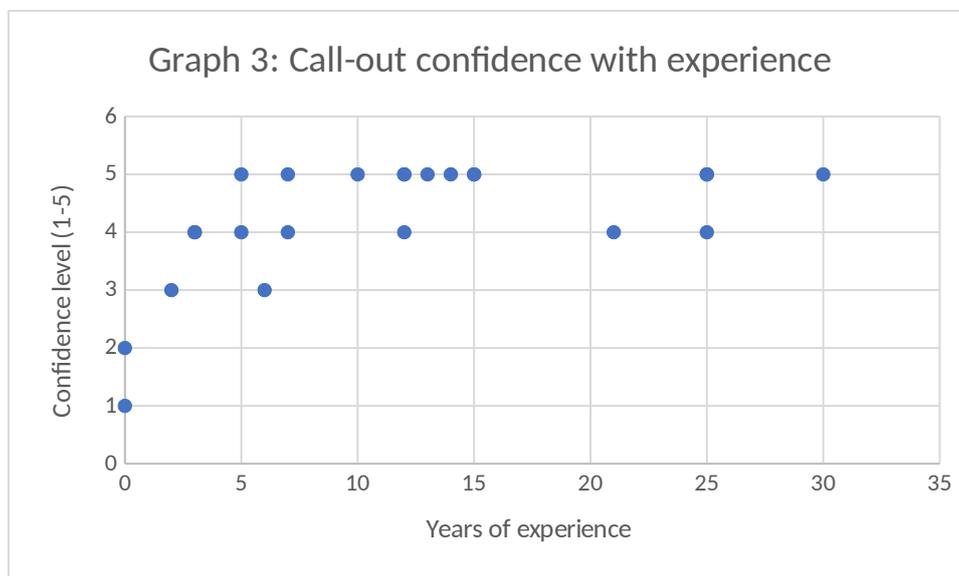
Another way team composition was a barrier to communication was due to prior working interprofessional relationships; one paediatric registrar observed that *'I have known [communication] to be difficult where the nursing and medical teams do not get along particularly well on a day-to-day basis and know this has been awkward for some people'*(PD21).

4.2.2 Factors affecting Call-out and Challenging decisions

During the study, specific attention was given to 2 critical situations where communication is important: call-out and challenging decision making. Call-out can be defined as a method to communicate critical information(King *et al.*, 2008). During the interviews, junior members of staff were not aware of this definition and examples of call-out were given, such as informing the team leader if the oxygen levels were worsening, or if a procedure had been unsuccessful (e.g. endotracheal tube). Their confidence to do a call-out was reviewed on a Likert scale (1=not

confident, 5= very confident) and barriers to call-out were elicited. The fact that call-out was not well known to some members of staff was a significant finding in itself.

Graph 3 shows the relationship between call-out confidence and years of experience. As can be seen, the majority of interviewees with more than 5 years of experience felt quite confident in doing a call-out. A junior nurse reported: *'I've not got enough experience to really identify when something is going wrong at this stage.'*(PN11) Many interviewees also corroborated the fact that they felt more confident doing call-outs as they became more experienced, as stated by a senior neonatal nurse: *'My knowledge has been consolidated over the years and experience: the more situations you do, the more competent you get'*(NN15)



Simulation training also helped improve confidence in doing call-outs: a paediatric registrar explained that their call-out skills improved after observing it within a simulated scenario: *'One of the big things that's helped me [to do call-outs] is doing simulation. Whether that's been witnessing other people doing it and seeing how it works and what effect it has.'*(PD21)

Another factor impairing ability to call-out was if they had previously had a bad experience during a call-out, which had an impact on their confidence. A nurse practitioner reported: *'People can be quite obstructive and some are very defensive when challenged... I remember saying to someone quite senior, your mask technique isn't right, you're not getting the pressures... they didn't enjoy that, they didn't like being told'* (NP16). Conversely, another nurse had a more positive experience after a call-out, reinforcing her confidence: *'Sometimes they welcome*

your opinion as well. I've been thanked in the past that I've said something, therefore I think it's a good idea' (NN8).

Parents had an impact on call-outs. A midwife recalled a scenario where inappropriate resuscitation techniques were being performed on a neonate and described: *'I couldn't shout and be like 'That's wrong' across the table [in the theatre] because that would just worry everyone.'*(MW18) Other participants echoed the sentiment of not wanting to worry the parents and raising the anxiety and stress levels in the room as a result. They reported that they would try to employ other strategies to do a call-out, being less vocal to prevent parents from hearing by *'going to speak directly to the [leader]'* (PN9). There was also a concern that by calling out or challenging a decision made by a team member, parents would lose trust in the ability of the team. A junior paediatric trainee's thoughts were: *'would [the presence of parents] affect call-outs? Possibly... You don't want to undermine someone; you want the parents to have the confidence in the ability of a team leader.'*(PD24).

Many of the interviewees felt that during resuscitation, they would do whatever was the *'child's best interests'* (NN8), and they felt confident in doing call-outs without worrying about the impact on the team member. Others were more cautious. They felt that it was sometimes hard to do a call-out without sounding confrontational or obstructive. They also felt that doing a call-out in a stressful situation had the potential of undermining that particular member's confidence, as reported by a senior midwife: *'I just don't think it can help people's confidence, ...if they're trying to lead it, it's then reducing their confidence if you then criticise everything'*(MW19) Interestingly, when we enquired what participants' experience had been regarding being called out, they were happy of having been told that information at the time. There is certainly a difference between the perception of members and the reality of being called out.

Junior members also felt that if their call-out hadn't been listened to the first time it was stated, they would less confident in stating it multiple times.

Thinking of the wider team, the team composition had a definite impact on participants' confidence. Within neonates, all members self-reported themselves as confident in call-outs. The reasons given were communication being part of the unit culture, as reported by one of the senior midwives: *'I think it's just how we operate as a unit. Because the team got on so well you feel comfortable to voice your opinion... that does really help in emergency situations.'*(MW18) The neonatal nurse practitioner also felt that she had good rapport with everyone on her unit: *'I have a really great rapport. That is definitely one of my strengths ... I don't feel there's anything that I couldn't say to them'*(NP16). Conversely, call-outs were less frequent in settings where multiple unfamiliar members met, or when staff changed into their new jobs: *'It can be difficult with the rotation of medical staff. They don't know our experience and we don't know what their experience is. So sometimes I might say 'I'll get the registrar for you' sooner rather than later, or ask 'do you mind if I try the airway for you?'*(MW17). Not knowing team members made it difficult to gauge level of competence and when to do a call-out.

Most interviewees felt that the team leader was a major factor in doing a call-out. Their confidence would vary based on approachability, communication skills and attitude of the leader, as evidenced by the following:

'I think it would depend on who is leading it- some staff are more approachable and if I had any concern, I would be happy to report to them, but others that I'm not sure whether they would be like 'whatever' and dismiss it'(PN11)

'[The registrar] shot me a look and was quite short. The communication that was given back to me wasn't an environment where you felt you could challenge it if you were junior' (MW17)

'I think [the team leader] setting the expectations and empowering the team, and demonstrating your confidence to the whole team, that it doesn't matter what they say, you'll have an answer for it.'(PD4)

Finally, hierarchy had an impact on call-outs. Indeed, participants expressed reluctance to question decisions made by their seniors, adhering to a social hierarchy. A paediatric registrar commented: *'I think I would be less likely to [call-out] if it was regarding a consultant, because that is a hierarchy thing because you're questioning their management and competency.'*(PD22) A senior midwife also recalls an incident where she felt inappropriate resuscitation was taking place but didn't do a call-out: *'I think I was very junior at the time, and I felt they were the doctors who had been called for a resus, so they should know what's happening and what they're doing. That was quite hard.'*(MW18)

Table 1 summarises the factors affecting call-outs:

Call-out more likely	Call-out less likely
Experienced	Junior/Inexperienced
Prior positive experience	Prior Negative experience
Simulation training	Presence of parents
Familiar team	Fear of undermining colleague
Unit culture encouraging open communication	Authoritative leader
Approachable leader	Adhering to Hierarchy

While we discussed several factors impacting call-out, it is important to note that most staff interviewed felt confident in performing that time-critical skill, with 20/24 feeling confident. Midwives and neonatal nurses were especially confident in performing call-outs with the rationale being that timely intervention improved outcomes. Within paediatric practice as well, doctors observed that nursing staff were generally quite good at calling out abnormalities or lack of improvement during resuscitation: *'I think paediatricians work for the child and take their egos out of it and a nurse wouldn't be scared to speak up to a consultant in a resus...'* (PD20).

4.3 FOLLOWERSHIP ASPECTS

Within this section, we will discuss the emerging themes from the interviews focusing on followership and teamwork. Followership and leadership are intertwined and will therefore be discussed. We discuss a stage structure analysis showing the followership profile of junior and more experienced team members, followed by factors affecting active followership.

It is important to remind ourselves of the different types of followers described in our literature review in Appendix C. For the purposes of the study we focused on active versus passive followership as we found no participant reporting themselves as alienated followers.

The first observation was that less experienced staff members were passive followers, whereas more experienced staff members were more likely to hold active roles or become leaders. A detailed account of that including quotes from participants is found in Appendix P.

We then discuss the factors affecting active followership.

4.3.1 Factors affecting active followership

4.3.1.1 *Personality and experience*

Members with less experience were likely to hold a passive role from a followership framework. Another factor was the team member's personality-some interviewees admitted to being more passive in general. A senior paediatric doctor stated that they rarely took an active role, preferring to be in the side-lines- *'I'm not a confident person, I'm sort of a Hermione Granger type character, [thinking more] rather than being more active. I do a lot of courses and attend simulations, but I think those [resuscitation] scenarios are intrinsically disturbing... I have been taught how to do them, but on the other hand as a person I don't like leading'* (PD5).

Another emergency doctor observed that *'within [paediatrics] you have a range of doctors. Those that are more interested in your community [and outpatient] and not your tertiary care or acutely unwell patients. We generally we fall into a step back and step forward nature. For A&E, I think you have to be a step forward. If somebody's not well, you will step forward and say 'what can I do?' Other people find that very stressful and they step back and say I want somebody else to step in front of them. Many specialties define themselves into 'I am this type of doctor' in general. Whereas I think [in paediatrics] you have everything because there are so many branches within it still and therefore when you're still training I've met registrars you feel incredibly comfortable in that situation.'* (ED23) It is indeed true that within the paediatric training which lasts 8 years in the UK, trainees with different personalities and interests may be involved or required to take active roles in a resuscitation- their intrinsic personality to deal with emergencies may be a barrier to them being more active.

4.3.1.2 Exposure, paediatrics versus neonates, lived experience and debriefing

Another factor impacting on followership was their exposure to that particular scenario- if they had been involved in a similar scenario before, through real-life or through simulation training, they were more likely to hold a more active job- for example a junior paediatric nurse having done chest compressions in one resuscitation reported she would more likely volunteer to do that in a future scenario. Some participants felt confident in doing procedures or volunteering to do tasks only after having done them during a resuscitation previously. *'I would do the chest compressions again if I had to. I have had experience doing ventilation, bagging and saline, but I don't know how confident I would be in that minute, [and whether I'd volunteer]'*(PN10).

During the study, we noted that more people were less confident in paediatric resuscitation than neonatal resuscitation- 7/15 (46%) reported a confidence of 3 out of 5 or lower, compared to only 4/21 (19%) in neonatal resuscitation. An explanation was offered by an experienced paediatric registrar- *'I think in neonates there's actually less stuff that goes wrong, so I'm more confident in neonates, as compared to paediatrics where you have seizures, asthma, trauma etc.'* (PD2) Therefore the fact that neonates have limited range of pathologies, team members are rapidly exposed to them and become more confident in managing them.

How a resuscitation is experienced also has an impact on followership. A nurse practitioner recalls her experience of having had poor teamwork and communication during a particular resuscitation and being affected by it for a while, impacting on confidence and how she approached subsequent scenarios: *'I've never been doubted in that way. I had major issues with this for months afterwards... It's really unnerving'* (NP16). A neonatal nurse recalled another scenario where a more junior member was affected by the resuscitation and did not want to participate in any subsequent ones: *'the junior nurse was very upset at that point and she was crying- really out of control. It was the first time that she had seen a baby dying here'* (NN8).

One of the factors which in turn impacted on someone's lived experience of the resuscitation was a reflection or more usefully a debriefing. This allowed the team member to clarify their doubts about the resuscitation and to explore the technical and non-technical aspects to reduce anxiety and for education. *'[During debriefing] you could maybe raise a point there and hear what people say, because a junior might think we should have done something and there might be very good reason why we didn't. So, if they raise it in a non-stressful, you know after the fact reflecting on things then they might learn and be able to contribute for the next resuscitation.'*(PD20)

4.3.1.3 Team factors: size, role allocation

Other factors related to the team size and role allocation. Bigger teams were more likely to create passive team members. Several reasons were given: participants knew there were more skilled team members performing tasks: a midwife described

how the arrival of the neonatal team changed her role: *'I've been to arrests where there's no one else. I've started compressions and done airway, but when other people arrive, I do think I become more passive and that I would then be looking at someone else for suggestions'* (PN9).

Another reason was related to poor role allocation during the resuscitation- one example being a paediatric resuscitation involving multiple teams where *'there was not a clear plan, and a huge delay in getting a second access...'* (PD5). Poor role allocation itself may be related to different factors- the first one being lack of briefing prior to resuscitation: *'I don't recall [the doctors] coming and having a discussion about what our roles would be. I feel they took for granted what our role was... what we were expected to do... it's not a normal thing for us'* (NN8) reported a nurse when severely preterm babies were born unexpectedly. Similarly, in unexpected emergencies, the same situation would arise with no clear role allocation being carried out. Even in cases where a team briefing is carried out, role allocation may not be clear: *'we talked about it briefly, but not as specific as what I had done with others'* (NN15). Finally, it may be due to team members not showing themselves to be available to their team leader and actively asking for tasks- *'I can see you are the leader here. What's happening and what do you want me to do?' I think people including myself are nervous about asking or don't know how to'* (PD1). In that way without a clear role, team members may remain passive throughout the resuscitation.

4.3.1.4 Team members' arrival time in resus

If team members were present from the beginning, they were more likely to have attended a briefing, but also to have followed the resuscitation and have a better idea of the tasks that had been done or were outstanding. Conversely team members joining in the middle of a resus would feel lost and depending on their role may or may not have a handover of care, thus impacting on how helpful or active they could be -*'I got called at five minutes... the baby to me was pale, wasn't breathing and didn't seem well... there was no handover to myself, so I didn't have a clue of what was going on'* (NN7).

4.3.1.5 Leaders' characteristics and clear leadership

Scenarios where the team leader was approachable ensured team members were comfortable and able to contribute to the resuscitation effectively. On the other hand, an intimidating leader or overly authoritative one caused team members to slip into a passive or inefficient mode: *'Some people can just get intimidated and might just get stressed, you would have one member team in a difficult situation who might just help but because of the stress might just not be able to perform to the best.'* (PD12). This is mirrored by the experience of another doctor: *'Actually I was quite intimidated by the registrar as well...I didn't feel I could ask for help.'* (PD24). In cases where followers find the leader unsupportive, they would usually try to look for other

supportive members: a junior nurse's experience: *'You think of your team leader, and if they are not supportive, you look at who's around you and you hope that whoever's around you will be supportive...it sounds harsh to say, but in all honesty that's how it feels sometimes.'* (PN11)

From a follower's perspective, situations where the leader was not clear sometimes caused team members to be less able to contribute to the situation and who to direct questions and thoughts: speaking of unclear leadership, *'it didn't feel well led. There wasn't any game plan.'* (PD1). Nursing staff also reported of their experience when there wasn't a clear leader: *'I felt it was controlled but I don't think there was someone taking a lead role to say 'can you do this? We're going to give adrenaline. Can you give a fluid bolus?'* (PN10). And speaking of co-leadership (discussed in next section), one of the nurses reported: *'It makes it difficult sometimes to know who you're looking at for sort of leadership. You want to be able to just look at that one person.'* (PN9)

4.3.1.6 Environment created by other team members

Interviewees described how supporting others during resuscitation led followers to become active: an emergency doctor's account of supporting their junior during an arrest: *'I had one [junior] who had never been in a resus before in one of my cardiac arrest scenarios and I could not do airway [myself]... so I said, is there any chance you can manage...? I saw in his face instantaneously that he'd never done that before; I took two minutes out of my time to teach him and to tell him exactly what to look for.'*(ED23). Some more experienced paediatric nurses also encouraged their juniors to participate in a resuscitation: *'If I speak to a new starter, I remember telling them at arrests if they feel like they're not doing much to draw up flushes, to make them feel like they are involved'*(PN9). A more junior nurse also recalled how she was encouraged to become more involved in the resuscitation: *'Because I was newly started one of the [senior nurses] asked whether I wanted to do the chest compressions'* (PN10).

4.3.1.7 Shared mental model

The presence of a shared mental model made active followership more likely as every team member had an understanding of what had happened, and what needed to be done.

The participants described cases where shared mental model was not present within the team impacting on their ability to contribute:

'I don't know what it was like for the [consultant anaesthetists], could it be that they underestimated how poorly the child was... I question myself how critical those inotropes were as clear to the anaesthetist as they were to me' (PD5)

'We did have chest movement, and I just didn't feel that the doctors were as worried as maybe I was, unless I'd got the wrong picture' (NN7)

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'I asked [the junior doctor] to call the [senior team] and he didn't want to do it. He didn't think the baby was unwell enough and I thought so.' (NN8)

Cases where the shared mental model was present seemed to run more effectively, with clearer task delegation and role allocation:

'We thought she would arrest again and we got the fluids and adrenaline ready. She looked an awful colour and we knew that she was just too sick.' (PN10)

'That was through her communication or asking other people for their opinion and quite often pause to see what everyone else was doing. That ensured that people knew what everyone else was doing as well.' (PD24)

4.4 HIERARCHICAL STRUCTURES AND LEADERSHIP

Hierarchy manifested itself in various complex ways. To better understand hierarchy, we needed to explore leadership which was highly variable. Within this section, we describe how leadership was perceived, established and maintained, before focusing on hierarchical structures during resuscitation and the factors affecting it.

4.4.1 Leadership

4.4.1.1 Differing Perceptions of leadership

When asked who was leading during an arrest, the participants had different perceptions of leadership. In some cases, they felt that the leader was clearly identified- this was either through their position during the resuscitation, their role, or their communication skills. Indeed, they described leaders being at one end of the bed, being hands-off and allocating jobs to the rest of the team. Leaders would also be identified through other visual cues; for example, a paediatric registrar easily identified the emergency medicine consultant as leading due to them wearing a labelled apron during the resuscitation. Nursing staff and midwifery staff also identified the senior-most person as the team leader in resuscitation scenarios. Finally, in cases of clearly established leadership, leaders identified themselves as leaders early on by establishing clear communication lines with other members of the team and through their body language and voice: *'She had a loud voice and a commanding presence. That helped make it clear that she was leading'* (PD24)

Staff members also had differing views of leadership. For example, during neonatal resuscitation, most staff members felt that whoever was at the head end and managing the airway was the team leader: *I would say usually that whoever's got the airway is the one that's leading from the experience I have seen.'* (MW17). This was at odds with the traditional view of the team leader described in courses team leaders not being involved in practical procedures, but explanations offered were due to senior-most members needing to do critical procedures like intubating and leading, as stated by a paediatric consultant: *'In the neonatal side, you're trying to do half the things and trying to lead...'* (PD13).

During paediatric resuscitations similarly, participants felt that whoever was maintaining the airway was the team leader: *'I assumed he's leading the arrest now because he took over the airway when he had come in'* (PD2). However, this was predominantly the anaesthetist role, and they rarely saw themselves as leading the arrest as evidenced by observations of experienced paediatric doctors: *'the anaesthetists may have some idea of paediatric emergencies, but you do have to lead them a bit'* (PD20). *'I think now that [I'm more senior] I am more likely to continue being the team leader. [The anaesthetist] very much want to manage the airway and will help and support and make suggestions and things, but they won't be the overall team leader'* (PD21). In our study, interviewees therefore had different perceptions of who was leading during a resuscitation if it wasn't clearly stated. We also had a scenario where the paediatric registrar felt that the consultant was leading an arrest, whereas the neonatal nurse attending the same arrest felt that it was the paediatric registrar who was leading.

4.4.1.2 Paediatric doctors may sometimes be unable to be a hands-off leader, or lead

Paediatric doctors in our study found it difficult to remain hands off during a resuscitation. We reviewed one of the reasons being some resuscitations being attended by fewer members of staff, especially in secondary hospitals. Another reason for being hands on was the view that they felt the most skilled at performing procedures within the team: *'If there's no one who can adequately put a cannula in, then I would need to do the assessments and the procedures'* (PD1). They also had a level of responsibility towards the patient and some paediatricians preferred to do their own assessment, not trusting members who may not be as skilled in paediatrics. Once patient assessment, procedures and communication with specialties befell the same paediatrician, it was difficult to be a hands-off leader: *'[if you were remotely leading this] you might be thinking in your head, the endotracheal tube might not be in the right place now, something that's correctable. Yeah, that could give a very different outcome for this infant'* (PD22)

Another reason given for wanting to remain hands-on was to maintain this impression to other members, patients and parents of being dedicated and hardworking: *'We as paediatricians find it quite difficult to stay hands off. We don't want to be seen as the person not doing anything'* (PD1)

Finally, some paediatricians had difficulties in commanding, preferring to defer leadership to other specialities or their senior: *'Team members have certain personalities and it is not familiar for them to lead, especially if there's somebody more senior next to them. I've found myself passing leadership quite easily [to someone more senior]'* (PD3).

4.4.1.3 Different leaders for different scenarios

There was no consensus on who led a paediatric resuscitation and several factors came into consideration. Firstly, the emergency department's leadership and attitude towards paediatric resuscitation was explored: while some units had emergency doctors willing to lead arrests, especially those involving older children or trauma cases, paediatric trainees often found they were left to lead resuscitation in medical cases: *'I've seen an A&E consultant [lead] very well. I think it depends on where you*

are, how good the department is, how interested the A&E consultant is in Paeds....'(PD22) '[In A&E] usually if it's a child they'll let you take over as soon as you get there.(PD20) 'Usually it is the paediatric team leading the resuscitation... there was often poor leadership from A&E' (PD24). In some cases, this led to some paediatric trainees ignoring the emergency team as leaders due to their previous experience: 'I didn't even look at the A&E consultant- I mean they take the lead in paediatric trauma scenarios but in medical ones it's not always clear.'(PD2)

The type of patient undergoing resuscitation also had a bearing on who was more likely to lead: patients with respiratory illnesses requiring intubation were more likely to be managed mainly by anaesthetic teams, patients who had been involved in traumatic arrests were likely to be managed by emergency teams, and other medical emergencies were likely to be led by the paediatric team. However, this was not always clear and, in some cases, interviewees felt that all 3 led during the arrest: *'I think it varies on the situation. For arrests it tends to be all 3 [A&E, anaesthetist, paed] for trauma, A&E. For medical stuff paed'*(PD2) although this could lead to confusion as to the leader during a paediatric resuscitation as there may be no clear leader: *'I think for overall responsibility, I was wondering that they thought we were doing it and we thought they were doing it and to a degree there wasn't one person who was leading on it all'*(PD5).

The location also had a bearing on who would become the leader: a particular scenario described a neonatal resuscitation where the anaesthetic team led: *'I went to general theatre, I felt that the paediatric consultant needed to take control of the situation more. In that case the anaesthetic consultant was leading... He was saying things that I've never seen anyone do before in 15 years. I felt that it was because that was their base [theatre] that the anaesthetist took charge.'*(NN8) Being in unfamiliar surroundings often meant that the paediatric consultant would rarely take over leadership and this situation was also found during paediatric resuscitation in A&E: *'That paediatric consultant was less familiar with paediatric A&E resus than myself... when she came she didn't take over'*(PD2).

Much of the confusion around who should lead at a resuscitation seemed to stem from the fact that teams were formed in an emergency manner, with members not knowing each other, no briefing, introductions or role allocations- indeed trainees described how resuscitations where there had been a briefing beforehand ran more smoothly with a clear leader, defined roles: *'I assigned roles- asked nurses to prepare a UVC with a flush and a three-way tap and getting drugs out. I allocated the consultant as airway and leading, but leading jointly with me.'*(PD4)

In cases where leadership was not clearly established or communicated, the natural leader was more likely to be someone more senior from a hierarchical point of view, that is, a consultant instead of a trainee: *'When I was a junior registrar, [the anaesthetic consultant] perhaps would be more likely to be the team leader because I would defer to them from a hierarchical perspective'*(PD20). Similarly the majority of nurses and midwives interviewed felt that the person leading a resuscitation should be the consultant. This made it particularly harder when the trainees themselves were more senior, as experienced by a paediatric consultant expected to lead a

resuscitation with a senior trainee: *'I was the senior, this is a registrar who is nearly a consultant herself, and basically would be perfectly capable of running the whole show without me. As a consultant, do I need to be there? I am the consultant... it is a sick baby. But actually, I have got this person that would be experienced enough, even if I wasn't there. In fact, it's much easier when you've got someone who's just waiting experienced and junior and you know, very clearly you going to have a leadership role'* (PD14)

4.4.1.4 Taking over leadership and Co-leadership

While many participants felt that paediatric resuscitation should be led by the senior most member, we explored how senior paediatric trainees and paediatric consultants took over leadership.

Interestingly, all the consultants interviewed stated they would never automatically assume leadership when joining a resuscitation. They stated that they would assess the situation first and decide whether or not the ongoing efforts were adequate and patient appropriately managed: *'[When I come down to A&E] I have few seconds to assess- do I need to step in straight away and take over the leadership or do I have more time to guide people and just see what I can do to make things better'* (PD12). They viewed themselves more as facilitators rather than leaders, and reported a few reasons for that: one was professional respect for other team members: *'I very much believe that everybody...has got training, is a professional and knows what they're doing, but we need to help each other do that rather than 'I know more than you' or 'I'm in charge'*(PD13). Secondly, they felt that their junior members of staff may need the experience of leading a resuscitation as a training opportunity: *'If the trainee is leading well, that's a good opportunity for them to learn and I'll try to find a way of saying 'you keep the leadership. I'll be an active follower'*(PD3). Finally, they felt that a senior trainee with recent practice of resuscitation may be the most appropriate leader during a resuscitation: *'If there's an anaesthetist there, or experienced registrar who has just done PICU I would let them lead'* (PD13)

This was reflected by the trainee's experience of leading at a resuscitation as well: *'I think we need to practise [leading resus] before you're actually the consultant because you don't want to be the most senior person and have never actually managed it before'* (PD20) Most paediatric trainees in the study expressed that they would like to continue to lead if they had already started, with the support of a more senior person, and regularly expressed this concept of 'co-leadership'(PD21): *'[The anaesthetist] never took over, but she didn't completely defer to me either. It became kind of a joint thing... I felt that we were equal [between consultant anaesthetist and paediatric registrar]'* (PD1).

Through the interviews it was clear that leadership was not always clear, and by extrapolation the underlying hierarchical structures during a paediatric resuscitation. Many trainees favoured co-leadership, which made leadership unclear for other team members.

4.4.2 Hierarchical structures within teams

The interviews revealed that there was a distinct chain of command within nursing and midwifery staff which was especially adhered to by the more junior members. Indeed, both nursing and midwifery stated they would always report to their senior within their profession during a resuscitation: *'Every big decision has to go by the nurse in charge because they've got an overall responsibility for that shift that they're in charge of'* (NN6).

One participant described how during resuscitation in their unit, the nurses had already organised themselves within a smaller team with clear role allocation, while doctors were less organised: *'We were in our own little group of nursing staff and following the algorithm and had already delegated the jobs within ourselves'* (PN9).

Interfacing with other professionals (e.g. midwife talking to doctor, or nurse talking to doctor) was reported to be more difficult for some participants: junior members of staff preferred to express their thoughts and concerns with their own senior (that is midwife to senior midwife) rather than directly communicating with the doctor. They were also less likely to challenge the doctor directly- this led to the midwife waiting for her senior to come before challenging a doctor during a neonatal resuscitation.

'I think it is a big thing still- I mean the nurses might speak to the registrar, but probably wouldn't say a lot to some of the consultants because they are too scared'(PN9).

'I wouldn't be confident in saying it directly. I think I've been more confident saying it to a more experienced nurse.'(PN10).

Among doctors there was also a chain of command present: junior trainees were more likely to let their seniors lead from a hierarchical point of view. This was performed in many occasions, despite the fact that in some cases, the trainee would have been the most appropriate person to lead the resuscitation: *'The consultant led based on hierarchy, not experience. I think retrospectively I should have been the leader myself as I was more familiar with neonates'* (PD3).

As observed previously, hierarchical structures present prevented doctors from challenging decisions and they were also more likely to follow instructions of their seniors. *'Yes, I have experienced hierarchy within resus. I've had patients who've been intubated and going to ICU at which point care is handed over, but then stood back and thought 'ooh are you going to do anything about that [deterioration]? Some consultants and registrars would take that on board, whereas others, you feel like you couldn't even say that to them, you'd get shut down straight away'*(ED23).

From the interviews, the hierarchical structures were quite rigid at times, and less so in other occasions. We shall discuss the factors affecting the rigidity of that structure in the next section.

4.4.3 Factors affecting the rigidity of hierarchical structures

The first factor affecting hierarchical rigidity was how familiar the team members were with each other: those who were very familiar experienced a flat hierarchy: *'so we didn't have a hierarchy- there was no natural hierarchy because there are two consultants and the soon to be consultant registrar. We all knew each other very well'* (PD14) Indeed, the participants who worked in closed units such as NICU or PICU where the staff didn't rotate, found the hierarchy was flat, and felt comfortable in contributing to the resuscitation: *'There was no hierarchy... The junior doctor was ensuring the quality and synchronisation of the chest compressions [with the consultant]'* (PD4).

'[The consultant and the nurses] seemed to talk to each other and confer. And then they switched between them for the CPR. It didn't seem like there was an 'I'm higher than you. Therefore. I'm calling the shots or anything', they just seemed to discuss between them and make a definite joint decision.' (PN11)

As described above another factor affecting the rigidity was the relative seniority of the team members: participants found it more difficult to establish a strict hierarchy with more senior members: *'I don't think I'm particularly good at establishing a formal hierarchy [with people of similar seniority]'* (PD14).

We explored the impact of gender on establishing hierarchy. Gender was not felt to be a factor by most participants (8/11). Participants who didn't think gender was a factor stated that paediatrics and neonates were usually female dominated specialities.

The ones who felt gender may have an impact observed how there was still innate gender bias within some team members: *'A lot of my female colleagues say they always are assumed to be nurses, and I've heard stories of people muscling in front of a young woman, and it turns out she's a senior consultant!'* (PD14). One female participant also expressed her views regarding leadership and gender: *'I think it's silly that people assume there should be 50% leaders because there are 50% women in the society because I think the female gender intrinsically belongs to one where you are less likely to want to lead. It doesn't mean you are not capable of it- it is a complex issue and dependent on individuals.'* (PD5) She felt that female members of staff may be intrinsically less willing to lead.

All participants agreed that if gender played a role in hierarchy, it would only be in situations where team members hadn't worked with each other and hadn't appreciated the competence and skill of their peers.

Finally, all paediatric trainees and consultants advocated a flattened hierarchy, and it was rare for them to establish themselves as team leader. They described themselves as a *'facilitator'* (PD13) rather than team leader. This flattened hierarchy was also observed among paediatric trainees and nursing staff: *'In paediatrics... no one is frightened to say 'I don't think this is right' and make people think, even up to consultant level. I think we work a bit more for the child and take our egos out and a nurse wouldn't be scared to speak up to a consultant in a resus because it's about what's best for the child'* (PD20).

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4.5 DISTRICT GENERAL HOSPITALS (DGH) VS TERTIARY HOSPITALS

As a good mix of doctors and nurses had worked in both DGH and tertiary hospitals, we were able to explore the differences between them and the potential reasons for why resuscitation had better outcomes.

Increased exposure to seriously unwell children in tertiary hospitals was inevitable. One paediatric doctor commented: *'bigger hospitals have sicker children who are at risk of arresting'* (PD3). This had a knock-on effect on multiple aspects.

Firstly, staff in tertiary hospitals become more competent by increased exposure. Secondly, this led to differences in team composition and resources- tertiary hospitals had more staffing, more dedicated facilities and more resources targeted at management of complex or critically unwell patients. This difference was noticed by the team composition during some neonatal resuscitations where a sick neonate may be attended by up to seven dedicated staff members in a tertiary hospital, as compared to between 3 and 4 in a district general hospital, as explained by a neonatal nurse attending a regional stabilisation day and describing her team composition during a neonatal arrest: *'[The other nurses] are horrified, because they say you need at least 10 people to do the stabilisation.'*(NN8) Thirdly, bigger hospitals with dedicated units have a greater incentive to ensure their staff remain properly trained- this may be in the form of regular simulation sessions. One of the paediatric trainees stated that they *'experienced more training opportunities in bigger hospitals, with weekly [simulation] scenarios being run'* (PD3).

This translated to teams being more confident in tertiary hospitals than in district general hospitals, and could be a contributory factor in the differences between tertiary and district general hospitals. Indeed, some nursing and midwifery staff in district general hospitals felt less confident in managing sick patients, with worries regarding staffing and experience of the medical staff:

'Sometimes in a DGH you may be left with a sicker baby by yourself... If the [endotracheal] tube comes out, I would be worried if there's not a doctor here straight away'(NN7)

'I felt in a tertiary unit the doctors had a lot more experience and I felt more confident there' (NN7)

'Even our most qualified doctor may not have done a resus for a long time...' (NN8)

Some doctors also felt more confident in a tertiary hospital, as they felt they could get expert help rapidly as compared to a DGH. In the latter, *'you will get an adult anaesthetist. They don't know our guidelines or fluid boluses'* (PD20). Another doctor felt the *'psychological backup'* (PD21) of having a paediatric intensive care on site in a tertiary hospital and the ability for paediatric intensivists to attend and stabilise critically unwell patients.

The overall increased confidence had an impact on the followership and hierarchy in the two different settings. The hierarchy was flatter in NICUs and paediatric intensive care units. One of the senior paediatric trainees observed that nursing staff were more active followers and likely to contribute to decision making in tertiary hospitals as compared to DGH:

'I think there is confidence from the wider members of the team, to give an opinion in a tertiary hospital- the nursing staff would be more used to giving an opinion, directing thoughts and contributing to decisions...A relatively senior nurse in a DGH may have less exposure... and there were lot of things being left to the most senior member of the team to make decisions.'(PD4) It seems likely that a team leader in a DGH would need to therefore not only perform technical aspects of the resuscitation due to lack of skills within the team, but also be able to manage the team members who may be in a more passive mode from a followership perspective.

5. DISCUSSION:

To my knowledge, this is the first study looking at human factors during paediatric and neonatal resuscitation in the UK. We will discuss the relevant results along with recommendations in this section. The strengths, rigour and limitations of the study are discussed in detail in Appendix M.

COMMUNICATION ASPECTS

This study mirrors the fact that issues in communication are common during a resuscitation (La Pietra *et al.*, 2005). My study however goes in depth in trying to understand what barriers to communication exist and why they occur. I found that communication issues were multifactorial: the experience, voice and personality of the team member, coupled with situational factors such as stress, presence of parents, unfamiliar environment and task fixation, and team factors such as size of team and prior interprofessional relationships all contributed to poor communication.

Similar factors existed with issues during call-out, along with prior experience of call-out, fear of undermining colleagues, unfamiliar teams and authoritative leader in a steep hierarchical structure.

From my own experience, and review of the literature where call-outs were examined in simulation (Hargestram, Lindkvist, Brulin, Jacobsson, Hultin, *et al.*, 2013), I suspect the situational factors can be so varied that a call-out may be omitted during a resuscitation.

The presence of parents is particularly relevant to paediatric and neonates and has not been previously considered in the literature. It may be an extension of paediatrician's personality of wanting to be 'nice' and prevent moral distress. Given it is socially acceptable, and beneficial for parents to attend their child's resuscitation, it may be necessary to further reinforce the situational factors during resuscitation training and practise call-out in the presence of simulated parents. Another way to

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overcome the fact that parents may understand that their child is deteriorating is implementing specific code words only known to the resuscitation team- this technique would then make members less afraid of upsetting or worrying the parents.

The fact that call-out was not universally recognised during this study suggests that training on the recognition and ways of performing call-outs should be emphasised in regular team training during resuscitation.

FOLLOWERSHIP ASPECTS

The APLS manual advocates for active followership (Samuels and Wieteska, 2016). While factors such as leadership style, role allocation and team composition had been described in the literature previously, my study looking at what made followership more or less active also found factors such as the team member personality, level of experience, prior exposure and experience of a resuscitation, team size, unclear leadership, shared mental model and support from other followers to be significant factors in how active a follower would be during a resuscitation.

This is particularly relevant for paediatric resuscitation where the leader, as described below, may not always manifest itself clearly. Having active followers depends on having a well-defined leader. Those findings on followership, if replicated or generalised in other studies, may help further human factor training during resuscitation by helping team leaders 'activate' passive followers, or manage bigger teams through better role allocation, creating an open environment for followers to contribute, and regular summarising to ensure a shared mental model.

Resuscitation training should also focus on how to be a good follower rather than mainly teaching leadership skills as during the study participants described how they would look for support from other team members if the team leader was not approachable.

LEADERSHIP AND HIERARCHY ASPECTS

My study found that a flattened hierarchy predominantly exists within paediatrics and neonates. This may be due to teams being familiar (in a neonatal or paediatric intensive care setting) or the fact that paediatricians through their personality and behavioural characteristics were unlikely to impose a rigid hierarchical structure.

However, this lack of a rigid hierarchy led to situations where there was no clear leader, or the member leading was not the most appropriate, and was not challenged.

Through the interviews, it became clear that there were several aspects of resuscitation that all need to occur at the same time: there was the mechanistic

process of the resuscitation in terms of preserving the physiology and going through the algorithm. There was also diagnostic reasoning with the aim of finding the cause for the patient's deterioration, discussion with other teams such as neurosurgical specialties or social workers if other children were at risk, discussion with parents and making decisions regarding stopping treatment. Within paediatric resuscitation, these tasks need to be done by the senior-most person who is considered the leader, but is rarely undertaken by only one person. It is therefore likely that there are multiple 'leaders' within paediatric resuscitation who are working jointly to treat the patient. It may be useful in acknowledging this as a genuine part of role allocation in subsequent resuscitations provided there are enough members of staff.

'There is acute clinical stuff, then emotional stuff, management of other things like social services, police. So, there's different domains. The hierarchy depends on degree of the competencies in these different domains and their strength will vary depending on the area of speciality' (PD2)

DISTRICT GENERAL HOSPITALS VS TERTIARY HOSPITALS

The likely reasons for difference between resuscitation in tertiary and district general hospitals have been explored before, namely access to better post resuscitation care, or higher frequency of invasive procedures such as haemodialysis (Michelson *et al.*, 2018). My study considers the human factors associated with these differences, and finding that the increased confidence of staff members due to increased exposure to resuscitation cases led to more active followership during arrests.

To conclude, my study found several human factors which cause an impact on communication, call-outs, followership and hierarchy. It is important for these to be recognised and resuscitation teams made aware of them so that future resuscitation training can incorporate and address these factors.

A final recommendation would be that my study found that in many cases, hierarchical barriers, passive followership and poor communication were all improved through the use of regular simulation training where team members interact with each other and with other specialities. Debriefing was also felt to be helpful in cases where followers wondered about doing call-outs or were unsure of the leadership and tasks required. These should be instigated at a local level to identify technical, logistic and human factor issues within that department.

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Appendix A: Search Terms, Sources used, Reference Manager and example search

KEYWORDS/SEARCH TERMS USED

The following keywords were used:

Paediatric or pediatric

Neonatal

Resuscitation

Arrest

Emergency

Communication

Barriers

Followership

Leadership

Teamwork

Medical Errors

Hierarchy

Leadership

Call out

Closed loop communication

Tertiary care or hospital

Secondary care

District General Hospital

Trauma

Post- Resuscitation

Debriefing

Simulation

SOURCES USED:

Primary sources - journal articles and original documents of governmental and non-governmental organisations. These include original research and documents from the NHS website.

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Secondary sources - review articles and search of references given in the original articles

Tertiary sources - the advanced paediatric life support course manual. Most of the material obtained was found by searching databases such as Keele library search database, google scholar, PUBMED, Medline and EBSCO.

REFERENCE MANAGEMENT

Mendeley was used as reference manager.

A.4 Example of search

Two examples of a search performed during the literature review follows:

Barriers AND/OR communication AND resuscitation AND paediatric OR pediatric OR neonatal

Hierarchy AND resuscitation AND paediatric OR pediatric OR neonatal

Appendix B: Care Teams and resuscitation skills

The National Cardiac Arrest Audit 2015/2016 reported that out of 16,617 cardiac arrests occurring in hospitals, only 1% involved the paediatric population (2016). Paediatric cardiac arrests are much rarer events, and staff are therefore less experienced with them. This is reflected by the limited confidence doctors have in resuscitation skills involving children, and that the confidence improved with seniority. (Van Schaik, Von Kohorn and O'Sullivan, 2008). Regarding neonatal resuscitation, the majority of babies attended do not require any intervention. A study from Sweden showed that out of 97 648 deliveries, only 2 per 1000 required intubation at birth (Palme-Kilander, 1992).

Furthermore, an American study showed that only 1 per 1000 required more intensive resuscitation in the form of chest compressions or resuscitation drugs. Interestingly, the presumed clinical events contributing to neonatal deterioration were felt to be ineffective or improper initial ventilatory support in two thirds of cases (Perlman and Risser, 1995). This article highlights two important points: firstly, as with paediatric resuscitation, staff have limited exposure to cases where newborns are critically unwell and require multiple interventions. Secondly, inadequate management in the first few minutes of life in a newborn can cause rapid deterioration and the need for cardiopulmonary resuscitation.

While neonatal and paediatric resuscitation are different from adult resuscitation due to differences in anatomy, physiological reserve and disease processes (Samuels and Wieteska, 2016), they nevertheless follow a systematic approach in the assessment and treatment. Both comprise fairly rigid algorithms with a sequence of events aimed at maintaining oxygen delivery and restoring cardiac output. There are multiple processes involved including chest compression, securing the patient's airway, gaining intravenous access and drug administration which require communication between team members (Samuels and Wieteska, 2016).

Paediatric teams usually include a paediatric nurse, a junior trainee who may or may not have specialist paediatric knowledge, a senior paediatric trainee or nurse practitioner and a paediatric or emergency medicine consultant. An anaesthetic trainee or consultant who may or may not have specialist paediatric experience will also attend. In hospitals with a dedicated paediatric intensive care unit (PICU), further support may be obtained with a paediatric intensivist attending the resuscitation.

In cases where a newborn baby is found to be critically unwell, a team comprising a junior trainee, a senior paediatric trainee or nurse practitioner, and consultant may attend. There are however cases where other members may be present, for

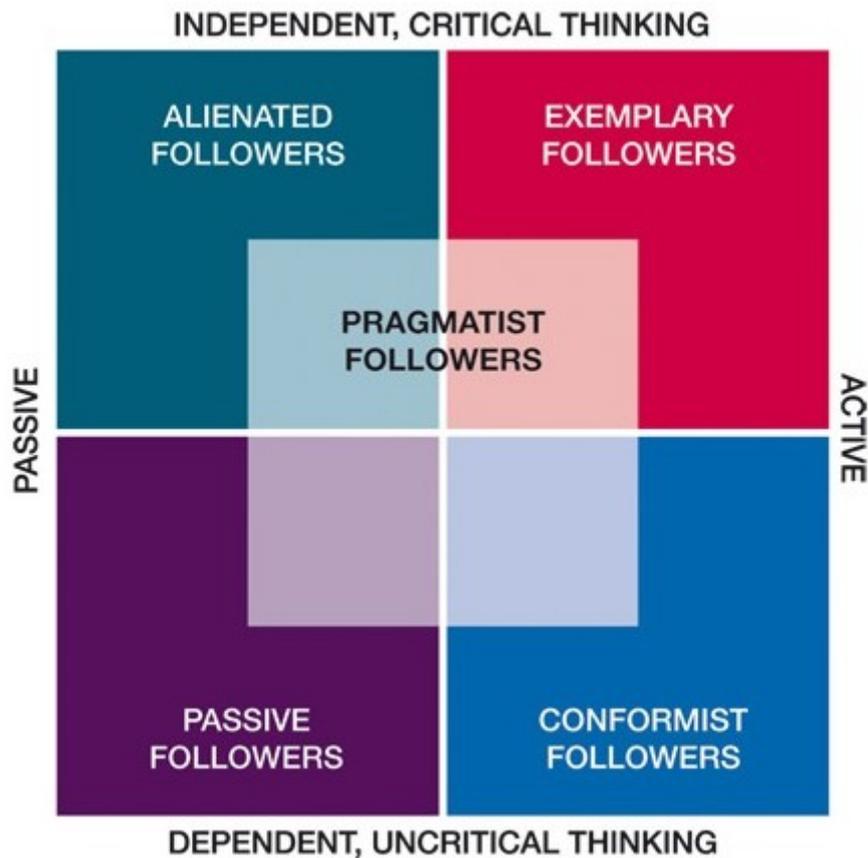
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example, an anaesthetic doctor looking after the mother during a caesarean section, or obstetric doctor.

Through a combination of resuscitations being rare, trainees changing job placements every four to six months, and shift pattern working in compliance with European working time directives, trainees often do not know other members of the team and they may be meeting for the first time during the resuscitation (*Working hours and patterns FAQs - NHS Employers*, 2016). However all staff dealing with children on a regular basis should have specific training in paediatric resuscitation including paediatric life support and advanced paediatric life support (Samuels and Wieteska, 2016). Similarly staff attending deliveries of newborns or working on the neonatal unit must have training in neonatal life support (Wyllie, 2016).

In both cases, we have teams who will have some baseline knowledge of resuscitation through attending mandatory courses. They will, however, have members at different levels of seniority and hierarchy, who may or may not be familiar with local processes or with other team members and may be forming adhoc in front of a critically unwell patient. These share some similarities with some adult resuscitation and some of the findings can therefore be extrapolated to this population.

Appendix C: Description of Followers and Follower types



Gibbons and Bryant (2012) explain that that followers are not passive agents, but rather should be closely involved in decision making and interacting with their leader. They describe 4 different types of followers: the first one being the 'passive' follower who is not engaged with the team, and has low 'critical thinking.' These team members require constant supervision and motivation, and can take the full attention of the team leader, reducing their overall situational awareness. The second type is the 'conformist follower.' These will be involved and supportive of the task, but will not question alternative options and may not take any initiative without their team leader. The third type is described as "alienated." While they have high levels of critical thinking, they are detached with the task and may come across as sceptical. The fourth type is the exemplary follower who will 'apply constructive critical thinking and interact with the group and the leader' (Gibbons and Bryant, 2012) They are the ideal follower type, i.e. they will take the initiative, support their leaders and also challenge decisions in a respectful manner to achieve the goals of the team. In practice, it is likely that team members may move between the different types during a task.

Another study with participants from different industries and organisational levels explored the participants' concept of followership in context with the leadership. This also showed that followership exists along a passive, active and proactive dimension, with a fairly even distribution among the three groups. Participants identifying themselves as passive emphasised the importance of accepting their leader's expertise, and obeying commands. This reflects the social tendency of obeying authority figures and accepting the hierarchy. Respondents who identified themselves as active followers reported remaining obedient and maintaining a positive attitude throughout, whether they agreed with their leader or not, but would offer their opinion if given the opportunity (Carsten *et al.*, 2010). Finally, the third group identifying themselves as proactive felt their relationship with the leader was more of a partnership rather than a submissive one. They viewed themselves as co-leaders, willing to challenge their manager if required to meet the objective of the team (Carsten *et al.*, 2010).

They explored whether followership styles were related to personal qualities: this showed that passive followers felt that they were flexible, had a positive attitude and were obedient. They also felt that challenging the leaders was a behaviour of an ineffective team member. This is in contrast with the more proactive followers who felt that taking initiative was key to success, and condemned blind obedience. They were also more likely to voice their concerns, and went out of their way to solve problems without fear of reprisal. The researchers concluded that proactive followers exhibited behaviours and qualities which were traditionally associated with leadership rather than followership (Carsten *et al.*, 2010). Resuscitation groups are multidisciplinary, sometimes comprising team members of similar seniority. Who leads during the resuscitation becomes easier to understand once we realise that personal qualities influence the followership profile.

Carsten *et al.* also explored the link between followership styles and the leadership- in the empowering or supportive leadership, participants felt they could be in a proactive followership role, whereas in an authoritarian leadership, active and proactive followers found it much harder to work, and had to revert to a more passive role- one participant identifying himself as passive however expressed concerns of working with empowering leaders: indeed they felt less comfortable sharing decisions and content to stay in a passive role (Carsten *et al.*, 2010).

It is undeniable that leadership and followership are closely linked. This has been observed in other fields such as business and education settings (Vecchio, 2007). Another study also shows similar findings that leadership styles and their work engagement directly impacted on leader-member relationship and performance (Gutermann *et al.*, 2017). Within management, Gale describes that team dynamics are dependent on leadership 'power position' and the leader-member relationship(2018). While these studies do not focus on resuscitation it is likely that

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those human factors are pervasive through different fields of work and likely to be applicable.

Conversely, followers can also have an impact on the leaders themselves. Indeed in a study by Schneider et al, they found that passive followers were more likely to elicit negative emotions such as anger, alarm, shock, anxiety from leaders as compared to active followers who were likely to generate positive emotions such as pleasure, gladness and thankfulness (Schneider *et al.*, 2014). This may in turn have impacts on the team performance.

Appendix D: Review of different data collection methods

The first data collection method considered was observation of a real resuscitation scenario. This is further broken down in three different approaches: the first one, free observation, is unplanned, and allows the researcher to not be constrained by a specific plan, but rather record the actions, reactions and interactions of the team (Stewart and Filice de Barros, 2018). Another type is participant observation, whereby as a researcher, I would play an active role within the group and interact with the team members being observed. Thirdly, non-participant observation is where the researcher is not playing an active role within the group but carrying out a planned, structured observation.

The main advantages of observation are that it allows for rich descriptions of the event and capturing data which may be missed by recall bias. The disadvantages pertaining to this study is that as a senior registrar who is used to leading emergencies, my perspective would be different from other team members. The research questions may have different answers based on the participants' level of seniority or profession, and my intention was obtaining views of other team members. I would have to follow any observation by an interview or a stimulated recall exercise. Moreover, it would be very difficult to observe events carefully and comment on seemingly ordinary events due to my familiarity with the event and members of the team (Stewart and Filice de Barros, 2018). From the practical point of view, it is also unfeasible to organise due to the unpredictable nature of the scenario itself (critically unwell patients being brought into accident and emergency departments, unexpectedly unwell babies being born or unexpected deterioration of patients on the ward). Participant observation would also be unacceptable due to the serious condition of the patient and the role I would have during the stabilisation process- it would not be ethical to perform resuscitation therapy while also actively observing other members of the team and taking notes. Video recordings have other logistic and ethical issues such as information governance, data storage within hospitals, and confidentiality and obtaining consent from participants and parents which may not be appropriate at the time (Stewart and Filice de Barros, 2018).

The other types of qualitative data collection include critical incident analysis, self-reports, diaries and experiential accounts (Anshu and Grant, 2018). These would rely on obtaining patient records to identify when critical incidents had occurred- requiring further approval from the ethical committee and local hospitals research committee. This was not feasible within the time frame. Approaching individual participants who I know had been involved in that scenario would also be unethical as participating in a research study has to be voluntary and staff would be suspicious and unlikely to participate.

Another data collection method considered was questionnaires- this would involve a combination of multiple choice and short-answer free text questions asking

participants on their views and opinions who would write in the answers. The advantages of questionnaires are that they are cheaper methods to collect and analyse and less time consuming than interviews. They can also be filled in anonymously, which some participants may appreciate as this could lead them to be able to express their true, more controversial views than through a face-to-face interview. However, the main problem with questionnaires, particularly in this concept, is that it would be difficult to design appropriate questions to be answered due to lack of knowledge about the views and perceptions of particular team members during resuscitation scenarios- this data is much better obtained through exploratory interviews where an interested researcher can ask follow up questions. Furthermore, the study has concepts such as followership and hierarchy which are unfamiliar to many staff members (from preliminary, pre-study discussions) and need clarification for the interviewees to answer correctly- a written questionnaire would require lengthy explanations within it to ensure participants were answering in an appropriate manner. Questionnaires also assume that there is one reality, while the hallmark of qualitative research is accepting that different people have a different view of the world and different interpretation of an experience (Stewart and Filice de Barros, 2018). An interview would therefore be a more valid collection method. Interviews are also associated with higher response rates compared to questionnaires.

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Appendix E- List of sites where sampling occurred

The following sites had information leaflets put on and heads of department contacted. Sampling was undertaken from those sites:

1. Sunderland Royal Hospital neonatal intensive care
2. Sunderland Royal Hospital paediatric emergency department
3. Sunderland Royal Hospital paediatric wards F63, F64, F65
4. University Hospital North Durham paediatric ward and accident and emergency department
5. University Hospital North Durham maternity unit and special care baby unit
6. Darlington Memorial Hospital paediatric ward and accident and emergency department
7. James Cook University Hospital accident and emergency unit and paediatric ward
8. James Cook University Hospital maternity unit and NICU
9. Royal Victoria Infirmary maternity unit and NICU
10. Great North Children Hospital paediatric wards and accident and emergency unit
11. Great North Children Hospital PICU

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Appendix F: Interview Schedule

REGARDING SCENARIO

Communication:

1. Describe the communication between team members
2. Describe the communication between the team leader and other team members?
3. Were you able to raise concerns (call out) during the scenario?
 - a. Prompt- if so, why? How was that received?
 - b. If not, why not?
4. Overall did you feel listened to?
5. Was there use of close loop communication?
6. Describe the handover (if any) which happened

Followership/Teamwork

1. Describe your role within the team
2. How many different roles did you have within the team?
3. What was your perception of other team member's roles?
4. Were you aware of what was going on? (shared mental model)

Leadership

1. Describe the leader in that scenario? (characteristics, personality, approachability, orders given, task delegation)
2. Was there a clear leader?
3. Was there a perceived leader (someone everyone taking directions from who isn't the stated leader)?
4. What is the reason for a perceived vs stated leader?

Hierarchy

1. What was the relationship between the leader and other team members? (steep vs flat hierarchy)
2. What was the relationship between the paediatrician and *insert other specialty* in terms of leadership?
3. Describe the hierarchy during the resuscitation

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DEMOGRAPHIC/STRATIFYING DATA

1. Age range? 20-30 → 30-40 → 40-50→50+
2. Gender? M/F
3. Role:
4. Years of experience
5. Critically unwell cases per year
6. Arrests per year
7. Confidence in paediatric and/or neonatal resuscitation? Likert 1-5
 - a. Why
8. Confidence in leading paediatric and/or neonatal resuscitation? Likert 1-5
 - a. Why
9. How comfortable would you be doing call outs? Likert 1-5
 - a. Why

FINAL QUESTIONS

1. What are your thoughts about communication during paediatric or neonatal arrests?
 - a. What are the barriers you have experienced?
 - b. How would you improve it?
2. What are your thoughts about teamwork during paediatric or neonatal arrests?
 - a. What are the barriers you have experienced?
 - b. How would you improve it?
3. Do you prefer a leader taking all the decisions or one constantly asking for everyone's opinions during a resuscitation?
4. What do you think your value is within a team during resuscitation?
5. What do you think your role is within a team during resuscitation?
6. How do you usually fit into your role within a resuscitation?
7. Do you think hierarchy can be a barrier during resuscitation? If so, how?
8. How is hierarchy a barrier during resuscitation?
9. What impact does presence of parents have on the communication of team members?
10. What impact does presence of parents have on the performance of team members?
11. What impact does gender have on resuscitation?
12. What are the differences according to you of resuscitation in district general hospital and tertiary hospital?
13. What type of follower do you believe you are?

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Appendix G: Ethical approval from Keele Ethical Research Board

Satyam Veeratterapillay
School of Medicine

11 March 2019



Dear Satyam

Re: Application 19-03

Title: Exploring followership, hierarchical structures and barriers to effective communication during paediatric and neonatal emergency situations and resuscitation: a qualitative study

Thank you for submitting your revisions following your ethics application to the School Student Project Ethics Committee (S-SPEC). These have been reviewed and I am happy to confirm that your project has now been approved. Please note that you must inform us of any changes or deviations to the approved project.

Good luck with the research.

Best wishes,

A handwritten signature in cursive script that reads "K. M. Adams".

Dr Karen Adams
Chair,
S-SPEC

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Appendix H: Information leaflet given to participants

Information leaflet

Exploring followership, hierarchical structures and barriers to effective communication during paediatric and neonatal emergency situations and resuscitations: a qualitative study

IRAS number 258484

Research investigator: Dr Satyam Veeratterapillay

Thank you for expressing your interest in my project. I am a paediatric registrar training in the North East, and currently doing a Masters in Health Professions Education: Accreditation and Assessment with FAIMER-Keele University. As part of my dissertation, I am doing a qualitative study looking at critically unwell babies and children and their resuscitation and stabilisation.

What is the purpose of this study?

Paediatric and neonatal resuscitations are rare events. However, when they occur, the outcome is usually poor. Teamwork and leadership training have been shown to improve performance of the team during resuscitation in a simulation setting. This includes the concept of 'call out' and 'closed loop communication'. 'Call out' is the verbalisation by a team member of an observation, especially when things are not going well. 'Closed loop communication' is a verbal feedback method which consists of a sender transmitting a message, the receiver acknowledging the message, and the sender verifying that the message was received correctly.

However, it is less clear whether these are actively used in real life settings and whether there are any other factors which may affect communication during resuscitation scenarios.

Simulation training usually focuses on training leadership skills, including the need to have good situational awareness and be able to communicate effectively as a leader. There is less focus on how to be an effective follower.

Simulation training also advocates the use of a flatter hierarchy, although it is unclear how this translates into real life scenarios.

The purpose of this study is to explore what barriers exist to effective communication between team members during real-life resuscitation scenarios.

Why have I been invited to take part?

Nurses and doctors who work with sick babies and children are likely to have been involved in resuscitation scenarios, or dealing with critically unwell babies and stabilising them. I plan to recruit doctors and nurses in multiple hospitals in the North East.

What does it involve?

The study will be an interview which may be face to face or telephone interview. We would aim to have a face to face interview preferably, and only in specific circumstances will we opt for a telephone interview. You will be invited to think of a resuscitation scenario which was memorable to

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you. A particularly relevant scenario to my study would be one where you felt things didn't go as well as you thought they could. You will not be asked for the specific details of the patients, team members or outcome during the interview, and the questions will focus more on what factors impacted communication in that setting.

The interview will last between 45 to 60 minutes. You will be invited to talk more about a particular resuscitation scenario (or more) which you felt could have gone better. We will also explore concepts of leadership, followership and hierarchy at that time. This will be a face-to-face interview.

The interview will be audio-recorded on a password protected device, which will be destroyed after the study. Any other data I collect will be stored in a confidential folder in a locked cabinet or in a password-protected document.

Towards the end of my master's project, I may contact you further and send you a draft of your transcript along with interpretation of concepts from the interview. You will be invited to review these to ensure that this is indeed a correct transcript of what you said, and correct interpretation. A summary of the dissertation main results will also be sent to you afterwards.

How will it help me?

We hope that this study will help to elicit barriers to communication during resuscitation scenarios, and examine hierarchical structures during them. This is a poorly studied aspect of resuscitation in paediatrics, as most research currently focuses on the team leader. At the end of the study, once data is analysed and disseminated, we plan to present the results of the study to the participating units. We plan that the discussion generated by this study may help to generate new forms of training to deal with resuscitation scenarios.

Anonymity and Confidentiality

All the data collected will be anonymised. This includes your details, patient details, team member's details and hospital where it occurred. As I will be sampling from different hospitals, including neonatal intensive care, paediatric wards, and accident and emergency units from different hospitals, no identifiable information will be published. Specific details may also be omitted as my study will be focusing on communication aspects between team members.

Whatever is discussed during the interview will be confidential. The only exception is in the event of disclosure of malpractice which hasn't been previously disclosed or analysed by the relevant clinical team. If that is the case, confidentiality may need to be breached with the most appropriate authority in the interests of patient safety. We will discuss that with aspect with you at the time, and would escalate through your line manager following the trust's local protocol as duty of candour.

What are the risks?

The main risk during the interview is that some participants may experience moral or emotional distress when remembering certain situations involving critically unwell children. If that is the case, we will be able to stop the interview and postpone it if required. You will also be offered a debrief on any particularly distressing aspects.

Do I need to participate?

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No this is entirely voluntary. This study is part of my masters' project and is completely separate from my current clinical work. You are welcome to question the study methodology and to refuse to answer certain questions during the interview. You have the right to withdraw from the study at any time, including during the interview, or afterwards. In the event that you withdraw during or after the interview, we would meet with you to discuss whether we would be able to analyse the data already collected. The data will be anonymised when analysed. We will respect your wishes if you request complete and total withdrawal from our study (that is, complete deletion of your data), provided you contact us by 15th July 2019. After that point, the draft will be submitted for review prior to publication of results on 29th August 2019.

General Data Protection Regulation statement

NHS Lead Employment Trust Health Education England is the sponsor for this study based in the United Kingdom. We will be using information from you in order to undertake this study and will act as the data controller for this study. This means that we are responsible for looking after your information and using it properly. NHS LET HEENE will keep identifiable information about you for 3 years after the study has finished until publication of results. *In this study, the only identifiable information which will be stored will be your name and signature on our consent form. All other data will be anonymized prior to analysis.*

Your rights to access, change or move your information are limited, as we need to manage your information in specific ways in order for the research to be reliable and accurate. If you withdraw from the study, we will keep the information about you that we have already obtained. To safeguard your rights, we will use the minimum personally-identifiable information possible.

You can find out more about how we use your information by contacting the lead investigator.

We will collect information from you for this research study in accordance with our instructions.

The principle investigator will keep your name, and contact details confidential and will not pass this information to NHS LET HEENE. The principal investigator will use this information as needed, to contact you about the research study, and make sure that relevant information about the study is recorded for your care, and to oversee the quality of the study. Certain individuals from NHS LET HEENE and regulatory organisations may look at your medical and research records to check the accuracy of the research study. NHS LET HEENE will only receive information without any identifying information. The people who analyse the information will not be able to identify you and will not be able to find out your name, or contact details.

The principal investigator will keep identifiable information about you from this study for 3 years after study period has ended

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Who do I need to contact if I have more queries or I am not happy with certain aspects of the project before, during or after my participation in it?

This research has been reviewed and approved by Keele University Ethics Board. If you have any further questions or concerns about this study, please

Contact information

Dr Satyam Veeratterapillay MBBS, MRCPCH

Tel : 07735253229

E-mail : Satyam.veeratterapillay@gmail.com

You can also contact my supervisor: Dr Tony Errichetti

E-mail: tony.errichetti@gmail.com

If you have a concern about any aspect of this study, you may wish to speak to the researcher(s) who will do their best to answer your questions. You should contact Dr Satyam Veeratterapillay on **07735253229** or satyam.veeratterapillay@gmail.com. Alternatively, if you do not wish to contact the researcher(s) you may contact my supervisor who is Dr Anthony Errichetti on tony.errichetti@gmail.com.

If you remain unhappy about the research and/or wish to raise a complaint about any aspect of the way that you have been approached or treated during the course of the study please write to Nicola Leighton who is the University's contact for complaints regarding research at the following address: -

Nicola Leighton

Research Governance Officer

Directorate of Engagement and Partnerships

IC2 Building

Keele University

ST5 5NH

E-mail: [n.leighton@ keele.ac.uk](mailto:n.leighton@keele.ac.uk)

Tel: 01782 733306

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Appendix I: Consent form given to participants

Interview Consent Form

Research project title: Exploring followership, hierarchical structures and barriers to effective communication during paediatric and neonatal emergency situations and resuscitation: a qualitative study

Process

You will be invited to discuss communication, hierarchical structures, barriers to communication and qualities of good followers and leaders during the interview. It will be especially useful if you could use one or two previous experience of having been in a resuscitation scenario and reflect on what worked well, and not so well during that episode. You will not be expected to discuss the specific date or identity of the patient involved in the scenario, specific details of the resuscitation, or identify any team member by name as this is not the focus of the interview. The interview will last 45 to 60 min. We don't anticipate that there are any risks associated with your participation, but you have the right to stop the interview or withdraw from the research at any time.

Ethical procedures for academic research undertaken from UK institutions require that interviewees explicitly agree to being interviewed and how the information contained in their interview will be used. This consent form is necessary for us to ensure that you understand the purpose of your involvement and that you agree to the conditions of your participation. Would you therefore read the accompanying information sheet and then sign this form to certify that you approve the following?

- the interview will be recorded via an audio recording device
- you may be sent the transcript/significant statements and given the opportunity to correct any factual errors
- the transcript of the interview will be analysed by Dr Satyam Veeratterapillay as research investigator only
- access to the interview will be limited to Dr Satyam Veeratterapillay only
- All the data obtained will be confidential and will be anonymised before publication of the results to maintain confidentiality of the participants.
- In the event of disclosure of gross malpractice, confidentiality may be need to be breached in the interests of patient safety. If such is the case, you will be informed prior to data being shared, and we will only share it with the relevant authority (e.g. head of department).
- any summary interview content, or direct quotations from the interview, that are made available through academic publication or other academic outlets will be anonymised so that you cannot be identified, and care will be taken to ensure that other information in the interview that could identify yourself is not revealed.
- the actual recording will be destroyed after transcription and analysis

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- Any data from the transcriptions and consent forms will be stored in a secure location in a locked filing cabinet at NHS Lead Employment Trust HEENE
- any variation of the conditions above will only occur with your further explicit approval

Quotation Agreement

I also understand that my words may be quoted directly. With regards to being quoted, please initial next to any of the statements that you agree with:

1. I agree to be quoted directly if my name is not published and a made-up name (pseudonym) is used.
2. I agree that the researchers may publish documents that contain quotations by me.
3. All or part of the content of your interview may be used;

In academic papers, policy papers or news articles

On our website and in other media that we may produce such as spoken presentations

On other feedback events

In an archive of the project as noted above

By signing this form, I agree that;

1. I am voluntarily taking part in this project. I understand that I don't have to take part, and I can stop the interview at any time;
2. The transcribed interview or extracts from it may be used as described above;
3. I have read the Information sheet;
4. I don't expect to receive any benefit or payment for my participation;
5. I can request a copy of the transcript of my interview and may make edits I feel necessary to ensure the effectiveness of any agreement made about confidentiality;
6. I have been able to ask any questions I might have, and I understand that I am free to contact the researcher with any questions I may have in the future.
7. I understand that relevant sections of my data collected during the study, may be looked at by individuals from NHS site (e.g. City Hospitals Sunderland NHS Foundation Trust), from regulatory authorities or from the NHS Trust, where it is relevant to my taking part in this research. I give permission for these individuals to have access to my records.
8. I understand that the data will be treated confidentially, unless there are serious malpractice issues which may impact patient safety.

Interview Consent Form

Exploring followership, hierarchical structures and barriers to effective communication during paediatric and neonatal emergency situations and resuscitation in district general and tertiary hospitals in the United Kingdom: a qualitative study.

Name: _____

Signature: _____ Date: _____

Researcher: _____ Date: _____

This research has been reviewed and approved by Keele University Ethics Board. If you have any further questions or concerns about this study, please

Contact information

Dr Satyam Veeratterapillay MBBS, MRCPCH

Tel : 07735253229

E-mail : Satyam.veeratterapillay@gmail.com

You can also contact my supervisor: Dr Tony Errichetti

E-mail: tony.errichetti@gmail.com

If you have a concern about any aspect of this study, you may wish to speak to the researcher(s) who will do their best to answer your questions. You should contact Dr Satyam Veeratterapillay on **07735253229** or satyam.veeratterapillay@gmail.com. Alternatively, if you do not wish to contact his supervisor, the contact details are as such: Dr Anthony Errichetti on tony.errichetti@gmail.com.

If you remain unhappy about the research and/or wish to raise a complaint about any aspect of the way that you have been approached or treated during the course of the study please write to Nicola Leighton who is the University's contact for complaints regarding research at the following address: -

Nicola Leighton

Research Governance Officer

Directorate of Engagement and Partnerships

IC2 Building

Keele University

ST5 5NH

E-mail: [n.leighton@ keele.ac.uk](mailto:n.leighton@keele.ac.uk)

Tel: 01782 733306

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Appendix J: Health Research Authority Approval



Dr Satyam Veeratterapillay
15 Charlotte Place
Longbenton
NE12 8NF
satyam.veeratterapillay@gmail.com



Email: hra.approval@nhs.net

18 March 2019

Dear Dr Veeratterapillay

**HRA and Health and Care
Research Wales (HCRW)
Approval Letter**

Study title: Exploring followership, hierarchical structures and barriers to effective communication during paediatric and neonatal emergency situations and resuscitation: a qualitative study

IRAS project ID: 258484

Sponsor: NHS Lead Employment Trust Health Education North East

I am pleased to confirm that [HRA and Health and Care Research Wales \(HCRW\) Approval](#) has been given for the above referenced study, on the basis described in the application form, protocol, supporting documentation and any clarifications received. You should not expect to receive anything further relating to this application.

How should I continue to work with participating NHS organisations in England and Wales?

You should now provide a copy of this letter to all participating NHS organisations in England and Wales, as well as any documentation that has been updated as a result of the assessment.

Participating NHS organisations in England and Wales **will not** be required to formally confirm capacity and capability before you may commence research activity at site. As such, you may commence the research at each organisation 35 days **immediately** following sponsor provision to the site of the local information pack, so long as:

- You have contacted participating NHS organisations (see below for details)
- The NHS organisation has not provided a reason as to why they cannot participate
- The NHS organisation has not requested additional time to confirm.

You may start the research prior to the above deadline if the site positively confirms that the research may proceed.

If not already done so, you should now provide the [local information pack](#) for your study to your participating NHS organisations. A current list of R&D contacts is accessible at the [NHS RD Forum website](#) and these contacts MUST be used for this purpose. After entering your IRAS ID you will be

Appendix K: Ethical considerations described in detail

Regarding harm, participants recalling distressing scenarios may suffer from emotional and social harm (Stewart and Filice de Barros, 2018). I ensured that they were made aware at the beginning of the interview that they could avoid answering any questions they were uncomfortable with, or opt out of the interview at any time. I also actively looked for any signs of stress to determine whether the interview should be interrupted. While I could not offer counselling in case of moral distress, I discussed with the heads of department that participants had access to pastoral support. The other concern was participants suffering professional harm through disclosure of malpractice. In those cases, the priority was patient safety and ensuring trust in the profession. I ensured within the consent form that I stated that disclosures of malpractice would have to be escalated to the head of department; however I also adopted a style and line of questioning focusing on human factors and not on any potential errors themselves to prevent inappropriate disclosures (Gillham, 2005).

Regarding autonomy, I ensured that participants were able to make independent decisions about taking part in research. I would contact the head of department and wait for them to email me back; I would then reply with an information leaflet and consent form (appendix H and I) which detailed the study and process. I would then go through the consent process again on the day of the interview and we would sign the form together on what we had agreed on. I also offered a get-out clause so that interviewees could stop the interview, or contact me to withdraw their data from the study (Stewart and Filice de Barros, 2018).

Regarding privacy, I ensured that all the data collected would be anonymised and that any identifiable information removed during the data analysis process. This was further consolidated by performing the study across 11 different sites, thus expanding the possible population from which to sample. I also ensured that I was the only person having access to the audio recording and data analysis, and ensured that any data collected during the study was kept confidential and not shared with anyone else.

Regarding reciprocity- the balance of giving and receiving in the researcher-participant relationship- this was a purely voluntary study, but I encouraged participants by ensuring that they would receive a copy of main findings at the end of my study. I also offered to hold some talks within the participating departments publishing the results of my findings at the end of the project. I ensured that I identified myself as a researcher when approaching them, and stated multiple times that this study was part of my research project and completely separate from my clinical work. This was done deliberately to prevent confusion from staff members in the units I had worked previously and believing that this was a compulsory clinical task they had to take. This also addressed the 'position of power' concern that could have occurred- indeed as a senior registrar, I am often leading resuscitation and managing more junior staff such as doctors, nurses or midwives. I therefore was

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aware that some participants may feel compelled to participate in the study due to a perceived hierarchy. By explaining the nature of my study and my role within it, I ensured that participants did not expect any remuneration or reward, nor any disadvantage if they refused to participate.

Finally, with regards to equity, I purposefully tried to recruit more junior members of staff to ensure that their voice was represented in the study.

The dissertation went through plagiarism software, and some participants were sent parts of transcripts and themes prior to final publication to ensure internal validity and prevent data falsification.

I also had robust data storage and security- the devices where the audio recordings and data analysis were kept were both passwords protected and kept in secure places. The consent forms were held in a locked filing cabinet within the NHS Lead Employment Trust office. I also limited data transfer, by ensuring I was the only person having regular access to the data.

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Appendix L: Coding and categories formation from data analysis-examples

Themes	Codes	Excerpts
Parents impacting on communication	Parent refusing to stop resuscitation	I think they were going to stop resus and then mum had a fainting episode with the stress, so that's why they got her back the second time and did a controlled withdrawal a few days later(PN11)
	No impact on communication	I feel that in that situation everybody wants to do their best for the child and you want them to survive and it's not going to change whether you have parents in the room or not(PN11)
	Affecting the ability to call-out	Would [the presence of parents] affect call-outs? I hadn't thought of it, but possibly. You don't want to undermine someone, you want the parents to have the confidence in the ability of a team leader(PD24)
	Impact on dealing with conflict	We shouldn't be having battles on babies, parents are listening(MW19)
Flattened hierarchy in paediatric resuscitation	Flattened hierarchies lead to active followers	We just knew each other. There wasn't anyone leading as such. We each suggested why not do this, why not try that. The registrar also contributed to that. (PD14)
	Flattening of hierarchy over time	I think over the last 15 years, the hierarchical structure has certainly flattened a lot more to what it used to be.(MW17)
	People not afraid to question seniority in paediatrics	In paediatrics... no one is frightened to say 'I don't think this is right# and make people think, even up to consultant level. I think we work a bit more for the child and take our egos out and a nurse wouldn't be scared to speak up to a consultant in a resus because it's about what's best for the child (PD20)

Appendix M: Strengths, Rigour and Limitations

STRENGTHS

To my knowledge, this is the first qualitative study focusing on human factors, particularly followership and hierarchy, during paediatric and neonatal resuscitation within the UK.

The main strengths of the study are that I was able to interview a range of health professions on their experience and views. Using recorded interviews lasting for 1 hour allowed me to explore multiple issues at greater depth than other methods of data gathering. The fact that I am myself a senior paediatric trainee with extensive experience in both neonatal and paediatric resuscitation ensured that I was able to verify the accounts of the participants and ensure they were authentic, as I myself had experience of issues arising during resuscitation.

I also had great rapport with many of interviewees as I had a working professional relationship with some of them. This meant that I was a meaningful contact to them, that is someone who they could trust, and they were willing to contact me afterwards for clarification of certain issues during the interview.

The final strength of the study is that previous studies have focused on one location, while my study reviewed resuscitation which occurred across different sites: this is more akin to the experience a paediatric trainee will have during their time as a junior doctor as they rotate through different hospitals and highlights the variability of leadership in different locations.

RIGOUR

To achieve credibility for this study, I performed respondent validation whereby I discussed the interpretation of some transcripts with the participants to ensure that this was the same meaning that they had conveyed. I also performed a critical peer review at the end of the study and sent a summary of my results, with some excerpts to a neonatal consultant with interest in research and resuscitation, Dr Fiona Wood. She agreed with the findings and felt they were credible for this study,

LIMITATIONS

There were a few limitations: many were related to the need to adhere to a strict timeline to ensure that the dissertation could be written, revised and submitted on time. This had knock-on effects on the sample size, and analysis of the data.

While the project plan had been agreed on in November 2018 and approval was sought from the ethical review panel and local hospitals, it wasn't until towards the end of April 2019 that the study was allowed to be undertaken. This delay was partly due to additional approval required from national bodies such as the Health Research Authority first, before seeking local approval from each local hospital's

research committee- this was a requirement for any study involving NHS staff in any capacity. Unfortunately, these delays could not have been predicted and impacted on the timeline of my study. There was also a delay in approval due to the recent change of the general data protection regulation (*Guide to the General Data Protection Regulation (GDPR)- information commissioner's office*, 2018). This meant that further assurances were required to be provided from a data protection perspective.

This meant that interviews for the study were performed between May 2019 and end of June 2019, as opposed to original time frame of at least 4 months for interviews (February to July 2019) impacting on the sample size. As a result, theoretical saturation was likely not reached in this study as there were key members that I did not manage to recruit or interview which would have added fresh perspectives to my study, namely emergency medicine consultants, emergency department nurses and nurse practitioners, anaesthetic trainees and anaesthetic consultants across tertiary and secondary hospitals. Regarding neonatal resuscitations, speaking to junior paediatric trainee's experiences would also help gaining a fresh perspective. With that in mind, I plan to recruit a further 20 participants to my study with more rigid quota sampling with at least 2 in the above categories.

Regarding sampling, I originally planned to have a majority of junior members of staff- in my study the ratio of junior (less than 10 years) to more experienced members (more than 10 years' experience) was 50:50. This was purely due to difficulties in recruitment and also partly due to one of the requirements of the study is having been involved in a memorable or recent resuscitation. I encountered few members who reported that they had not been involved in any resuscitation in the last 6 months, or were not keen to discuss it. Having a longer time for recruitment (from 2 months to 12 months) may well increase the sample number.

Regarding the methodology, some participants expressed mild surprise at the interviews lasting 45 to 60 minutes, and this may have impacted on recruitment as well- busy clinicians having to free themselves for up to 1 hour was difficult logistically. I aimed to compensate for that potential limitation by offering to meet them at a time and place of their convenience including their house which helped with some participants. I felt that a 60-minute interview was necessary to the number of issues my study was trying to tackle and the fact that this was largely an exploratory study into these aspects of resuscitation. Going forward, I would remove some demographic questions and send them prior to the interview.

The scenarios themselves when described sometimes suffered from recall bias, whereby some participants would not remember all the details of the study.

Face-to-face interviews allowed to observe people's nonverbal communication and explore with follow up questions on statements interviewees made. It also helped to have a longer time for the interview to let the participant feel more at ease and the

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format of semi-structured where the interview flowed as a conversation rather than close-ended questions gave me the impression that the interviewees were feeling relaxed and gave truthful reliable accounts of their experiences. I did wonder however whether there were cases where their accounts were romanticised. Face to face interviews have the disadvantage of privacy or anonymity concerns and participants are less likely to give honest answers to sensitive questions (MacFarlan, no date). It would be useful to have a mixture of in-depth face to face interviews, followed by anonymous questionnaires on sensitive questions to contrast the difference in answers as subsequent parts of the study going forward.

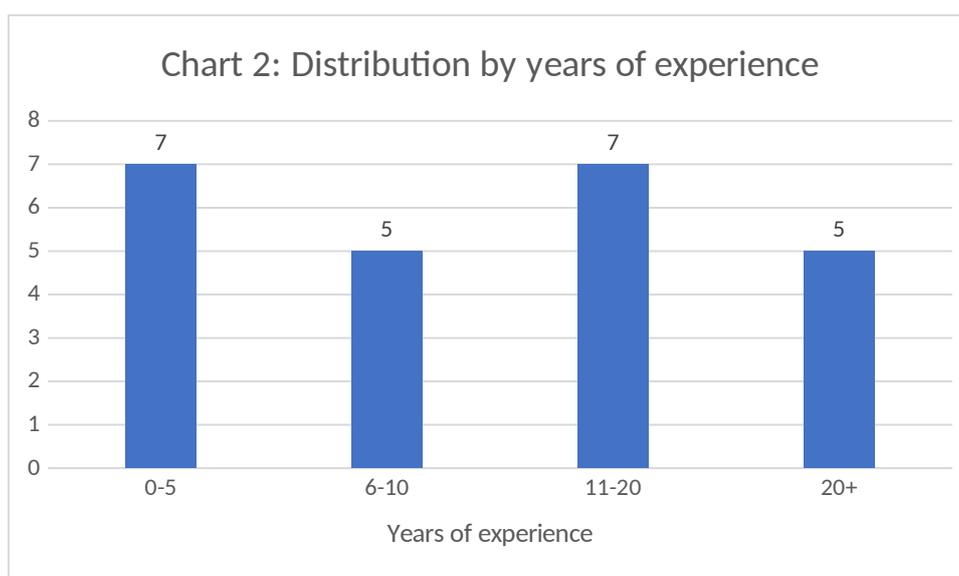
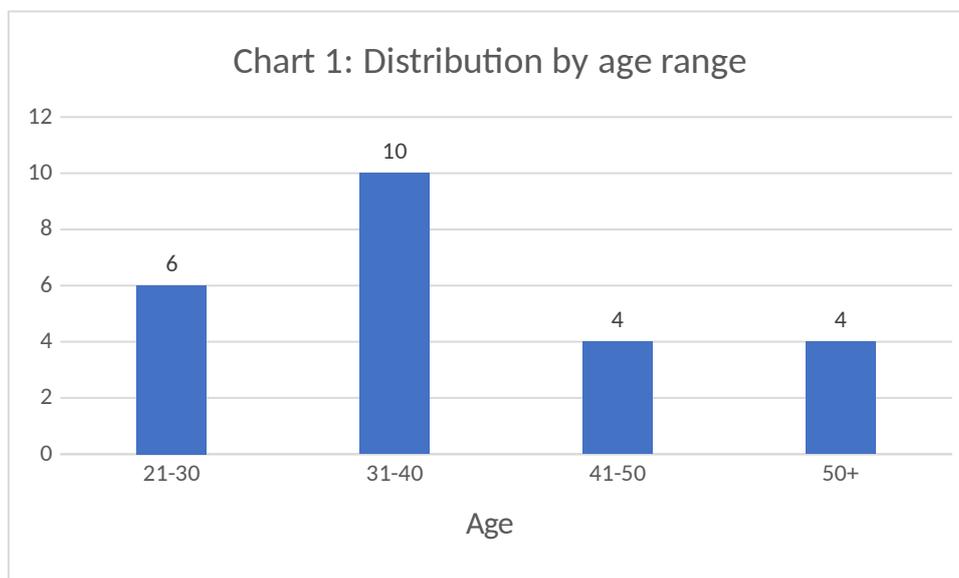
Exploring followership, hierarchical structures and barriers to effective communication during paediatric and neonatal emergency situations and resuscitation in district general and tertiary hospitals in the United Kingdom: a qualitative study.

Exploring followership, hierarchical structures and barriers to effective communication during paediatric and neonatal emergency situations and resuscitation in district general and tertiary hospitals in the United Kingdom: a qualitative study.

Appendix N: Demographic details

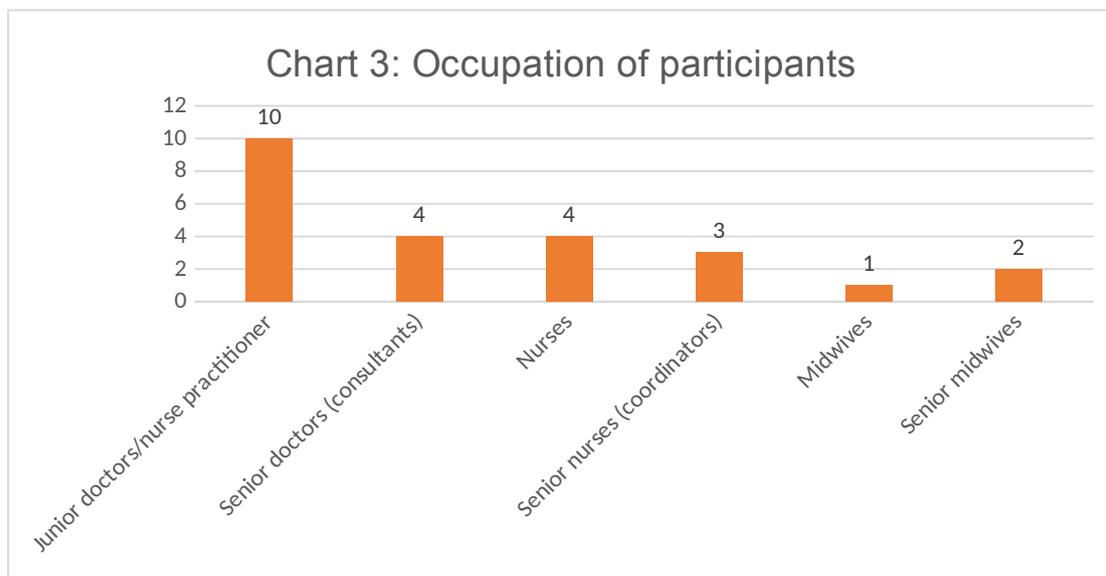
POPULATION INTERVIEWED

24 people were interviewed between April 2019 and June. The ratio of male: female participants was 3:21. Chart 1 describes their age range distribution and Chart 2 their distribution depending on years of experience. 50% of participants had less than or equal to 10 years of experience in their field at the time of interview.



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Chart 3 further describes their occupation and seniority. Senior midwives and nurses were ones who had a coordinating or supervising role on more junior nurses and not necessarily had more years of experience than their peers.



The median number of critically unwell patients that the participants managed annually was 22 and the median number of patients requiring full cardiopulmonary resuscitation was 1 annually, although participants working in the paediatric intensive care or NICU had significantly more exposure (up to 100 critically unwell patients, and 10 cardiac arrests annually).

CASES REVIEWED

Characteristics of the scenarios presented by participants are described below: 57 scenarios were explored including location, type of patient (neonate/paediatric) and whether there were any issues of communication, followership and teamwork, or hierarchy and leadership.

22 cases (39%) were neonatal patients who had required emergency resuscitation on the labour ward or the neonatal unit. The rest were paediatric cases.

39 cases (68%) were cases being managed in a district general hospital with no access to an onsite PICU or NICU.

From the interviews, there were issues with communication during resuscitation in 25 cases (44%). Examples included chaotic situations with several team members causing poor communication amongst them, nurses stating wrong drug doses during arrest situations, overburdening staff with multiple orders, failure to call-out when inappropriate care was being given or when deterioration had been observed, failure

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of handover to other team members, doctors being rude towards other members, or lack of communication between team members amongst others.

As the concept of followership and hierarchy was being explored, it was inevitable to discuss teamwork and leadership. The participants felt that there were issues with teamwork in 13 cases (24%). Examples included poor teamwork between anaesthetic and paediatric teams, poor job allocation and lack of a shared mental model during resuscitation amongst others.

They also felt that there was unclear leadership in 12 cases (21%) - this was either because the leadership changed multiple times, or it was not clearly stated at any point during the resuscitation. There were also cases where different members were perceived as being the leader by different members of staff- for example a paediatric registrar who felt they were leading a resuscitation observed that *'[whenever I gave an order] the A&E nurses were looking at the A&E registrar for their approval, or they were directing their comments to them'* (PD2) - in the A&E nurses view, they were looking up to another person as leader in that setting.

Hierarchy negatively impacted resuscitation in 23 cases (40%). Examples included a junior doctor not listening to a senior midwife during resuscitation of a neonate, an anaesthetist ignoring a nurse practitioner despite them being more experienced and practised in newborn resuscitation, or a team continuing resuscitation on a newborn at the consultant request despite all members feeling it was inappropriate, amongst others.

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Appendix O: Explanation of participant codes used

The two letters at the beginning of the code refer to the job title of the participant and are as follows:

PD- paediatric doctor

ED- emergency medicine doctor

PN- paediatric nurse

NN- neonatal nurse

NP- nurse practitioner

MW- midwife

The number at the end of the code refers to the participant number that I used during the transcription and analysis.

Appendix P: Followership profile based on experience: less experienced members are passive followers, while more experienced members are active followers or leaders

The followership profile of less experienced team members was analysed through their narrative account of the scenarios, tasks performed and attitudes. This included 2 junior paediatric nurses, 1 midwife and 2 doctors. More experienced participants were able to recall, and compare and contrast their followership profile when they were less experienced.

This showed that passive and conformist roles were more likely to be held by those members in a resuscitation: they would usually require clear instructions on what they should do, and felt most comfortable in holding less active jobs as explained by a junior nurse: *'I think as a junior nurse you're probably more passive and you'll probably want to take on passive roles like timing, [scribing] and drawing up flushes.'*(PN9). The reasons given were they felt less comfortable due to the stress of the situation and also because they felt taking passive roles supported senior members in doing more active roles. Another paediatric doctor reported that *'when I first started, I would be happy to be told what to do, because I wasn't sure [what I needed to do]. It was stressful, and you don't want people dithering. So, if [the team leader] puts me in a role, I can just go and do it'* (PD20). In 2 different neonatal resuscitations, both doctors and nurses observed that the most junior doctor remained passive throughout- *'[the junior doctor] was in an observation role- they were not involved in the active resuscitation'* (NN6). Another nurse, reported how her role changed from a followership perspective with time: *'I would have been a passive follower in the past, but I think as my confidence is getting up, I am getting more active and more involved'*(NN7).

More experienced team members had more active roles: this included initiating resuscitation, calling out deteriorations, forward planning, being able to suggest management options and being able to challenge decisions and supporting less effective team members. For example, a newly appointed senior paediatric nurse commenting on her role: *'I would suggest things if I felt that I knew the patient and why they arrested- I feel I should be able to suggest more of what I'm thinking during an arrest rather than just doing the tasks and being more passive'*(PN9). Similarly, a senior midwife commenting on her approach to a neonatal arrest: *'I would initiate basic resus... and then assist, I would get the equipment out, maybe draw the drugs up and make sure everything's there... But not to stand back and say there you go. I would love to assist, and work as a team'* (MW17). Paediatric doctors were also able to switch between different roles and support the team, although they were often the

most appropriate senior person to lead the resuscitation and would assume a leadership position.

Despite this, there were a few occasions when despite being experienced, staff members would remain passive. This was particularly true within neonates among midwives; one commented on how the situation changed her followership style: *'It depends on the situation to be honest. If it's one that I'm really confident in, then I'm proactive and I'll do what I can. Equally in another situation I'll be thinking oh I might need to do this, but then I'll wait for the instruction to do it'* (MW19), while another reported that there were usually more appropriate team members to actively participate in the resuscitation: *'there's so many people that are more experienced, I just tend to stand back and let them do it'* (MW18). Another explanation offered was that midwives were not confident with neonatal resuscitation once it had reached a stage where advanced airway techniques, chest compressions and medications were required- they would become more passive followers at that stage as the neonatal or paediatric team would take over the resuscitation.