

## IMPLEMENTATION OF STRUCTURED MULTIDISCIPLINARY TEAM TRAINING FOR NEONATAL RESUSCITATION

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### ABSTRACT

**Objectives:** To explore the experiences of participants following structured multidisciplinary team training and identify challenges towards its implementation in postgraduate training.

**Study Design:** Qualitative case study research.

**Place and Duration of Study:** Pak-Emirates Military Hospital Rawalpindi, from Oct 2017 to Mar 2018.

**Methodology:** The multi disciplinary team training was structured according to Ostergaard *et al* (2008) framework and comprised of pre-reading task, mini lecture, demonstration, reflective discussion using bad and good multi disciplinary teamwork videos followed by simulation-based exercise (briefing, immersion, debriefing and feedback). Four training sessions were conducted with four multidisciplinary teams, each comprising of residents from Paediatrics, Gynaecology/Obstetrics and Anaesthesia and a nurse. Semi-structured interviews were conducted with all the participants (n=16). Data were transcribed and verbatims were thematically analysed using O'Sullivan and Irby (2008) model.

**Results:** The participants were predominantly females (81.25%) with age range of 20-30 (62.5%) years. The multidisciplinary team training resulted in increased interest, technical competence, and communication skills. The participants reported improvement in decision-making and development as team member/leader. They experienced interprofessional learning. Some personnel, systemic and resources related challenges towards its implementation were also identified.

**Conclusion:** This study found that a structured multidisciplinary team training of postgraduate residents and nurses in neonatal resuscitation is worthwhile. The potential benefits such as improved competence, communication skills and decision-making abilities outweigh the personnel, systematic and resources related challenges. Future studies should consider multidisciplinary team training of healthcare professionals.

**Keywords:** Health professionals, Multidisciplinary, Neonatal resuscitation, Postgraduate training, Qualitative research.

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### INTRODUCTION

Traditionally health professional trainings have been dominated by 'learning by doing' (experiential learning) but it carries enormous risk to patients<sup>1</sup>. Similarly 'See one, do one, teach one' is being used at various institutes, but again it leaves room for error<sup>2</sup>. Simulation is now increasingly being used for teaching clinical skills and improving practice. A simulation is 'person, device or set of conditions, which attempts to present education and evaluation problems authentically'<sup>3</sup>. It allows the replication of clinical

encounter with varying closeness to reality; the learner is required to respond as s/he would act under natural circumstances<sup>4</sup>.

Simulations have been proven useful for team training, reducing medical errors and improving patient safety. Although learning through simulation affects its application in unpredictable situations, it stands out as the only means to allow structured repeated clinical practice in a safe environment, thus allowing room for errors and promoting ethical training<sup>3</sup>.

Pakistan has the highest neonatal mortality rate (42/1000 live births) in the World<sup>5</sup>. Birth related complications are among the major contributors to this neonatal mortality and lifelong

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morbidity among survivors, which can be reduced by effective and timely intervention. Effective neonatal resuscitation requires the integration of cognition (knowledge and critical thinking), technical skills (ventilation, intubation and cardiac compression) as well as non-technical skills (behavioural, interactive and teamwork)<sup>6</sup>. The health professionals involved in neonatal resuscitation never receive any formal training to work together in a multidisciplinary team. In real clinical practice, Gynaecology/Obstetrics resident and nurse do not have training and experience to work as team member with Paediatric resident for neonatal resuscitation at the Labour and delivery place. Similarly, an anaesthesia resident and nurse do not have training and experience to work as team member with Gynaecology/Obstetrics or Paediatric resident for neonatal resuscitation in the Operation Theatre. In all such neonatal emergencies and other crisis management situations, healthcare professionals from different disciplines need to communicate, share resources and work with each other<sup>7</sup>.

The limitations in planning, decision making, workload distribution, attention allocation and communication as a team have adverse effects on patient outcomes<sup>8</sup>. Here multidisciplinary team refers to postgraduate residents and nurses from more than one discipline of medicine (e.g. Paediatrics, Anaesthesia, Gynaecology/Obstetrics) that do not necessarily interact but all of them make complementary contributions to patient care<sup>9</sup>.

Many regulatory bodies including the Joint Commission on Accreditation of Health care Organization (JCAHO), Royal College of Physicians and Surgeons of Canada and American Academy of Paediatrics specifically recommend teamwork and communication training for all healthcare professionals working in paediatric emergency settings<sup>10</sup>. To the best of our knowledge, there is no formal multidisciplinary team training of postgraduate residents and nurses for neonatal resuscitation in our country. Basic and advanced paediatric life support courses are conducted by different government and non-government

organisations, but these courses do not train health professionals as multidisciplinary teams. A structured multidisciplinary team training of postgraduate residents and nurses in neonatal resuscitation was conducted. The objectives of this study were to explore the experiences of participants following structured multidisciplinary team training and to identify challenges towards its implementation in postgraduate training.

## METHODOLOGY

This qualitative case study research was conducted at Pak-Emirates Military Hospital, Rawalpindi over a period of six months from October 2017 to March 2018. Ethics approval was obtained from Pak-Emirates Military Hospital, Rawalpindi, Ethical Committee Ref: A/28.

A purposive sample of 16 health professionals: 12 postgraduate medical residents (FCPS first year), three each from Paediatrics, Gynaecology/Obstetrics, Anaesthesia and four nurses working in Labour and delivery room/Neonatal unit/Operation theatre were invited to participate in the study. A participants' information sheet was provided and written informed consent was taken.

The multidisciplinary team training was conducted by the primary author (SH). This multidisciplinary team training was structured according to Ostergaard *et al*<sup>11</sup> framework and comprised of a) Pre-reading task: A booklet on neonatal resuscitation based upon guidelines issued by American Academy of Pediatrics (AAP) and International Liaison Committee on Resuscitation (ILCOR), Neonatal Resuscitation Program (NRP) 7th edition, and working in teams was developed and emailed to all participants one month prior to the training session. b) Mini lecture: On the day of training, a short interactive mini lecture based upon Neonatal Resuscitation Program (NRP) 7th edition was conducted to help ensure uniform understanding and clarify any impending issues. c) A demonstration of multidisciplinary team performing neonatal resuscitation was performed in the presence of participants. d) Multi discip-

linery teamwork videos: First a bad multidisciplinary teamwork video was shown and participants were asked to identify areas of poor teamwork, reflect on its causes and areas for improvement. Then good multidisciplinary teamwork video was shown followed by a reflective discussion. e) Simulation based neonatal resuscitation exercise: The participants were divided into four multidisciplinary teams, each comprising of three postgraduate medical residents from Paediatrics, Gynae/Obstetrics, Anaesthesia and a nurse. The simulation-based neonatal resuscitation exercise comprised of briefing, immersion, debriefing and feedback. A case scenario was provided, each team was then immersed in their roles and asked to manage the case according to NRP guidelines, the activity was video recorded for debriefing and feedback was given.

All the participants (n=16) were asked to provide their demographic details on a questionnaire and then semi-structured interviews were conducted. The interview questions explored experiences of health professional following this multidisciplinary team training. Its impact on the perception of their roles in a multidisciplinary team, the anticipated impact on future practice and neonatal mortality/morbidity, the benefits and challenges towards its implementation were also discussed.

Qualitative data were transcribed verbatim in local language (Urdu). The transcripts were translated into English by a bilingual expert and then validated by translating into Urdu again by another expert. The data were thematically analysed: compiling, disassembling, reassembling and interpretation<sup>12</sup> using O'Sullivan and Irby<sup>13</sup> expanded model of faculty development as theoretical framework. The data were independently analysed by the authors and then corroborated to ensure analytical triangulation.

## RESULTS

The participants (n=16) were predominantly females (81.25%) and from age range of 20-30 (62.5%) years. Four of the participants had previously received training in neonatal

resuscitation but none had it in a multidisciplinary team (table-I).

We identified seven themes reflecting the impact of multidisciplinary team (MDT) training on learners (table-II). Most of the participants were enthusiastic and keen to participate in the training. However, their interest as well as that of their colleagues increased after the training. They also reported increased confidence and enhanced technical competence regarding neonatal care e.g. they reported learning about Positive Pressure Ventilation (PPV), measuring Endotracheal Tube

**Table-I: Participant characteristics of the study.**

Characteristics	n (%)
<b>Age</b>	
20-30 Years	10 (62.5)
31-40 Years	4 (25)
41-50 Years	2 (12.5)
<b>Gender</b>	
Male	3 (18.75)
Female	13 (81.25)
<b>Position</b>	
Nurse	4 (25)
Postgraduate Resident	12 (75)
<b>Any training in neonatal resuscitation</b>	
Yes	04 (25)
No	12 (75)
<b>Any training in multidisciplinary teamwork</b>	
Yes	-
No	16 (100)

(ETT) length, intubation, chest compression and medication skills after the training. The participants reported improved communication skills with each other as a member of MDT. The leadership roles were rotated during the training, which honed decision-making skills as a leader of the MDT. The reported identifying roles of different members of a healthcare team, they could also work in various roles as a leader or team member. The training helped the participants in knowing the intricacies of coordination among different departments, which resulted in overall improvement in multi-professional teamwork abilities. They also reported transformational changes affecting their professional identity, they developed better understanding about healthcare as they come to realise that patient outcome is

dependent on the efforts of the whole healthcare team, where everyone has to play their roles individually and as members of the team. The participants not only reported learning with each other but also from and about each other regarding their roles i.e. Interprofessional learning.

The study also identified various personnel, systemic and resource related challenges towards implementation of multidisciplinary team

conflicts which act as a barrier towards having MDT training. The participants were of the view that different disciplines have different views about multidisciplinary teamwork; hence there is a lack of standard protocols and context specific guidelines. The hierarchy between doctors and nurses can also hinder effective teamwork and in case of negligence it's mostly the nurse who gets the blame. With regards to resources, the participants reported insufficient human resources, time

**Table-II: Impact of multidisciplinary training on learners.**

Evolving interest	'My seniors and colleagues encouraged me to attend something new ... After feedback of workshop they were enthusiastic to participate themselves in the next scheduled workshop' (Female 30 Yrs.)
Enhanced technical competence	'I was shaky before ... I learned many new things about neonatal care... I have gained precision in measuring and securing ETT ... I can measure the ETT length for intubation more precisely after this workshop....I can perform PPV more accurately and effectively after this workshop.....I can calculate, prepare and inject medications i.e. epinephrine in a more scientific way after attending this workshop..... I learnt many very simple procedures like how to dry and stimulate the baby..... I learnt how to assemble and check the necessary required equipment for resuscitation of preterm babies' (Female 28 Yrs.)
Improved communication	'Now I know that during multidisciplinary team working, I should use respectable verbal and non-verbal communication..... I learnt how to use closed loop communication with other team members to minimise mistakes" (Male 42Yrs.)
Honed decision-making	'As a team leader, I learnt how to change decision according to patient's clinical condition..... I learnt how and to whom assign different roles in a team ' (Female 27 Yrs.)
Development as team member/ leader	'I learned that I can be a team member or team leader depending upon emergency situation' (Female 35 Yrs.)
Evolving professional identity	'Patient outcome depends on team performance rather a single healthcare professional ... Newborn care is not only Paed's trainee responsibility, Gynae people can also contribute in neonatal care. Bad and good teamwork videos highlighted roles of the team'(Female 35 Yrs.)
Interprofessional learning	'I learnt few nursing skills as well, like how to wrap the baby, how and when to cut umbilical cord.....I learnt about limitations of Gynae/Obs residents in resuscitation'..... I learnt that anaesthesia residents are good in intubation skills. (Female 29 Yrs.)

training in our setup (table-III). The personnel related challenges included lack of knowledge regarding use of machines and tools among the health professionals. Indifferent attitude towards those from other disciplines and lack of coordination were also reported as a challenge by participants. Among systemic challenges, the participants explained that their educational and administrative hierarchies promote disciplined based practice and training in isolation in their own departments. Also, there are departmental

constraints, equipment and lack of adequate infrastructure as challenges towards the implementation of MDT training.

All in all, the participants found multidisciplinary team training very useful and recommended that: 'such workshops must be conducted at least once a month in our hospital'. Another said: 'CPSP (College of Physicians and Surgeons Pakistan) should make this workshop mandatory for residents of Paediatrics, Gynae /Obstetrics and Anaesthesia'.

## DISCUSSION

This study explored the experiences of health professionals following multi disciplinary team training in neonatal resuscitation. The training utilised simulation, which has been found useful for MDT training by Fadel *et al*<sup>14</sup>. It was structured according to Ostergaard *et al*<sup>11</sup> framework suggesting a pre-reading task, minilecture, demonstration, videos, reflective discussion and simulation-based neonatal resuscitation exercise.

perform better in future as a team member in neonatal resuscitation. Similar findings have also been reported after other simulation-based trainings in the literature as well<sup>17,18</sup>. The important attributes of safe and competent multidisciplinary teamwork are effective communication, clear messages, clear role and responsibilities, knowledge of limitations, knowledge sharing, constructive intervention, the ability to work with different team members, honouring the contributions of all team members, mutual support and

**Table-III: Challenges towards multidisciplinary team training.**

Personnel	Incompetence	'Knowledge and expertise to operate machine and equipment is deficient..... I do not know the basic principles of MDT working' (Female 32Yrs.)
	Attitude towards other disciplines	'Doctors think they are more qualified ... nurses think they are more skilled and experienced' (Female 36Yrs.)
	Lack of coordination	'I have to look after baby alone as doctor is busy with the mother' (Female 36Yrs.)
Systemic	Isolated training	'We have been trained in isolated disciplines and do not know problem of other disciplines' (Male 31Yrs.)
	Departmental conflicts	'Suggestion offered by other departments are not accepted in our department ... Our people consider that as interference in their department and decision making' " (Female 42 Yrs.)
	Lack of context specific guidelines	'I think first we should develop SOP for MDT work, circulate among different departments and then implement' (Female 38Yrs.)
	Hierarchy	'Nurse is the easiest target for complaint' (Female 32Yrs.)
Resource	Insufficient human resource	'I have to resuscitate newborn alone as no one else is available for help' (Female 29Yrs.)
	Time constraints	'We are already over committed and do not find time for these workshops' (Female 36Yrs.)
	Lack of equipment	'Functional and latest equipment should be available ... We need to change old machines with new ones like T-piece resuscitator at resuscitation places and nursery' (Female 29Yrs.)
	Poor infrastructure	'Distance between the relevant departments and labour room should be less ... it is difficult for a resident to provide neonatal cover at distant places' (Female 27Yrs.)

Li *et al*<sup>15</sup> reported higher post-assessment scores, when a lecture was being provided before the onset of simulated scenarios in contrast to simulation only group. Although hard to assess but such structured multidisciplinary team training of postgraduates in neonatal resuscitation may also help to reduce neonatal mortality and morbidity in the long run<sup>16</sup>.

The MDT training resulted in increased technical competence and communication skills. According to participants, they would be able to

trust, leadership, crisis management and situational awareness<sup>19</sup>. The participants in the current study stated improvement in decision-making and development as team member/leader. Similar findings were also reported by Milne *et al*<sup>20</sup> in their study as well. Now the participants believe that in real situations anyone among the team members can be a leader based upon his/her leadership skills or a team member.

Literature reported a poor collaboration and conflicts among doctors and nurses in a health-

care team<sup>21,22</sup>. After the training, participants reported a transformation in the beliefs about a healthcare team and their professional identity evolved. They understood that the efficiency of team is based on the overall performance of team and not the knowledge, attitudes or skills of individuals as also reported by Siassakos *et al*<sup>23</sup>. After attending workshop participants think that an effective multidisciplinary healthcare team, mutual respect among team members is crucial for their motivation and desired performance and this thinking is also supported by literature<sup>24</sup>.

Each discipline/specialty has different expectations concerning the content, structure and methods of training<sup>25</sup>. Present education and postgraduate training system reinforce the culture of that discipline and teach little about roles, responsibilities or priorities of other sister disciplines. This creates problems where multidisciplinary teamwork is required. While and Barriball<sup>26</sup> also reported that majority of healthcare professionals have a wide-ranging concept of multidisciplinary teamwork. The participants in our study experienced interprofessional learning, they learned with, from and about each other. This helped them in understanding each other roles and boundaries better as it brings positive change in the attitude of health professionals. This knowledge and awareness of interprofessional learning has recommendation in the literature as well<sup>27</sup>. Considering the benefits, we recommend that a structured multidisciplinary team training should be inculcated in the postgraduate training of health professionals from different disciplines/specialties involved in neonatal resuscitation as supported by Lee *et al*<sup>28</sup>.

Some personnel, systemic and resource related challenges towards implementation of multidisciplinary team training were also identified. Many such barriers have been identified in the literature as well<sup>28</sup>. However, the MDT training in the current study resulted in increasing the interest of the participants and their colleagues. We believe that this increased interest towards learning about MDT along with other outcomes of such training will help overcome most of the

challenges. Participants are of the view that their discipline-based training in isolation is another challenge towards having such learning opportunities as multidisciplinary team, which needs to be changed. Our this finding is also supported by Brown *et al*<sup>29</sup>.

We report hierarchical structure in healthcare as a challenge towards multidisciplinary teamwork as also highlighted in literature<sup>30</sup>. Such hierarchy also supports isolated discipline based learning. According to some nurses the doctors think that they are senior and therefore nurses should follow their instructions. Similarly, some nurses think that they are more experienced and skilled in their profession and the doctor should talk to them respectfully and politely. Nurses felt that doctors give an impression of superiority, which according to nurses is not right, as they are also skilled health professionals. This lack of collegiality among residents and nurses is another inhibitor towards team effort and this lack of companionship has also been reported by O'connor *et al*<sup>21</sup>. MDT training of health professionals will also improve through mutual understanding and cooperation among head of departments of various disciplines e.g. paediatrics, Obstetrics/Gynae, anaesthesia and nurses in case of neonatal resuscitation. The study also reported challenges related to the infrastructure and it is parallel to findings of Weller *et al*<sup>25</sup> as well. Postgraduate training institutes through their formal, informal and hidden curriculum need to address all such challenges towards multidisciplinary team training in the healthcare institutes. We recommend developing clinical simulation centres and hiring trained staff for multidisciplinary team training exercises. It is necessary to allow health professionals a safe learning environment for practice and improvement through feedback<sup>31</sup>.

#### **LIMITATION OF STUDY**

This research was carried out on postgraduate residents and nurses from one tertiary care facility and on one procedure i.e. neonatal resuscitation. Future research should consider

MDT for other procedures and teams comprising of healthcare professionals from different disciplines and hospitals. The selected facility is under military control with better protocols and resources. Also multidisciplinary teams are commonly formed in Army during disasters and for war training. As many medical educationists and specialty experts are already available in this hospital, this may have resulted in identification of limited number of challenges in the current study, which needs further exploration.

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### Author's Contribution

Both the authors (SH and AS) were involved in the conception, study design, data collection, data analysis and interpretation. Both contributed towards drafting the article and approved its final version.

### CONCLUSION

The study found that a structured multidisciplinary team training of postgraduate residents and nurses in neonatal resuscitation using simulation is worthwhile. The potential benefits such as improved competence, communication skills, decision-making abilities and development of trainees outweigh the personnel, systematic and resource related challenges. Future studies should consider MDT for other procedures and teams comprising of healthcare professionals from different disciplines and hospitals.

### CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

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