








RESEARCH ARTICLE

Barriers and facilitators to the implementation of a national research strategy for paramedicine in Ireland: Findings from a focus group study [version 1; peer review: awaiting peer review]

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Abstract

Background

Paramedicine research and education has progressed significantly over the past two decades in Ireland. The Pre-Hospital Emergency Care Council recently commissioned a research team to develop a new National Research Strategy for Irish paramedicine. The strategy will serve to build research capacity and establish research priorities into the future. This study aims to explore the perspectives of diverse stakeholders to identify barriers and facilitators to the implementation of a national research strategy for paramedicine in Ireland.

Methods

The research employed an action research approach. Purposeful and snowball sampling was used to identify and recruit participants (n=37) from diverse stakeholders and knowledge users working in the out-of-hospital setting. Data collection took the form of focus groups (n=6) facilitated by experienced researchers. Audio recordings were transcribed verbatim using Otter AI and thematic analysis was performed in NVivo.

Results

Barriers and facilitators to the implementation of the research strategy exist at individual and system levels. The themes developed from the Focus Groups included; Challenges in the Research Landscape and Opportunities to Build a Research Ecosystem. Individual barriers included Experience and Skills, Time and Wellbeing. At system level, Operational, Educational, and Professional barriers were identified in addition to an undeveloped Research Infrastructure (Leadership, Support, Funding and Data Access). Individual facilitators included; Professional Identity, Evolving Roles and Protected Time. At system level, Collaboration, Knowledge Translation, Educational facilitators and Professional facilitators, in combination with a strong Research Infrastructure were considered important for successful implementation of the Research Strategy.

Conclusions

The findings are congruent with international studies and highlight the complexity of implementing a national research strategy aligned with the needs of diverse stakeholders in the out-of-hospital setting. Collaboration will be essential for successful strategy implementation. To ensure optimal effectiveness of the research strategy the development of an implementation plan is recommended.

Keywords

Paramedicine, Out-of-hospital Care, Research Strategy, Implementation, Barriers, Facilitators, Ireland, Focus Groups

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Introduction

Paramedicine is an integral component of health systems and refers to the emergency medical care administered to ill or injured patients, usually in an out-of-hospital setting. Traditionally, paramedics provided “pre-hospital” care to patients before transportation by ambulance to a medical facility. Internationally, paramedicine has evolved as a discipline and paramedics now work across clinical settings in diverse roles such as emergency care, primary care, and public health¹. In most jurisdictions vocational education and training in emergency medical services (EMS) has transitioned to a higher education model. It is well accepted that increased research activity benefits service-users, staff, and organisations. However, research can be uniquely challenging in the unpredictable out-of-hospital environment. Subsequently, an evidence-based body of knowledge has emerged more slowly in paramedicine. Internationally, this has driven the development of national paramedicine research agendas in an effort to build research capacity and culture in the field²⁻⁶.

In Ireland, important milestones for the paramedic profession include the foundation, in the year 2000, of a statutory regulator, the Pre-Hospital Emergency Care Council (PHECC), the publication, in 2008 of a national Prehospital Research Strategy⁷ and the graduation, in 2016 of the first Irish degree-educated paramedics⁸. The PHECC Strategic Plan states that “Focused Research” is a key goal and highlights the importance of developing research capability and capacity in pre-hospital emergency care⁹. The PHECC Research Committee has committed to the publication of a Research Strategy in 2024 and recently commissioned several research projects to inform the development of this strategy¹⁰.

A recent scoping review of out-of-hospital literature published in Ireland over the past 20 years found that research to date has predominantly focused on clinical areas such as resuscitation and that the evidence was mainly generated by non-paramedics (i.e. doctors and non-clinical researchers) with paramedics rarely named as first or senior author on research outputs¹¹. Additionally, most Irish research was disseminated through abstract presentations at conferences but was not subsequently published in academic journals¹¹. These findings highlight the need for a more strategic national approach to paramedicine research in Ireland which could drive a diversification of research topics, an increased emphasis on paramedic research leadership and the conduct of high-quality research with the potential for academic publications and knowledge translation.

A Delphi study was also recently undertaken to establish the future priorities for paramedicine research in Ireland¹². Research priority areas that reached consensus included Staff Wellbeing, Education & Professionalism and Acute Medical Conditions. In terms of resources required for research, participants considered Education, Staffing and Leadership to be “imperative”. Education was also deemed “imperative” as a Key Process Change to enable future paramedicine research in Ireland. The Outcome Measures reaching consensus for

inclusion in the new research strategy were Patient Outcomes, Practitioner Development, Practitioner Wellbeing, Alternate Pathways, Evidence-based Practice and Staff Satisfaction¹².

The identification of these research priorities is an important step to inform the future paramedicine research agenda in Ireland and ensure that the knowledge developed has policy and practice implications for patients, services and the public. It is essential that research is relevant and beneficial to knowledge users and the advantages of engaging experience-rich participants in research design are well established¹³. Therefore, the aim of this qualitative study was to consult with knowledge users to identify barriers and facilitators to the implementation of a national research strategy for paramedicine in Ireland.

Methods

Ethical approval

The study was performed in accordance with the Declaration of Helsinki ethical principles for medical research involving human subjects¹⁴. Ethical approval was obtained on 14th December 2022 from the Education and Health Sciences Research Ethics Committee at the University of Limerick (Ref. 2022_01_01). Written, informed consent was obtained from all participants prior to enrolment in the study and was repeated at the start of the Focus Groups to ensure participants remained well informed of the risks and benefits of participation and made aware of the option to leave the study.

Study design

The study employed an action-research approach in the form of focus groups. This approach allowed participants to be involved as experts of their own lived experience. The researchers adhered to the Consolidated Criteria for Reporting Qualitative Research (COREQ) guidelines to standardise the conduct and reporting of the study¹⁵.

Study context

In the Irish setting, out-of-hospital care is mainly provided by PHECC registered practitioners who practice autonomously with support from other healthcare professionals¹⁶. The statutory ambulance response is delivered by the National Ambulance Service (NAS) and Dublin Fire Brigade. Auxiliary, private and voluntary services also provide out-of-hospital care. The PHECC register includes Emergency Medical Technicians (EMT), Paramedics, Advanced Paramedics (AP) and more recently Specialist Paramedics (SP)¹⁶. Currently, paramedics in Ireland undertake a BSc programme and provide a range of care options including assessment, interventions and medications. APs are educated to MSc level and provide additional expanded assessments, interventions and medications. The SP is a new role in Ireland and requires specialist training and a MSc to practice as a Critical Care or Community Paramedic¹⁷. For the purposes of this study the term “paramedic” refers to all levels on the PHECC Register. Outside of specific roles, current Irish legislation and clinical practice guidelines dictate that treat and referral can only be applied in certain instances, meaning that paramedics are obliged to

transport all patients who call for an ambulance to the Emergency Department (ED), unless the patient explicitly refuses transport. However, in recent years alternative care pathways to the ED have been developed (e.g. the Pathfinder model) in line with Sláintecare and international best practice¹⁸.

Study setting

The setting for this study was a Health Research Board (HRB) funded research seminar which took place at the University of Limerick in January 2023 entitled “*The Past, Present and Future of our Emergency Medical Services: Stakeholder Consultation on the Implementation of a National Research Strategy for Paramedicine in Ireland*”. The programme for the seminar included an overview of Irish out-of-hospital research published to date which was followed by an education and research update from PHECC. The research priorities (identified in a Delphi study) which will form the basis of the national research strategy for paramedicine were presented to the participants. Focus groups provided a forum for consultation with knowledge users on the barriers and facilitators to the implementation of the new strategy. International Key-note Speakers shared information on paramedicine research priorities and strategy development across jurisdictions. The seminar concluded with an Inter-professional Panel Discussion facilitated by national representatives from Paramedicine, Emergency Medicine, Nursing, General Practice, Allied Health and Public Health.

Recruitment and sampling

The study employed a purposive sampling approach, with additional snowball sampling. Inclusion criteria were that each participant worked in the field of paramedicine or had an interest in paramedicine research. There were no specific exclusion criteria for the study. Potential participants were initially identified by liaising with PHECC regarding key stakeholders and opinion leaders in the field. Authors of published pre-hospital research were also contacted regarding participation and an invitation was issued to all practitioners registered with PHECC as having an interest in clinical research. Recruitment was conducted via email and prospective participants were sent an information leaflet and consent form to review prior to enrolment in the study.

Participants

The research seminar was attended by n=50 invited clinicians, researchers, managers, patient representatives and policy-makers from the Irish paramedicine community. The research team comprised six focus group facilitators. A small number of attendees were unavailable or declined to participate in the research study (n=7) which resulted in a total sample size of n=37 for the focus groups. In terms of demographics, 68% of participants were male and 32% were female, with 84 % of participants having a clinical background (Paramedicine 62%, Medical 8%, Nursing 8% and Allied Health 5%). The non-clinical participants included policy-makers, researchers and patient representatives. In terms of Patient and Public Involvement (PPI), while there was patient representation at the focus groups unfortunately, it was not possible to include a patient representative in each group due to lack of availability.

Procedure

The focus group question guide was developed collaboratively based on the clinical and academic experiences of the research team. While the question guide was not formally piloted, it was reviewed by all team members and agreed by consensus. Each focus group was hosted by an experienced facilitator from the research team (AMB, A-MB, BD, CF, MOT and NMC) who was responsible for data collection. The focus group facilitators comprised two male and four female researchers and included three paramedics, two nurses and one non-clinician. All researchers held MSc or PhD qualifications with expertise in paramedicine, and all worked in academic institutions in lecturing (n=3) or research (n=3) roles. The facilitators were the only attendees present at the focus groups alongside the participants. Researchers introduced themselves briefly at the start of the focus groups to provide an insight to the participants on their backgrounds and reasons for undertaking the research. Relationships were not formally established between the research team and the focus group participants prior to initiation of the study. However, in some cases researchers and participants were familiar with each other through professional connections. During data collection, the researchers endeavoured to avoid leading language or sharing personal experiences while also maintaining empathy towards the participants. Initial observations were recorded and live field notes taken by the researchers during the course of the focus groups. The sessions were audio recorded and recordings were digitally transferred to a password protected device with cloud storage (OneDrive). The audio recordings were transcribed utilising the transcription function in Otter AI and subsequently verified by revisiting the recordings. Participants did not check transcripts after data collection. The focus groups varied in length from 67 to 79 minutes.

Data analysis

Transcribed notes were entered into qualitative analysis software (NVivo 14; Aquad is an equivalent open access software that can perform analysis of unstructured text from Focus Group discussion) to support the data analysis process. A reflexive thematic approach to analysis was employed to provide a rich and detailed account of the data¹⁹. Analysis was performed by three female researchers (NMC, CF and UMC) with three transcripts initially coded independently and discussed to explore different perspectives from the researchers, as opposed to seeking consensus. All data were then coded by one researcher (NMC). In keeping with guidelines on reflexivity, the researchers critically evaluated the impact of their position (personal characteristics, beliefs and relevant experiences) on the research process²⁰. In summary, CF and UMC have nursing backgrounds and work in the academic setting as researchers with expertise in emergency care. NMC has a non-clinical, scientific background and works in the academic setting as an educator and researcher with expertise in emergency care and paramedicine. All three researchers have strong knowledge of the out-of-hospital care setting in Ireland. An inductive approach to content analysis was undertaken linked to the research aim. The six-stage guide to reflexive thematic analysis described by Braun and Clarke was adhered to in this study¹⁹. The first phase

involved a process of familiarisation with the data through repeated reading of the focus group transcripts. In the second phase, initial codes were identified by NMC, UMC and CF which were subsequently sorted into potential initial themes in the third phase. These were reviewed and discussed by NMC and CF in the fourth phase to ensure all themes had internal homogeneity and external heterogeneity. In the fifth phase, themes were named and defined while the final analysis and write-up of the findings (with supporting quotes) comprised the sixth stage of the framework. To mitigate bias in the study and demonstrate trustworthiness and rigour the researchers applied methods to ensure transferability, confirmability, credibility, and dependability²¹ (Table 1).

Results

Barriers and facilitators to the implementation of a national research strategy in paramedicine exist at individual and system levels and the overarching themes developed from the focus groups included; Challenges in the Research Landscape and Opportunities to Build a Research Ecosystem (Figure 1).

The first theme developed was “Challenges in the Research Landscape” and Individual barriers included Experience and Skills, Time and Wellbeing (Figure 2). At system level, Operational, Educational, and Professional barriers were identified in addition to the fact that the Research Infrastructure remains undeveloped with limitations in Research Leadership, Support,

Table 1. Criteria for Demonstrating Trustworthiness in Qualitative Research²¹.

| Criteria | Methodology |
|-----------------|--|
| Transferability | <ul style="list-style-type: none"> Reporting of the research design, process and participant demographics transparently with sufficient detail allows for the recreation of the study. To ensure that rich data could be obtained from participants the sampling and recruitment methods are described in detail. The researchers recorded detailed field notes to ensure rigorous documentation of the study process |
| Confirmability | <ul style="list-style-type: none"> Participant demographics were described to give context, relevance and depth to the findings. This enhances the generalisability and significance of the results. Direct quotes from participants were included to demonstrate that findings were not biased by the researcher but were representative of the raw data The researchers recorded detailed field notes to ensure rigorous documentation of the study process |
| Credibility | <ul style="list-style-type: none"> Ethical approval was granted for the study and the informed consent process was robust The researchers were experienced and skilled in the conduct of Focus Groups. Prior to participation in the focus groups participants were apprised of the role, qualifications and experience of the researchers to enhance credibility of approach. Participants were informed of the overall aim of the study and the risks and benefits of involvement. At the beginning and end of the focus groups the participants were invited to ask questions and contact details for the research team were shared should any queries or problems arise. |
| Dependability | <ul style="list-style-type: none"> An audit trail was established describing the research procedures and processes in the study protocol and field notes. |

Theme 1. Challenges in the Research Landscape

1.1 Individual Barriers

- Experience and Skills
- Wellbeing
- Time

1.2 System Barriers

- Operational Barriers
- Educational Barriers
- Professional Barriers
- Research Infrastructure (-)

Theme 2. Opportunities to Build a Research Ecosystem

2.1 Individual Facilitators

- Professional Identity
- Evolving Roles
- Protected Time

2.2 System Facilitators

- Collaboration
- Educational Facilitators
- Professional Facilitators
- Research Infrastructure (+)

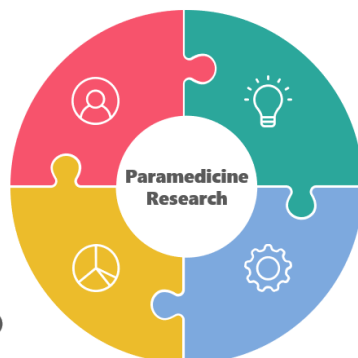


Figure 1. Coding Map.

1.1 Individual Barriers

- Experience and Skills
- Wellbeing
- Time

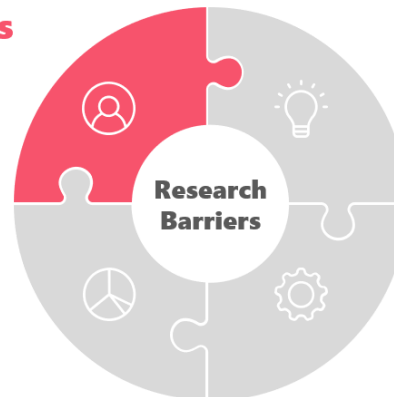


Figure 2. Challenges in the Research Landscape – Individual Barriers.

Funding and Data Access (Figure 3). The second theme developed was “**Opportunities to Build a Research Ecosystem**” and Individual facilitators included; Professional Identity, Evolving Roles and Protected Time (Figure 4). At system level, Collaboration, Educational Facilitators and Professional facilitators were identified combined with a strong Research Infrastructure and guided by a Research Strategy (Figure 5).

Theme 1. Challenges in the research landscape

1.1 Individual barriers

Experience & skills

Experienced paramedics bring a wealth of clinical knowledge to the role and it was felt by participants that it would be important to support this cohort to engage in research. However, it was also acknowledged that paramedics with many years of service may find research more challenging because it was not originally part of their role.

“The idea is how we put a value on it to get someone that’s doing the job for 25 years to engage in research” (FG2 P7)

“It takes a level of bravery to put yourself out there to do something like that if you haven’t done anything academic for years” (FG3 P2)

Many participants expressed a lack of confidence, to the point of fear, around research. This was particularly the case for paramedics who had not engaged in formal education for a number of years. There was a lack of confidence particularly regarding IT skills and academic writing skills.

“The fear of not being supported, there’s the fear of making an eejit of yourself, you know, there’s still a fear out there for a lot of people of academic writing” (FG6 P4)

“I haven’t used the computer in 20 years, I have the ideas but I don’t know how to do this... Don’t ask me to sit down in

front of a computer to write. Terrifying. I would be terrified to start the process” (FG1 P3)

Wellbeing

The participants acknowledged the inherent difficulties of the paramedic role and the impact this can have on personal wellbeing. The perception among participants was that employers were not concerned about their wellbeing, but that fellow paramedics understood and cared for each other.

“It’s not a healthy job for your average person, because you’re dealing with everybody else’s worst day. So there’s a level of unhealthiness within the job that is part of the role” (FG1 P3)

“Everyone knows that no one actually cares about staff wellbeing. We all care about each other, but you know nowhere else cares about it” (FG6 P5)

The unpredictable nature of the paramedic role makes work-life balance particularly challenging. Participants highlighted the impact this work environment has on family life.

“The Ambulance Service they can’t go home until they start to transfer their patient and then hope that they don’t get a call for a cardiac arrest on the way back... it’s the one area of healthcare that you can’t leave until you’re finished” (FG3 P5)

“You need to have very understanding partners, homes and, family because you know you’re saying I’ll be home at 9 to mind the kids or put the kids to bed, and you’re ringing your partner at 9 o clock saying ... I might be home before 12 all going well. And then unfortunately it’s a symptom that you see relationships break down” (FG3 P4)

Fear of stigma and a traditional code of silence persists amongst paramedics in relation to mental health difficulties

1.2 System Barriers

- **Operational Barriers**
- Service Capacity
- Staffing Issues
- **Educational Barriers**
- Lack of Upskilling Time
- Teaching Models & Assessments
- **Professional Barriers**
- Scope of Practice
- Culture
- **Research Infrastructure (-)**
- Limited Research Leadership
- Limited Research Support
- Lack of Funding
- Data Access Issues



Figure 3. Challenges in the Research Landscape – System Barriers.

2.1 Individual Facilitators

- **Professional Identity**
- **Evolving Roles**
- **Protected Time**



Figure 4. Opportunities to Build a Research Ecosystem – Individual Facilitators.

2.2 System Facilitators

- **Collaboration**
- Co-operative Working
- Knowledge Translation
- **Educational Facilitators**
- Higher Education
- Dissemination
- **Professional Facilitators**
- Autonomy & Policy
- Professional Voice
- **Research Infrastructure (+)**
- Research Leadership
- Research Support
- Research Funding
- Research Data
- Research Strategy



Figure 5. Opportunities to Build a Research Ecosystem – System Facilitators.

and participants reported that this is perceived as a weakness or inability to perform their role. Stigma also exists around involvement with mental health research.

“From a wellbeing point of view, it’s always been kind of well, if you can’t manage it, you shouldn’t be doing the job, we need to move away from that idea of managing. So what can we do to help you manage it?” (FG2 P4)

“There are complications about being involved in research and especially with mental health ...I think it comes back to culture again, to address that culture of repercussions from participation in research specifically to do with mental health” (FG2 P8)

Participants highlighted the fact that burnout among staff was only recognised in extreme cases when the paramedic was no longer able to work on the ambulance due to illness.

“Staff wellbeing is on ongoing issue and in the current climate...with significant shortages of staff we’re seeing huge burnout with ED turnaround times” (FG3 P4)

“I think there’s a vacuum of wellness. In reality, it only becomes an issue when we fall off the wagon. And then we start to break down. We’ve had umpteen cases in our service” (FG1 P4).

Participants described the moral hazard of taking time off frontline care to undertake research as this added to the pressure on their colleagues.

“That moral hazard, you know, if you go off and do that (research) who’s going to be there? Are you leaving the lads in the lurch, you just going to go in and do the extra hours anyway. So that compounds the burnout because then you’re trying to do all the shifts, even where you can get time off, and you’re not really taking it because the guilt is too much so I’ll never write that paper” (FG6 P5)

“When I had the Masters done I had my fill of it and I needed some headspace and time rolled on. I didn’t publish” (FG4 P6)

These challenges were reported to contribute to staff retention issues and there was some sense from participants that the current working model for paramedicine was not sustainable in terms of staff wellbeing but there was also some cautious optimism towards the future.

“People are actually leaving the job, going into much lesser paid jobs, for better work-life balance”. (FG3 P4)

“Everyone wants it to be better, We all need it to be. It’s not going to be like this in 20 years (FG6 P5)

Time

Participants discussed how time was a significant barrier to undertaking research as ambulance shifts often extended past rostered hours. The heavy clinical workload also left little time for the associated administration during work hours, meaning

that this had to be completed by the paramedics on their own time.

“Currently we work a 12 hour shift. We don’t finish at 12 hours, ever.” (FG6 P4)

“I can’t get my own paperwork done, I have to do it in the evening and that’s not right” (FG4 P6)

It was agreed that this type of working environment meant that there is very limited capacity for research in the paramedic cohort.

“I’m sure everyone across this table has fantastic research ideas, but don’t have the time, the bandwidth or, you know, just the wherewithal to do it at the moment” FG1 P5

“It’s nearly punitive to conduct research, on both a personal and professional level” FG6 P4

1.2 System barriers

Operational barriers

Service capacity

Participants acknowledged that in recent years there was a higher level of integration with the wider health system.

“Now the ambulance service is starting to link in and merge more with the health service that they’re part of but they never did before... We were always part of the health service, part of the HSE, but we were on our own. See now where I think what really integrated us more than anything was probably COVID” (FG3 P5)

Paramedics described the effect of broader health system challenges on their role and expressed frustration at the challenging work environment they faced in overcrowded Emergency Departments (ED). Prolonged ambulance off-load delays did not align with paramedics expectations of the role and created a sense of futility associated with waiting for handover.

“When you sign up to be a paramedic for all the blood, guts and glory, you sign up to be doing calls, on the ground work, not being (delayed) in the hospital for hours” (FG3 P4).

“I would describe myself as being an ED wallflower standing in ED for 10 or 12 hours. So, we broke a record a few weeks ago we had someone standing with a crew in ED for 12 hours, well sorry outside ED in an ambulance for 12 hours” (FG3 P4).

Regarding service utilisation, the participants outlined that some patients may not accurately report symptoms during emergency calls. There was also a perception that other patients felt a sense of guilt at using the busy service when they genuinely need help, but are not critically ill.

“There’s nothing in public relations about if you call an ambulance, you’re not necessarily going to be faster, that it depends on your triage category. Then at the same time the message is getting out that if you’re ready to say breathing issues then you get seen faster. (FG1 P3)

“I’m here on the floor, I can’t feel my legs because I get muscle spasms in my back.. I know I’m not a priority for them, but still lying on the floor I’m getting cold and I need pain relief. So this is my only option. You’re not an emergency, an emergency is a car accident or a cardiac arrest” (FG5 P5).

Staffing issues

Issues around staffing lead participants to highlight challenges in maintaining core rotas for frontline care, which was perceived to result in staff frequently requested to work during periods of scheduled leave.

“Personally, from my perspective, in the service that I’m in, we are struggling to keep our heads above water, research is probably the last thing on our mind, it’s just trying to put bums on seats” (FG5 P2)

Participants recognised that service provision is the priority and subsequently, inadequate staffing levels mean that paramedics cannot engage in research in addition to their clinical work.

“You’re not getting the same time with patients, you’re not getting the same interaction, and you’re not getting it done... just get them into the ambulance, get them into the hospital. Onto the next one. Because there’s no ambulances, because there’s no staff” (FG1 P3)

“It’s all about having people, you can’t have people to run the service, you can’t have people to give enough information to do the research, to be involved in the research process. Because if you don’t have enough people doing it, you can’t do it at all” (FG5 P5).

Educational barriers

Lack of time for upskilling

Participants acknowledged that service provision was a priority but felt that time should also be dedicated to education and research as a means to improve patient care.

“I know that’s not the case but it almost sends a message that training is important but only when we have core rota, research is important but only when I know why, I know it’s the patient’s safety but it’s almost getting to be, it’s a total culture. Yeah, it’s only important when we have all these boxes ticked when really it should be important regardless” (FG3 P2)

The wider advantages of research for services was noted and participants expressed the belief that dedicated time should be allocated to CPD.

“Education is really the process to enable operations. Yes. And if you pull the plug on education, or when you minimize it, then operations will suffer in the long term” (FG1 P2)

Teaching models and assessments

Issues with current teaching and assessment models exist in the discipline. Regarding teaching, it was reported that the focus was on passing exams with limited emphasis on the evidence supporting theory.

“I don’t think I’ve heard any instructor or tutor saying, this is the information, here’s where the research is at the moment. They’re saying we have 15 weeks, here’s the education standard, and because we need to get people passed are saying, there’s no need to know that data” (FG1 P4)

The requirement for paramedics to pass separate exams for the regulator and for universities was highlighted as an issue that was unique as a paramedic training in Ireland.

“The barrier is the need to do the exam with the regulator, which is unusual of itself, because you don’t have to do that in nursing, in medicine, you do it with the university so it’s the exam that’s forcing the bottleneck” (FG1 P5)

Professional barriers

Scope of practice

Participants discussed a perceived imbalance between the focus of responding to emergency calls versus calls of a more social and mental health focus, which some referred to as calls requiring “soft skills” (FG1 P4).

“Less than 10% of our work... is the critical care job - the big job. These days, it’s 90% mental health, care of the elderly, end of life. And these are all really important and cases of lower socioeconomic status and homelessness” (FG1 P1)

“The trauma and the cardiac arrest are always kind of higher priority because they’re time critical, but I agree with what you’re saying 90% of the work is not that now” (FG1 P2)

This lack of focus on non-technical skills was more apparent for newly recruited staff members, highlighting a gap in the expectations and reality of the role, which some felt stemmed from the education focus of newly qualified staff.

“For someone that just arrived in all enthusiastic you know, bandages, blood and bandages let’s go, and I’m here listen lad, you’re going to see more vomit than you’ll ever see blood” (FG2 P4)

Concerns around licensing and autonomy limited participants scope of practice which then contributed to patient capacity issues. This was also a source of frustration for their hospital colleagues who perceived it as contributing to ED crowding.

“I think that links again, with professionalization and proper registration. And that’s no reflection of fact, that’s just the legislation set up. Also it’s autonomy and practice that I can

work in Belfast as a registered paramedic, as long as I have indemnity insurance but I can't work outside of the ambulance service here (in Ireland) unless I have a license and the Medical Director says it's ok" (FG1 P5)

*"I remember bringing somebody into hospital... it was something simple but he didn't need to go to hospital... at 3 or 4 o'clock in the morning I bring him into hospital and the doctor said, what's wrong? And I explained and he just looked at me and said why in the name of **** are you bringing these people in? And I said you know as well as I do my hands are tied I would've given anything not to but if that person decides to come in I can't stop them"* (FG1 P3)

Culture

The value of research was reportedly under-appreciated across all levels and roles resulting in a lack of opportunities to participate in research. Participants felt that management did not see value unless it had financial implications in the short-term for the service. It was stated that education on the value of research would be useful to highlight how research can benefit paramedics themselves, in addition to benefiting the service and improving patient outcomes.

"I think more of a barrier is a lack of opportunity" (FG3 P5)

"When you talk about organisational buy in, culturally it's not happening if they don't see the value of it, the given value for money and if it's not tangible now. Yeah, it's something that will give us value in 10 years time... I don't see getting to do research, 39 hours on research, it's never going to do any good, it won't go anywhere" (FG5 P2)

"We need to have an educational program, they may not be researchers, or they may not want to be researchers, in that sense, but to let them see the value of research and how it can actually enhance their job, their role, their status, whatever is going to make it work for them" (FG1 P2)

It was generally felt by participants that organisations did not "buy-in" (FG5 P2) to research which was another barrier to their participation. Participants believed that an organisational culture that does not value research could make implementation of a research strategy in paramedicine very challenging.

"Our employers don't want to know, they don't want to hear, they're not interested. And they don't want to hear if you want to do something. So from the bottom it is just barrier after barrier after barrier on top" (FG6 P6)

"Culture eats strategy for breakfast, and organisational culture is a huge issue" (FG6 P3)

Participants discussed how several misconceptions exist around research, with some reporting that students have a stereotypical view of a researcher as being a scientist working in a laboratory. A common misconception was the belief that research was solely the preserve of academics in 'ivory

towers', which deters frontline clinicians from engaging in research.

"What we tried to do with the students is give them an understanding of... why do we do research, because the vast majority have no idea, like a white coat and mice or something" (FG2 P7)

"There's a belief that it's for academics only. And if that's the belief, and that becomes the status quo then we don't tap into people on the frontline, at the coalface" (FG6 P4)

Undeveloped research infrastructure

Limited research leadership

Participants expressed the opinion that there was limited leadership in relation to research within the paramedicine field and highlighted that most research conducted to date in the field was not led by paramedics, but by researchers from other disciplines.

"I found it interesting that the majority of research at the moment... is physician-led or by professional researchers, as we call them" (FG2 P2)

The need for senior leadership to support paramedic researchers in their decision-making was also discussed.

"You need higher level decision makers supporting those people... they need senior support and decision makers and clinical supervision and advisors to actually help them make good decisions" (FG5 P2)

Limited research support

Support for paramedic research was considered poor with one participant stating that research was currently a solitary pursuit in the absence of an adequate support structure nationally.

"If you want to do research, do it on your own. That's the reality anybody who's doing research in EMS in Ireland they're doing it themselves, they're not getting any help" (FG3 P5)

The lack of a support system was considered to be one of the most significant barriers to participation in research.

"I think the biggest barrier of entry for a lot of people I know is, is the structure and support" (FG6 P4)

Lack of funding

Financial investment in research was deemed a barrier by participants. It was felt that management would have a more positive view of research if funding was available for research positions, as this would ease the pressure on service provision.

"They are so stretched in manpower and resources, they just see it as another headache. But I think if there was research positions that were circled, you know, for funding, then at least they don't have to worry about funding" (FG1 P2)

Participants also highlighted the fact that a lack of funding limited the scale of research projects that paramedics could undertake and consequently, the research was less likely to be impactful.

“I think funding is always the thing... See, then you’re ended up doing it in your own time unfunded. And that means that your output of high-quality research that will actually change strategy, change the direction is not there, there’s a lot of low-quality data” (FG6 P5)

Data access issues

Participants reported challenges around data access for research and expressed frustration at their inability to progress research due to this issue.

“It was just like hitting a wall. So yeah, that access to data information is really, really difficult” (FG2 P4)

They reported confusion around participation in research and permission issues such as data access and confidentiality.

“I think there’s a lot of confusion for people in relation to if I want to access x data, or y data or talk to these people, or those people, or what can I talk about or not talk about” (FG5 P2)

Participants also cited a lack of data integration and linkages between IT systems across clinical settings as a barrier to research.

“Data integration. So how do I take CAD dispatch data? ePCR data and hospital admission data and emergency department data the whole way through to the hospital inpatient stage discharge, readmission? How can we bring all those together?” (FG4 P1)

Theme 2. Opportunities to build a research eco-system

2.1 Individual facilitators

Professional identity

The professional identity of the paramedic role and its value was recognised across the focus groups. A sense of pride was evident from the paramedic participants at serving their role in the community, both in terms of acting as a safety-net for the wider health service and in terms of the personalised care paramedics provide to patients during transport to hospital.

“The ambulance is a backstop... if somebody needs care, somebody in society is going to come out to help you” (FG1 P4)

“Often it’s ambulance personnel who are the first point of contact with services (for patients), and often they’re only prolonged one-on-one contact with the health service at all... we could be with them 2, 3 or 4 hours and you are the one person looking after them when they might not ever get that again within their stay in the hospital or in the health service” (FG3 P1)

It was clear that the unique skillset of paramedics was appreciated by colleagues in other health professions who were also participants in the focus groups.

“Emergency personnel you’re there at kind of real life-changing moments in people’s lives. I remember one where a child fell off a bouncy castle or trampoline and couldn’t feel her legs and you’re thinking my God that’s the start of a journey and you guys have to steer the family through this for the next half hour or forty-five minutes and I just thought what a skillset, you don’t capture that in a Clinical Practice Guideline” (FG3 P6)

Paramedics are also one of the few healthcare professionals that now see and treat patients in their own environment. This was considered highly beneficial by participants who highlighted the advantages of seeing the ‘unvarnished’ realities of daily life for their patients.

“We are the people who see the bags and bags full of medications, we see the 15 boxes of Solpadeine that they’re not actually taking. We are the people who have the chance to break that down in our paperwork and hand it over to (ED) staff and say, they have too many of this medication.” (FG3 P1).

The education of paramedics entering services has changed over the past number of years and participants acknowledged that the role was becoming more academic. This shift in the education underpinning the profession was seen to better support paramedics to become involved in research.

“People that are joining the service now are more educated coming into it. As opposed to, we would have joined quite a few years back, it’s not the same job that we entered into, there’s a lot more a lot more of an academic side to it” (FG2 P5)

Evolving roles

Participants were universally positive about the introduction of Alternative Care Pathways (ACPs) in paramedicine both from a patient care perspective and from a career development perspective.

“I think those alternative care pathways are hugely important. We’ve all experienced those blockages for patients getting the right care” (FG1 P4)

“We’re at a point of change in relation to what Paramedicine is going to look like going forward” (FG5 P4)

The move towards ACPs was seen as a positive reflection and recognition for the paramedic role within the broader health system context, with a general sense that this was a constructive development both for staff and patients.

“I think that’s where we’re going with professionalism, we’re going to have (paramedic) roles embedded in services. They’ve already started with the community paramedic and the

likes of the alternative care pathways, and integrating with community services” (FG3 P3)

“That’s not an ambulance service issue. It’s a bigger issue, it’s not an ED issue at all. I feel that the Department of Health know what the issues are and they are putting a lot of money now into community services, and trying to keep people at home. I think that is happening. And hopefully in 5–10 years time, we’re not going to be taking patients into hospital that shouldn’t need to come.” (FG3 P5)

One of the participants highlighted an equality, diversity and inclusion issue around the lack of career options for female paramedics during pregnancy.

“In terms of investing in people, particularly in families, say, female paramedics who are off the road because they’re pregnant, or before they go on maternity leave, there’s not a role for them... There’s not specific roles or new skills you can do or new training you could get into it’s like, this is an admin job that maybe didn’t really exist before, and then you’re losing that specific opportunity... “It’s about having roles available and to use those peoples skills” (FG3 P1)

Participants discussed how different career pathways could facilitate research, or reciprocally how research could be an alternative career option.

“We’ve been discussing the apprenticeship model. I think you could get people to a certain point in their apprenticeship and clinicianship, if you like, between not while they’re on the road and doing cases to when they’re finally degreed. Is there a space in there that could have a research element for everybody?” (FG1 P4)

Protected time

Participants discussed the value of protected learning time, which they noted was available to some of their counterparts in the wider health service.

“Within the HSE system, they allow you to further your education with time off to learn and release you from your shift pattern as well as requirements but not in the ambulance service” (FG6 P6)

“It’s protected learning time. And so and that’s where your education, professionalism, and staff wellbeing would all come in together nearly as a priority is that they are getting protected time” (FG4 P3)

It was acknowledged by the participants that progress was being made in this regard in relation to newer roles such as Community Paramedic.

“There is a change with that now though, part of our strategy for the Community Paramedic and Critical Care Paramedic, there is 20% research time being built in” (FG3 P4)

2.2 System facilitators

Collaboration

Co-operative working

Participants highlighted the importance of collaboration between diverse stakeholders co-operating across settings and services in the uniquely complex out-of-hospital environment.

“But also you’ve got government, you’ve got public health, research funders, you’ve got the universities and loads of other ones that I’m not even thinking about, I guess all of those may have some relevance” (FG5 P3)

“I think there’s a really big opportunity to come out of like, we all have different silos that we’re working in... So I think there’s a huge space to actually link all those, in a collaborative way” (FG5 P2)

Specific examples of how co-operative working can facilitate research in the field going forward were discussed, from the significance of informal networks to more formal collaborative working structures.

“Information dissemination about how to create a research group, how to create a network, how to do all of these things, people who have gone before us because they are out there, and they will happily share their expertise” (FG5 P1)

“All the hospital groups have MOU’s with universities as they go. And that lifted a lot of barriers around GDPR and all of the repetitive paperwork for individual projects, that MOU structure is very useful” (FG4 P1)

Knowledge translation

Collaboration was considered crucial for knowledge translation in paramedicine. It was viewed as a means to demonstrate the value of research, update practice, to improve patient outcomes and to share research findings between stakeholders. Participants felt that highlighting the evidence base for the Clinical Practice Guidelines (CPG) could be a good starting point for engaging paramedics in research and encouraging collaboration with policymakers.

“Maybe part of the solution is as a culture, if you can show that the benefit of research. Like you said early on, some practitioners brought some CPGs forward and I know because I have, but it’s not really advertised... This is what research does it changes your practice” (FG4 P2)

“We have to be clearer about our how our CPG development process works and how you can access it as a practitioner, and how your best chance of changing something is to have a strong evidence base” (FG4 P5)

The participants in the focus groups (which included patient representatives) also emphasised the importance of measuring patient outcomes and collaborating with service users to deliver patient-centred research.

“So I think one of the things when I was looking at this, that I thought was missing, was the patient. You know patient outcomes, but patient outcomes is not patient satisfaction” (FG3 P5)

Educational facilitators

Higher education

The strong focus on education, particularly higher education in recent years was universally welcomed by participants.

“I think the fact that education and professionalism are linked together is key because we are professional bodies, it is our employment, the education has to match the profession and the level that we’re trying to give to patients” (FG1 P3)

The importance of higher education in terms of building research capacity and developing a pipe-line of researchers in the discipline was also acknowledged.

“So currently, there are 5 PhD students... so we’re developing a cohort that will eventually get out the other side that will have PhDs that will be able to supervise their students research” (FG1 P5)

“I think the mindset of new paramedics coming out with degrees and they’re more academically focused. It’s 21 years since I joined the service, it was all handwritten, nothing online. Now, you see the recruits coming in and they’re at the table with the laptop doing jot forms. They’ve a better understanding of the importance of research on how to contribute towards it and I feel these are enthusiastic about it” (FG4 P6)

Dissemination

Participants considered the dissemination of research to be important on multiple levels particularly in terms of education and knowledge sharing, in preventing duplication of work in a resource-limited environment and regarding the professionalisation of paramedicine.

“Spread that knowledge throughout your circle... but also the people from the ground are given the opportunities to learn and to be accountable, it works two ways” (FG2 P1)

“There are loads of thesis, dissertations but nothing happens with them. So what are we doing? Instead of sitting in a library somewhere, could people not come forward and say here’s something? Or should we have a group that looks at those and say there’s a good bit of research, we should actually get that published” (FG1 P5)

“To develop and become a profession, you must have published information. You cannot get published information if you don’t do the work, do the research” (FG3 P4)

Professional facilitators

Autonomy & policy

Participants highlighted that paramedic skills and decision-making ability were not aligned with current practice and

autonomy could be developed with stronger legislation in order to facilitate future research.

“I think our people have the skills to be able to differentiate between what needs an ED as opposed to a Medical Assessment Unit as opposed to a Local Injury Unit. I think we should be open to at least that part of treatment referral” (FG1 P2)

“I think the push should be for the legislation. I’m not at all criticising. We should be pushing. I mean, you see that’s education and professionalism. As a profession, we should be able to stand like medicine or any other profession that is allowed to work (autonomously)” (FG1 P5)

It was felt that certain policy changes could be adapted by the regulator to further develop the profession, such as protected time for research and the introduction of portfolios for Continuing Professional Competency (CPC) and Continuing Professional Development (CPD) across all responder and practitioner levels.

“Everything is driven by policies and governance. And if the regulator slipped in something saying... the ability to allow once a year, some sort of research, now protected time” (FG6 P4)

“If you want to do any review as part of your portfolio, there’s no need. There’s no requirement to do so there’s no requirements. There is a gap there, again in the development of the profession” (FG1 P5)

A professional voice

The absence of a unified professional voice for the paramedic community in Ireland was highlighted and it was felt by participants that this would be a strong facilitator for research.

“I think one thing that is absent from the system is a really strong professional voice. Appreciate that, we’re talking about all levels of responder and practitioner, but what we don’t have is the same paramedicine representative body that represents the professional, that will be a feature of all other settings in Ireland... that professional voice, will recognize that research is important, and will trying to leverage their position to advance research along with education” (FG5 P3)

Research infrastructure

The importance of a strong research infrastructure in paramedicine was widely recognised and participants agreed that progress was being made in developing this infrastructure in Ireland.

“Do we have the infrastructure to achieve research in pre-hospital emergency care, traffic, or significant research or impactful research? You know, that’s a question that’s hard to answer. And certainly, it’s early in the stage of development of that I would say” (FG5 P3)

Participants highlighted that research needed to be promoted more and particularly that research should be accessible to all practitioners in the field. In a busy clinical environment, the

“carrot” approach to driving research forward was considered optimal.

“Here’s a point towards your CPD for the year which they have to complete. I don’t know how many points but they need those points. So you get them a little bit of a carrot and incentive to do it” (FG2 P8)

Generally, the participants felt that the building blocks had been laid to ensure a strong foundation of a research infrastructure and expressed positivity about the future for paramedicine research.

“I don’t think we’re going to be reinventing the wheel, I think there’s a lot of really good things going on” (FG5 P6)

Research leadership

Research leadership was seen as being critical for the development of a strong research infrastructure. The importance of paramedic-led research was also considered fundamental to the development of research in the field.

“You really need that sort of senior research leadership involvement. I think that’s maybe one of the challenges because there isn’t really a national institute for pre-hospital care research. There’s no national organization, there’s IPERN, which I think is a great grassroots movement, what you need to have that linked with a critical mass of research infrastructure and leadership, to actually get the big projects going” (FG5 P3)

“If it’s paramedicine research we are doing it should be paramedicine (led). You know, I’m not disrespecting any profession. We have no research comparatively speaking to nursing or medicine or any other healthcare profession. So it should be driven by the profession” (FG1 P5)

The need for specific research roles in paramedicine was highlighted by participants, in addition to the concept of “research champions” to promote engagement at all levels within services.

“So the services could be encouraged to have 50/50 positions, whether that’s for research or for tutors to be with universities, so that they develop that research agenda” (FG1 P5)

“It may be well placed champions of the research portion, you know, strategically well placed. I know the organization I work for you have divisional level, you have district level, you have champions at those levels that are going to try and drive it forward and promote people to have a look at it and engage” (FG2 P3)

Research support

Participants agreed on the importance of dedicated support services to facilitate paramedicine research at all levels, but particularly for early-stage research.

“We’re lucky enough to have research support within the service, but that’s only this year” (FG5 P2)

“An open access structure where it’s not a service-related structure, it’s, you know, it’s a research service” (FG6 P4)

“I think what’s core to the success of this is a central hub... if you want to do research in Ireland, here’s a place to go. And from here, we will signpost you to the right direction via areas of interests, linking in with people with certain areas of practice, or you want to do a bit of research that involves this type of data, well, you have to do this or you have to do that. So really clear, concise information for the front end user of how to actually start doing early stage research” (FG5 P4)

The significance of mentorship in research was highlighted and the need for a more structured approach to mentorship was identified. Participants were conscious of continually drawing from the same ‘well’ of more experienced researchers. Peer-support was also considered to be important for research.

“Have a pool of open access, support, either supervisors or researchers... because that would make a huge difference to our guys that will probably be researching away today if they had access to people, as opposed to time-banding somebody who you already know is busy with their own job” (FG6 P4)

“So you have the clinical years of experience. They have some skills, you know, so work together. And you could guide them in terms of your research questions, what they should be looking at what you think is important after years of experience, and they might be able to do the Excel sheet or whatever, so it’s about that joined up thinking, mentorship, coming together to enact on research ideas” (FG1 P1)

Research funding

Funding is a vital element of research infrastructure both for building research capacity and culture. Participants emphasised that scholarships and project-specific funding would be beneficial and the potential for organisations to combine financial resources to maximise impact was discussed.

“The other thing you could do is try and incentivise it. And, you know, if there was a scholarship, or if there was an award for each class” (FG1 P5)

“I think we need to develop a more collaborative pool of resources into how we’re going to fund those projects. Because inevitably finances are needed to do any research” (FG5 P6)

It was felt that funding research positions in paramedicine would have a significant ripple effect and would provide good value for money in the longer term across services.

“I think it will be achievable with a modest but significant funding perspective... And I think initially, some of the expertise,

the methodology expert would probably have to come from outside of paramedicine or some of the content expertise as well as making decisions about the process. And I think the spin offs... access to methodology, access to research leadership...So I think that will be something tangible that could work” (FG5 P3)

Research data

Participants observed that in recent years there had been a culture change in relation to the use of data for research, which had emerged because of practitioners contributing to the national out-of-hospital cardiac arrest register (OHCAR). The use of registry data was considered “*low hanging fruit*” which could be utilised to a greater extent by researchers.

“Now everyone is sending their information to the cardiac arrest Data Centre... we’re nearly at 80% compliancy. With that it’s now become a cultural thing to send it, whereas previous to that it was why would I send it? And I suppose it’s a natural adjustment as well, from practitioners within the service to say, you know, the only way we can progress is on evidence-based data” (FG2 P4)

“A huge part of it is getting data, but there are resources like registries, like TARN, you know, the trauma registry is there. I think there’s the hip fracture registry, and there’s probably a lot more resources that researchers can access already, that are kind of this low hanging fruit, possibly to start making people aware of that” (FG2 P5)

While challenges around the use of electronic patient care reports (ePCR) were noted, participants also appreciated the unique potential of this research data to inform decision-making nationally by the ambulance services.

“We have never had such an infrastructure around data and data availability, I think the electronic patient care records, obviously, there’s so many issues to consider, but actually having an electronic system, that is a huge opportunity I think for data-driven decision making. Actually the National Ambulance Service is one of the only areas in the Irish health service that has a national electronic patient record” (FG5 P3)

Research strategy

The development of a new national research strategy for paramedicine was collectively embraced by participants. It was also noted that to identify research topics, targeting projects in line with the priority themes of the strategy would be helpful for researchers.

“I think it’s very welcome. It puts the structure on what is required, it shows paramedicine research is very, very new. A lot of people have done bits and pieces, but I think it hasn’t been coagulated yet. So that’s great. It allows us to see what other people need, and their views” (FG4 P2)

“When you’re trying to decide what you want to research, it can sometimes be hard to find something to research, at least with the themes now, if they’re made available, I think people will go down that road, and look at those different areas” (FG4 P3)

Participants discussed how the research strategy would be most effective if linked with wider Health Service Executive (HSE) structures and queried responsibility and roles for actioning the strategy. Participants agreed that an implementation plan would be required to maximise the effectiveness of the research strategy.

“From the point of this research strategy, to make that effective, you probably need to link in with the rest of the HSE internal research on a research level as well as a clinical level and a strategic level, a resource level” (FG3 P2)

“But there’s no point doing a strategy if we don’t have an implementation plan” (FG4 P3)

Discussion

The findings of this study have demonstrated that barriers and facilitators to the implementation of a national research strategy exist at individual and system levels. The overarching themes developed from the focus groups included; Challenges in the Research Landscape and Opportunities to Build a Research Ecosystem. The need to build research capacity in Irish paramedicine has previously been highlighted²². However, this is the first Irish study to qualitatively explore the paramedicine research environment in collaboration with diverse stakeholders to inform the development of a national research strategy. The barriers and facilitators to research in paramedicine identified in this study are in line with those previously reported internationally²³⁻²⁶.

The first theme developed in this study was “**Challenges in the Research Landscape**” which described individual and system barriers which will impact on the implementation of the national research strategy in paramedicine. Individual barriers included **Experience and Skills, Time and Wellbeing**. At system level, **Operational, Educational, and Professional** barriers were identified in addition to the fact that the **Research Infrastructure** in paramedicine remains undeveloped in relation to limitations in **Research Leadership, Support, Funding and Data Access**. An inter-play between both individual and system barriers was observed which makes incorporating research into clinical practice even more challenging for paramedics. For example, **Wellbeing** was an individual barrier to research participation, but this was strongly impacted by operational system barriers such as **Service Capacity and Staffing Issues**.

The second theme resulting from the focus groups was “**Opportunities to Build a Research Ecosystem**” which identified individual and system facilitators to the research strategy implementation. Individual facilitators included; **Professional Identity, Evolving Roles and Protected Time**. At system level, **Collaboration, Educational Facilitators and Professional** facilitators were identified combined with a strong **Research Infrastructure** and guided by a **Research Strategy**.

Referring to **Experience and Skills** as an individual barrier, the traditional model of vocational training in paramedicine had a limited research focus²⁷, meaning that paramedics had little opportunity to develop these skills. Similarly, a lack of training in research skills was reported as a barrier to research

for paramedics in other studies^{24,26}. However, the lack of confidence, to the point of fear, relating to research among paramedics in this study was striking, with one participant describing themselves as being “terrified” at the prospect of it. Therefore, it’s essential that **Research Support** and education on research must dispel these fears around undertaking research and focus both on imbuing skills and instilling confidence in practitioners, particularly related to academic writing and digital skills, which were perceived to be most challenging by participants. **Higher Education** is an important research facilitator, but as a core element of **Research Infrastructure**, skills training and **Research Support** should be accessible to all frontline paramedics and not limited to those who are enrolled on academic courses. With respect to **Educational Barriers** at system level there were discussions within some groups about the potential to distance the role of the Statutory Regulator in this process to support a more independent and rigorous **Assessment** model.

Paramedics are a mobile workforce who respond to an undifferentiated caseload in a variety of settings and locations¹ which can impact strongly on stress levels and work-life balance. In terms of **Wellbeing** as an individual barrier, the unpredictable nature of the paramedic role is unique in the health services due to the uncertainty of finishing times and locations post-shift. Participants highlighted the negative impact these variable and long working hours have on family life, reporting that these pressures can contribute to the breakdown of relationships. The nature of shiftwork also brings challenges with diet and sleep hygiene, also contributing to poor health outcomes for paramedics²⁸.

For paramedics who are research-active this was described as a “Moral Hazard” in some cases because the associated guilt of being absent from the frontline meant they took on additional clinical work to compensate for their research time, contributing further to poor **Wellbeing** and even burnout. Consequently, research projects undertaken by paramedics are frequently left unfinished or unpublished. This is a further example of the complex connections between the barriers and facilitators to paramedicine research at individual and system levels, as **Dissemination** is considered an important **Educational Facilitator**.

The acute hospital system in Ireland is under severe pressure and ED crowding is now a significant public health issue²⁹. Referring to operational barriers the role of paramedics is frequently impacted by the knock-on effect of broader health system challenges, including high rates of ED presentations and hospital bed capacity, leading to ambulance offload delays. These challenges were described by participants in this study as contributing factors to burnout in paramedics. This gives a sense of the difficulties in navigating this landscape with the fluid and often volatile nature of the paramedic role which is heavily dependent on capacity issues within acute health **Service Capacity**.

Lack of Upskilling Time was identified at system level as an Educational Barrier to research and conversely **Protected Time** was universally recognised by participants as an individual

facilitator for research. Time was also articulated as a key theme in a study spanning the UK and the US on paramedic perspectives on involvement in out-of-hospital research²³.

Paramedic **Scope of Practice** in Ireland was considered a Professional Barrier identified in this study. Internationally in most jurisdictions, paramedics practice autonomously on their own licence and have the capacity to make disposition decisions in their own right. However, in Ireland, “treat and refer” only applies in limited circumstances, so if an emergency ambulance is called then in most cases the paramedics must provide transport to an ED, unless the patient explicitly refuses to travel. Although it did not arise in the focus groups, it should be noted that exemptions were made during the COVID-19 pandemic whereby paramedics could decide not to convey patients with suspected or confirmed COVID-19 deemed not sick enough to need hospital treatment, based on an algorithmic scoring system. However, in general **Scope of Practice** limitations were considered a source of frustration for Irish paramedics who reported that it was also perceived as being a contributing factor to ED crowding by hospital colleagues which could be a source of friction.

In terms of Professional Barriers and the development of a **Research Culture** in paramedicine it was suggested by participants that the belief persists that research is solely the preserve of academics in ‘ivory towers’, which unfortunately deters frontline clinicians from engaging in research. Additionally, participants highlighted cultural issues in terms of a perceived lack of value of research among service providers resulting in limited organisational buy-in and a lack of opportunities for paramedics to participate in research. A lack of organisational priority for research was also considered to be a barrier in the PARAMEDIC trial of human factors in prehospital research²⁵. A recent systematic review also concluded that the introduction of research to the role of paramedics is generally poorly supported at an organisational level²⁶.

Other barriers identified in this study related to an undeveloped **Research Infrastructure** and issues with limited **Research Leadership** and particularly in relation to paramedic-led research. Additional barriers were identified around limited **Data Access** and **Funding** for research. These barriers to paramedic research are not unique to the Irish setting and have also been described in other jurisdictions^{30,31}.

The National Prehospital Research Strategy published in 2008 identified barriers to research at the time including; access to reliable, standardised dispatch, clinical and operational data, lack of opportunities to develop research skills, insufficient funding, resource allocation issues around time for research and that a research culture had not developed in prehospital care⁷. The solutions to these impediments were also identified and included; introduction of national computer aided dispatch, use of electronic standardised patient care, development of a national policy to allow practitioners to access hospital records, targeting private companies for funding in addition to ring-fencing funding and facilitation of protected time to conduct research⁷. In the interim, significant progress has been made in terms of data access which is extremely

positive. Reliable, standardised dispatch, clinical and operational data is now being collected by NAS following the reconfiguration of regional control centres to a National Emergency Operations Centre (NEOC)³² and the transition from paper-based records to an electronic patient care report (ePCR)³³. However, since the publication of that seminal document, limited progress has been made regarding the other barriers described, almost 16 years later.

This study has identified several facilitators to the implementation of the new National Research Strategy under the theme of Opportunities to Build a Research Eco-system. In relation to **Professional Identity** which is an individual facilitator, the value of the paramedic role in the Irish health system was clearly recognised by stakeholders from other healthcare professions in the Focus Groups. It was acknowledged that paramedics have a unique skillset in treating undifferentiated patients in the unpredictable out-of-hospital environment. Ambulance services act as the safety net for the wider health service³⁴ paramedics are also frequently the first access point to the health service, frequently playing a role in inclusion health. It was also highlighted that paramedics have the opportunity to see patients in their own environment while on scene and spend dedicated one-on-one time with patients providing personalised care during transport to hospital. Ambulance Services have the distinctive position of sitting at the intersection of health care, public safety, and public health³⁵, and while an integral part of health systems, are also often perceived as being a separate entity. However, it was noted by participants in the study that ambulance services were becoming more integrated with the wider health service in recent years which was primarily driven by increased **Collaboration** during the COVID-19 pandemic, but is also positive in terms of offering further opportunities for research and **Knowledge Translation**.

In terms of **Collaboration** as a System Facilitator participants highlighted the need to abandon working in silos and particularly felt that **Co-operative Working** with universities to develop academic-clinical partnerships or hybrid roles would be important to drive forward paramedic-led research in the future and to enable **Knowledge Translation**

Recent years have seen **Evolving Roles**, such as Community Paramedics¹⁷ and ACPs such as Pathfinder¹⁸ being introduced in the NAS. This aligns with current national health policy (Sláintecare) on shifting care from the acute setting into the community³⁶. It is often perceived by the public that delayed ambulance response times and ED crowding are due to inefficiencies in these services; however, participants noted that this was due to pressure in the wider health system generally. The participants considered the addition of new roles and ACP to be extremely positive and expressed hope for the development of advanced practice roles in the future, similar to those in the nursing profession.

In terms of Educational Facilitators the relatively recent transition to **Higher Education** for paramedics in Ireland³⁷ was widely welcomed by the participants in this study. The academic skillset was particularly seen as a positive in relation to the development of research in paramedicine. However,

traditionally entrants to the profession tended to be older and in some cases, paramedicine was a second career so the participants expressed concerns about the lack of life experience and coping skills in young university graduates. Another concern linked to Educational Barriers related to an imbalance between the educational focus of paramedics and the nature of calls received. Traditionally paramedicine has been solely associated with emergency care; however, in reality life-threatening emergencies comprise a small fraction of the ambulance service workload³⁴. Also, in relation to Educational Facilitators the need for the development of a research pipe-line and capacity building at PhD level to enable more **Research Leadership** and particularly paramedic-led research was highlighted. **Dissemination** and academic publications were also seen as crucial for research development.

Regarding **Professional Facilitators**, the participants emphasised the need for updated legislation in relation to Autonomy and standardisation of portfolio requirement across levels for CPC and CPD. Discussions in the groups also centred around the lack of a professional body in Ireland which would advocate for paramedics, with comparisons being drawn to the College of Paramedics in the UK which is currently working towards recognition as Royal College status³⁸.

During conversations around **Research Infrastructure** different approaches to encouraging participation in research were discussed with participants agreeing that an incentive “carrot” approach would yield the best chance of success. This agrees with Leonard et al who also suggest positive reinforcing factors are the optimal approach to incentivise participation in research by paramedics²⁴. In terms of other facilitators, the participants talked about new protocols for **Data Access**, the provision of a new **Research Support** service in NAS and the sense of stronger **Research Leadership** in recent years as positive developments which will facilitate the implementation of the new National **Research Strategy** for paramedicine.

In specific conversations about the **Research Strategy** participants universally welcomed its publication as a positive step forward for research in Irish paramedicine. It was felt that the strategy would be most effective aligning with national policy such as Sláintecare. Queries were raised about ring-fenced funding and regarding roles and responsibilities in terms of actioning the strategy, with the consensus being that an Implementation Plan would be required to ensure optimal outcomes for patients, paramedics, services, and the public.

Implications of findings

In a challenging research landscape, all stakeholders have a role to play in overcoming individual and system level barriers to ensure cultivation of a flourishing research eco-system and allow for effective implementation of the national research strategy. Alignment with national health policy, such as Sláintecare, is essential and policy makers in the field must ensure that legislation, procedures, and guidelines relating to CPC and CPD facilitate paramedic autonomy while ensuring adequate protections are in place for patients. Service Providers should support organisational structures that build research capacity and encourage research culture in the workplace so that research becomes normalised and embedded in daily

practice, which may include the need for protected research time across roles.

Educators must deliver specific education and training to overcome barriers related to research skills. Higher education institutions should work to make research more accessible and communicate research in a manner that can be easily understood, while also fostering involvement in research projects. Consideration may be given to the foundation of a central academic-clinical research hub or an “incubator” platform for supporting research nationally. Research support, mentorship and leadership must be fostered with the development of a paramedic-led research pipeline.

While it is not expected that every practitioner is a researcher, all paramedics should have a basic understanding of research and work to support evidence-based practice in the paramedic community. Multi-disciplinary input across services and clinical settings is necessary, particularly given the complex nature of care delivery in the out-of-hospital environment. Public and patient engagement is important to ensure person-centred research with optimal health outcomes in the future. Collaboration will be essential across stakeholders to enact the research strategy and an implementation plan with ring-fenced funding, and clearly delineated roles and responsibilities will be required to ensure the success of the research strategy. Future work should explore the implementation of the national research strategy in paramedicine. Additional work should focus on exploring patient and public perspectives on care in the out-of-hospital setting.

Limitations

This research has limited PPI, although attempts were made to recruit patient representatives in the study, participation was limited. Every effort was made towards inclusive recruitment but it is possible that the research is biased towards those with an interest in research. The use of focus groups may have introduced a bias and subsequent limitation as the discussions may have been impacted by the perceived social desirability of the answers and contributions made by each participant. Regarding sex and gender, female participation in the study was low, but representative as per registration data in a discipline that is primarily male dominated. The analysis was completed by female researchers, however, each of these work in research environments and subsequently this may have introduced a bias and subsequent limitation in terms of what was deemed relevant to the research question.

Conclusions

The research landscape in Irish paramedicine is challenging and stakeholder collaboration will be essential in overcoming individual and system level barriers to ensure cultivation of a research eco-system and effective implementation of the national research strategy. An implementation plan will be required to ensure the research strategy is both actionable and effective so that the knowledge generated translates into policy and practice with meaningful impacts for services, patients and the public.

List of abbreviations

ACP = Alternative Care Pathway

AP = Advanced Paramedic

COREQ = Consolidated Criteria for Reporting Qualitative Research

CPC = Continuing Professional Competency

CPD = Continuing Professional Development

ED = Emergency Department

EMS = Emergency Medical Services

EMT = Emergency Medical Technician

HSE = Health Service Executive

NAS = National Ambulance Service

PHECC = Pre-Hospital Emergency Care Council

SP = Specialist Paramedic

Declarations

Ethics and consent

The study was performed in accordance with the Declaration of Helsinki ethical principles for medical research involving human subjects¹⁴. Ethical approval was obtained on 14th December 2022 from the Education and Health Sciences Research Ethics Committee at the University of Limerick (Ref. 2022_07_01). Written, informed consent was obtained from all participants prior to enrolment in the study and was repeated at the start of the Focus Groups to ensure participants remained well informed of the risks and benefits of participation and made aware of the option to leave the study.

Data availability

Underlying data

Data access is restricted for ethical reasons. The aim of our study was to explore the barriers and facilitators to the implementation of a national research strategy for paramedicine. During the Focus Groups it was likely that participants would share information regarding their experiences with patients and with service providers, therefore we felt it would not be appropriate to share the raw data (audio recordings and transcripts) collected for this study and we did not obtain ethical consent to do so. If readers would like to ask questions about the data they can contact Dr. Niamh Cummins who can provide further information and a detailed overview of the analysis. Select quotes may be made available on reasonable request from the corresponding author: niamh.cummins@ul.ie

Extended data

Open Science Framework: Barriers and Facilitators to the Implementation of a National Research Strategy for Paramedicine in Ireland <https://doi.org/10.17605/OSF.IO/U7NMD>³⁹

This study contains the following extended data:

- Information Sheet

- Consent Form
- Focus Group Question Guide
- COREQ Checklist

Data are available under the terms of <https://creativecommons.org/licenses/by/4.0/legalcode>. (CC-BY 4.0)

Reporting guidelines

OSF: COREQ checklist for ‘Barriers and Facilitators to the Implementation of a National Research Strategy for Paramedicine in Ireland’. <https://doi.org/10.17605/OSF.IO/U7NMD>³⁹

Data are available under the terms of <https://creativecommons.org/licenses/by/4.0/legalcode>. (CC-BY 4.0)

Authors’ contributions

NMC, AMB, JW and KAB conceived and designed the study. CF and NMC drafted the semi-structured interview questions and AMB, A-MB, BD, CF, MOT and NMC facilitated the focus groups. UC and NMC reviewed the transcripts and verified the data. CF, UMC and NMC conducted the data analysis and NMC and CF drafted the manuscript. All authors reviewed the manuscript, contributed with amendments and approved the final version.

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