



## Specialist ambulance nurses' experiences of births before arrival

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### ABSTRACT

**Background:** Working as an ambulance nurse means interacting with and caring for acutely ill and injured patients. It can even involve births before arrival to the hospital (BBA), which are rare but increasing due to the centralization of maternity wards.

**Aim:** This study describes the experiences of specialist ambulance nurses with BBA.

**Method:** A qualitative study was conducted, and nine specialist ambulance nurses who had assisted with one or more prehospital births were interviewed. Data were analysed with thematic content analysis.

**Findings:** The analysis revealed three categories that were compiled into a theme of feeling fright and exhilaration. The findings showed that BBA causes feelings of anxiety and stress. The experience is also associated with joy and relief when the baby is born. Childbirth is a situation for which specialist ambulance nurses feel less prepared, lack of knowledge, and wish for more education.

**Conclusion:** Specialist ambulance nurses face challenges in the pre-hospital care environment during BBA, with long distances, a lack of equipment aboard the ambulance, and no assistance from midwives. To feel secure in the complex role that is required when assisting with a BBA, specialist ambulance nurses should be given the opportunity to receive scenario training.

### 1. Background

Working as specialist ambulance nurse means meeting patients of different ages with all kinds of acute illnesses or traumas. The environment is one that differs radically from case to case, which can be a challenge to cope with [1,2]. The work can include assisting with births before arrival (BBA) to the hospital. This situation can be demanding and has shown to be especially stressful as it means that the specialist ambulance nurses are expected to handle BBA by themselves [3]. It can be challenging to assist with a delivery, even though most births are uneventful, BBAs are high risk clinical challenges [3,4]. Due to this combination of infrequency and urgency, we explored specialist ambulance nurses' experiences with this kind of emergency and whether they consider themselves as being prepared for the task.

From a global perspective, BBA occurs most often at home. However, they are rare in developed countries [5], and just a small number of these cases involve deliveries in an ambulance [6]. Most of the women who deliver before arrival to hospital are delivering their second or third child and experience a shorter duration of labour [7]. In Sweden, the rest of Europe, and Australia, the number of maternity units has decreased due to the centralization of maternity units. The

result has been an increase in the number of BBA, especially among women living in remote areas [5,6,8–10]. However, studies have shown that women who live close to birth clinics can also have an increased risk of BBA [7]. This can be explained by the fact that women stay at home for a longer time or are advised by midwives that they can wait at home until labour begins.

BBA increases the risk of complications such as blood loss and the need for transfusion. The new-born child is at risk of hypothermia, which can be prevented by skin-to-skin contact with the mother immediately after the delivery [7]. McLelland et al. have shown that maternal and neonatal outcomes are much poorer after unplanned BBA than after planned home births or hospital births [10]. To avoid such risks to both the mother and the baby, it is important that specialist ambulance nurses have knowledge about BBA. When these births are unavoidable, the nurses have to create a safe and calm environment and support the mother in the delivery process [2,6]. Specialist ambulance nurses have to be prepared for many unexpected circumstances such as BBA [11]. To increase knowledge in this area, the aim of this study is to describe specialist ambulance nurses' experiences with BBA.

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## 2. Method

### 2.1. Design

This study was conducted with a qualitative approach as the aim was to describe specialist ambulance nurses experiences. Data was collected with semi-structured individual interviews to reflect individual experiences [12,13]. Data were analysed using content analysis [14].

### 2.2. Context

Two ambulance stations in Sweden were selected for the recruitment of participants in the study. These stations are rather far from hospitals (mean = 80 km). Ambulance services in Sweden have staff with different levels of education, including specialist ambulance nurses, registered nurses, and emergency medical technicians. All ambulances must have at least one registered nurse according to legislation. Staff with the highest medical competence, has the main responsibility for the treatment of the patient.

### 2.3. Participants

The participants in this study were included if they were educated in special ambulance nursing (at least one year of university education at a masters or advanced level). All participants had also been active in ambulance care for at least two years and had assisted in one or more BBA. Both women and men were included. Specialist ambulance nurses who were willing to participate in the study contacted the authors by either mail or telephone. Eleven ambulance nurses showed interest in participating. Two of them were excluded because they did not have specialist training in ambulance care. Nine specialist ambulance nurses met the inclusion criteria and participated in the study. Six were men and three were women with age between 36 and 60 years, an average of 14 years of nursing experience, and 9 years of experience in ambulance care. On average, they had assisted in three or four cases of BBA (Table 1).

### 2.4. Data collection

Prior to the interviews, the participants were re-informed about the aim of the study and told that their participation was voluntary and confidential, that the interviews would be recorded, and that they could withdraw their participation at any time. Data were collected through qualitative, individual interviews with the nine specialist ambulance nurses. Data collection took place during March to April 2016. The interviews were semi-structural and involved an interview guide with open-ended questions (Table 2). Most of the participants chose to be interviewed at an office in the ambulance station. The interviewers ensured that the location for the interviews would be a separate space where the participants could speak undisturbed and without anyone else being able to hear what was said. The interviews were recorded

**Table 1**  
Description of participants.

	Number	Average (spread)	Median
Participants	9		
Women	3		
Male	6		
Age (year)		43 (36–60)	42
Experience as a nurse (year)		14 (9–23)	12
Experience in ambulance care (year)		9 (2–15)	10
Experience as an ambulance nurse (year)		8 (0,5–11)	8
Number of assisted pre-hospital childbirths		4 (1–15)	3

**Table 2**

Interview guide.

Please describe your feeling when you received a call for a potential pre-hospital delivery.
Please describe your thoughts and feelings on meeting the patient.
How did you act and what actions did you perform during childbirth?
Please describe the thoughts and feelings you had during childbirth.
How did you experience the follow-up when the baby was born and during the continued transport to the obstetrics department?
How did you experience the possibility of being a support for the relatives?
How did you experience the delivery of the mother and child to the obstetrics department?
How did you experience your personal degree of preparation (action preparedness) for an emergency of this nature?
Did you find that your education and knowledge were sufficient to be responsible for and assist in a pre-hospital delivery?
Is there anything else you want to add?

using a mobile phone and later transcribed verbatim by two of the authors (A.-C.P; O. B).

### 2.5. Data analysis

Data were analysed using content analysis [14]. An inductive approach was used, which means that the authors avoided using pre-determined categories [12], and instead, the theme and categories were analysed based on the text. In the analysis, the authors endeavoured to obtain both the manifest, objective content of the text as well as the latent content, which refers to the underlying themes of the text.

The text was read several times by the authors to gain an idea of the content. Meaning units considered relevant to the aim were extracted along with their context. The meaning units were condensed by shortening the text while preserving the essence of the text. The condensed units were given a code to label what the opinion-bearing device was about. The codes were compared and categorized in two steps to finally obtain three categories that highlighted the central content of the interviews. Based on the categories, one theme was identified to describe the underlying meaning in the categories [12,14].

### 2.6. Ethical considerations

Permission to perform the study was obtained by managers at the two ambulance stations before the study participants were recruited. After written approval to complete the study was obtained, the managers forwarded an e-mail with information letters containing the invitation to participate and the corresponding response to the ambulance nurses. The specialist ambulance nurses who offered to participate were given verbal and written information about the study and signed a written request for informed consent. The participants were guaranteed confidentiality in the presentation of the findings, which means they would remain anonymous in the study. The ethical principles conformed to the Declaration of Helsinki [15]. In Sweden, an ethical review is not necessary when all participants give written consent to participate and when the study does not involve a physical intervention affecting people.

## 3. Findings

Nine specialist ambulance nurses participated in the study, six were men and three women. The content analysis resulted in three categories that described the manifest content of the interviews: a desire to feel safe in an unfamiliar role, concern and insufficiency linked to great responsibility, and feelings of joy and relief when the child is born. These categories could be compiled into a theme that illuminated the latent content: feeling fright and exhilaration (Table 3). The categories are described in continuous text with illustrating quotes.

**Table 3**  
Overview of theme (n = 1) and categories (n = 3).

Theme	Category
Feeling fright and exhilaration	A desire to feel safe in an unfamiliar role Concern and insufficiency linked to great responsibility Feelings of joy and relief when the child is born

### 3.1. Feeling fright and exhilaration

The specialist ambulance nurses described their experiences of having a desire to feel safe in the unfamiliar role they faced in a BBA. This alarm gave rise to many emotions among the nurses, which can be understood as a mixture of fear and delight. Feelings of nervousness and stress were prominent, and their knowledge about the risk of birth complications was described as frightening. To suddenly have two patients – the mother and the new-born child – instead of one gave rise to feelings of concern and insufficiency. After delivery and gaining assurance that the child and mother felt well, the fear disappeared and was replaced by euphoria and a sense of relief.

### 3.2. A desire to feel safe in an unfamiliar role

The ambulance nurses struggled to live up to their role and maintain a professional impression by appearing calmer than they felt inside. They described that when they arrived at the scene of the pregnant woman, they became more focused and tried to keep calm. They examined the woman to gain an idea of how much time remained before delivery, checked vital parameters, prepared for possible bleeding, and made sure that the woman received nitrous oxide. Good and relevant information from the EMD service was described as being important for being prepared. In cases where they only received information about abdominal pain, they did not feel sufficiently prepared.

Confidence in their own ability was a factor that the nurses described as increasing their impression of safety. The specialist ambulance nurses described what it meant to find themselves in the situation, to do their best, and to solve problems even though they felt stressed. In those situations, they felt that they acted as midwives, that they really did something and it could feel good and exciting. However, they also expressed a wish for more education and training in childbirth. During their specialist education, pre-hospital births were in limited focus, and during their daily work, they did not practice responding to these emergencies regularly.

During BBA, specialist ambulance nurses described themselves as being focused on delivering a healthy, living child and preferred that the baby scream right away after delivery since it is a sign of health. They checked the baby's breathing and circulation and made an assessment. They also described feelings of uncertainty and a bit of frustration in caring for the new-born child. As babies are small and slippery, the nurses did not experience having full control of the baby. Nevertheless, they found that they were able to accomplish the important checks, although it was not always done as methodically as they wanted. Because the ambulances lack security restraints for a baby, the specialist ambulance nurses described feelings of insecurity in case of a vehicle crash. This was described as being extra difficult when the mother was unable to hold her arms around the baby because of complications.

When the specialist ambulance nurses had left the mother and the new-born child at the maternity ward, they experienced an abrupt end when other staff suddenly took over. They mentioned that they had wanted confirmation that they were doing the right thing and that they managed to live up to their role. They had a need to reflect with a colleague afterwards, to sum up, and 'come down to earth.' In some cases, they chose to call back to the maternity ward to obtain feedback,

find out if they should have done something different, and hear if the mother and child were healthy.

*[The handoff] is very abrupt for the ambulance staff, which is quite reasonable as well since there are other staff who take over, and we should not stay and hang around the room.*

### 3.3. Concern and insufficiency linked to great responsibility

In cases of BBA, the specialist ambulance nurses described a sense of nervousness and adrenalin flowing with an internal sense of chaos. This was because childbirth was considered as a special and rare event.

*The feeling you get when you get the alarm is just nervousness because the alarms are so rare.*

The environment around a delivery, with its smells, blood, and screams, contributed to the intensity of the stress. There was often a wish that the birth would not take place in the ambulance. The risk of complications contributed to a sense of helplessness and frustration. Examples of anxiety were related to whether the mother would have major bleeding or whether the baby would be born with the umbilical cord around its throat. There was also a risk that the baby would not feel well after delivery or perhaps even be stillborn or born prematurely, which were all sources of concern. A particular moment that caused nervousness was the position of the placenta.

*I became frustrated and felt that this child would not feel good and wondered how should I handle that situation.*

The reason for the uncertainty about complications was ascribed to a lack of experience in such situations or that the nurses had previously participated in childbirths where complications occurred. By thinking through possible scenarios, the specialist ambulance nurses tried to cope with their concerns. For example, in case of complications, administering anti-inflammatory drugs or prioritizing rapid transport to hospitals were perceived as possible solutions.

*We felt that we should go there [the hospital] so as not to lose time if there were an issue [complications with the mother or/and the child]. You actually feel that the hospital is 240 km away.*

Another concern was having to be responsible for the lives of the mother and child. This meant increased responsibility – partly for the caretaker, but also for the driver who was operating the ambulance. Births were considered to be an emergency where focus is required, with a health care provider for each patient. Therefore, specialist ambulance nurses could not provide both patients with the nursing they needed. Due to the feeling of insufficiency, it was found to be beneficial to work with another nurse, whose skills could be used if there were two critically ill patients.

*In childbirth, it is a bit more – it is two lives you have to take care of at the same time if there is any complication.*

The worry about not having enough hands available in case of complications contributed to the feelings of isolation and vulnerability. It also contributed to the fact that they sometimes could not provide support for relatives since the focus must be on the child and the mother. Given the potential risks, some of the specialist ambulance nurses considered that the pre-hospital care did not offer good support for the relatives compared to everything that happening inside a maternity ward.

*It can be difficult to concentrate on a relative, the BBA, the mother, and the child. In those situations, your attention will probably be divided.*

The physical conditions with crowded care space in the vehicle meant that a relative could not attend the childbirth, or at least no more than sitting in the front seat of the ambulance. However, there was an endeavour to involve the relative more closely after childbirth.

### 3.4. Feelings of joy and relief when the child is born

The specialist ambulance nurses described the joy and euphoria that occurred in the moment after the child was born. Euphoria could arise for various reasons. Above all, euphoria occurred because the new-born child was healthy. Childbirth was perceived as a solemn event, and it was a special experience to attend and participate in. It was experienced as something very emotional. They described that they had expectations of being involved in something amazing, which is why they experienced BBA as fun, exciting, and challenging. If the childbirth did not occur during ambulance transport, they felt disappointed and would stay at the maternity ward waiting for the delivery.

*I became madly emotional, and when the delivery was completed, then I stayed and snuck around a little.*

However, a prerequisite for these joyful and emotional moments was that the childbirth had gone well and no complications had occurred. The specialist ambulance nurses experienced it as a cosy moment and a wonderful experience. In addition, a sense of relief and tranquillity occurred after the delivery when they found out that the mother and the new-born child felt well.

*It always feels a bit calmer when the baby is born. Then you calm down a little bit when you see that everything is ok.*

Even though there were positive experiences connected to the childbirth, the specialist ambulance nurses described the relief and warm feelings of leaving the patients to the midwives in the maternity ward, where the specialist ambulance nurses often experienced a well-prepared reception.

## 4. Discussion

The aim of this study was to describe the experiences of specialist ambulance nurses with BBA. The analysis resulted in a theme of a mix of fright and exhilaration, which included three categories (Table 3). The results showed that the emergency alert about on-going childbirth gave rise to a high degree of stress among specialist ambulance nurses because cases of BBA are rare. Relevant information from the EMD centre was described as important for being prepared for the assignment. Wireklint Sundström and Dahlberg [16] showed that information from the EMD centre beforehand is of great importance because it provides an initial guide of what the specialist ambulance nurses will encounter. However, they also showed that ambulance personnel should be open-minded regarding information from the EMD centre, especially when the alert is not about life-threatening situations. In this way, they can increase their ability to listen to the wishes of the pregnant patient and not make hasty conclusions.

The study results showed that confidence in one's own ability increased the feeling of security. Ahl and Nyström [17] showed that a safe and calm attitude by the nurse in a stressful and intense situation was described by patients in prehospital care as increasing their confidence in the caregivers and their respect for them. In relation to this, our findings can be understood as indicating that the nurses' strategy to keep themselves calm also imparts a calming feeling to the patient.

In order to be safe and not just feel secure, specialist ambulance nurses in this study requested more education about BBA. Despite being specialist nurses, they felt lacking in knowledge in this area, and only the experienced nurses expressed confidence. Gunnarsson and Warrén Stomberg [18] showed that education is a prerequisite for being able to make correct decisions during emergencies, and previous experience with similar situations is important. Nevertheless, specialist ambulance nurses lack the possibility of working with a trial-and-error method to find out what is the right decision. Nordén et al. [19] argued that education to become a specialist ambulance nurse should include more practical and theoretical training for rare incidents, such as BBA and ill children. After education, employers should give specialist ambulance

nurses the opportunity to increase their knowledge through hospital and scenario training.

Feelings of uncertainty and insecurity were prominent among the participants in this study. These feelings were related to the care and nursing of the new-born child, as well as the fact that ambulances lack sufficient security restraints for the child. Suserud et al. [20] showed that the working environment in the ambulance is not safe, especially when staff and patients are unbelted and the ambulance is driving at high speed. Also, Öberg et al. [21] showed that patient safety when transporting children can be complicated, and the lack of sufficient restraints for small children is a difficulty that could endanger the child's life in the event of an accident.

After arriving at the maternity ward to drop off the mother and the new-born child, the specialist ambulance nurses experienced a very abrupt handover. They wished for feedback regarding their management and to be reassured that they had lived up to their role. Jonsson and Segesten [22] showed that feedback after traumatic events during work are important for the ambulance personnel to understand whether they had acted correctly. Within the context of BBA, which might not be traumatic but can become so, it should be routine to give feedback to the specialist ambulance nurses. This would also be appropriate for increasing knowledge and confidence among the nurses so they will be able to handle similar situations in the future.

Specialist ambulance nurses try to create a calm and positive atmosphere, despite uncertainty about what will happen next [16]. In our study, the specialist ambulance nurses described that they tried to think through possible scenarios to be ready to cope with the situation, even though they had concerns about the outcome after delivery and had feelings of insufficiency. To switch between the known and the unknown is challenging for specialist ambulance nurses [16]. Bohström et al. [23] showed that specialist ambulance nurses feel stress related to the fear that they might not have enough resources to handle the situation. Childbirth incidents in particular give rise to feelings of not being in control. In our study, it became clear that a feeling of vulnerability was prominent. One reason for this feeling could be experiences of personal shortcomings.

The study results showed that specialist ambulance nurses experienced joy and exhilaration after the child was born. Being part of a delivery and seeing the healthy new-born child were described as an amazing experience. The opportunity to feel that one has done something good for the patient and their next of kin has been shown to increase inner strength and power among healthcare personnel [24]. Adriaenssens et al. [25] also showed that autonomy and job control increase motivation and engagement among staff. In the present study, it also became evident that specialist ambulance nurses experienced relief when leaving the mother and new-born child at the maternity ward. This is in line with results from Nordén et al. [19], where ambulance nurses described feelings of relief when handing over the child to the hospital, as they have more resources, are well prepared, and work in cross-professional teams.

## 5. Methodological considerations

While knowledge from this qualitative study cannot be generalized, it could be transferable to situations in similar contexts [13]. One limitation is the rather small number of participants. On the other hand, data collection was done in two different locations in the northern parts of Sweden. As this is quite a large part of Sweden, the study results might be representative of the situation in other parts of Sweden and other countries with similar pre-hospital contexts and organizations. As all authors have experience with pre-hospital care, we have tried to keep our preconceptions in check so as not to control the data during the analysis process [14]. That means that we asked questions about what might be obvious and follow up questions such as, 'please give an example', 'how did you feel', and 'what happened then?'. The interviews were conducted in Swedish and translated into English during the

analysis, which might have influenced the findings. However, the English language has been checked and revised by a professional editing company to ensure correct translation and grammar.

## 6. Conclusion

The experiences of specialist ambulance nurses with BBA can be described as a mixture of fear and delight with a desire to be safe in the uncommon role of assisting in pre-hospital births. The mission is characterized by a rush of emotions such as nervousness, stress, insufficiency, and concern for possible complications, but also emotions of euphoria, joy, and relief when the child is born. Specialist ambulance nurses want to exercise control over situations, but deliveries are an area where they feel less prepared and lack sufficient knowledge and experience. They face particular challenges in the pre-hospital care environment with long distances to travel to the ward, as well as a lack of equipment and no assistance from midwives. In this context, education and studies are needed for factors that may help specialist ambulance nurses to be prepared and feel safe in the complex role required during and after BBA. This could reduce the stress for the specialist ambulance nurses and help them to provide the safest and highest-quality care possible in the pre-hospital environment.

## 7. Conflicting interest

No conflict of interest has been declared by the authors.

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