JEMTAC
Journal of Emergency Medicine Trauma & Acute Care
A PEER REVIEWED JOURNAL

OPEN ACCESS

Research Paper

Patient-centric perspectives on non-conveyance decisions following pre-hospital emergency calls: A qualitative study

Hassan Farhat[1,2,3,*], Guillaume Alinier[1,4,5,6], Montaha Chakif[1], Reem Tluli[1], Fatma Babay EP Rekik[1], Ma Cleo Alcantara[1], Kawther El Aifa[1], Ahmed Makhlouf[1,7], Padarath Gangaram[8], Ian Howland[1], Mohamed Chaker Khenissi[1], Sailesh Chauhan[1], Cyrine Abid[9], Nicholas Castle[1], Loua Al-Shaikh[1], Moncef Khadhraoui[10], Imed Gargouri[11], James Laughton[1]

[1]Ambulance Service, Hamad Medical Corporation, Doha, Qatar
[2]Faculty of Sciences, University of Sfax, Sfax, Tunisia
[3]Faculty of Medicine "Ibn El Jazzar", University of Sousse, Sousse, Tunisia
[4]University of Hertfordshire, Hatfield, UK
[5]Weill Cornell Medicine-Qatar, Doha, Qatar
[6]Northumbria University, Newcastle upon Tyne, UK
[7]College of Engineering, Qatar University, Qatar
[8]Faculty of Health Sciences, Durban University of Technology, Durban, South Africa
[9]Laboratory of Screening Cellular and Molecular Process, Centre of Biotechnology of Sfax, University of Sfax, Sfax, Tunisia
[10]Higher Institute of Biotechnology, University of Sfax, Sfax, Tunisia
[11]Faculty of Medicine, University of Sfax, Sfax, Tunisia

*Email: Hfarhat1@hamad.qa

https://doi.org/10.5339/jemtac.2024.31

Submitted: 06 March 2024
Accepted: 12 August 2024
Published: 30 October 2024

ABSTRACT

Background: Patient-centered care is a foundation for high-quality healthcare delivery and is recognized by the Institute of Medicine as one of the six key elements of healthcare quality. It is fundamental to improving health outcomes, patient satisfaction, and overall healthcare system performance. In contemporary healthcare, we are encouraged to optimize our practices and deliver patient-centered care by actively seeking and analyzing patient feedback. This study explored patients' decision to refuse transportation to a medical facility after receiving on-scene pre-hospital emergency treatment.

Methods: A qualitative analysis approach was applied using semi-structured telephone interviews with 210 patients who had requested Hamad Medical Corporation Ambulance Service pre-hospital emergency care from June 15 to August 1, 2023 and decided not to proceed with hospital conveyance. A thematic analysis with inductive coding of the open-ended feedback was performed using Nvivo® software version 12.

Results: Data saturation was achieved with 32 responses. The thematic analysis revealed five critical themes: "*Rationales for using 999 emergency services*", which primarily focused on acute medical needs and the absence of alternative healthcare solutions; "*Reasons for declining hospital conveyance*", which included family obligations and previous unsatisfactory encounters at the hospital; "*Subsequent steps after declining hospital transportation*", which disclosed that most respondents remained at home after the intervention, while a minority sought further medical consultation through alternative means; "*Service satisfaction level*", which was predominantly positive; and "*Language barriers*", which highlighted specific challenges during the emergency call-taking process.

Conclusion: The study provided an understanding of the factors influencing patient decision-making in emergency medical contexts. It advocated targeted quality improvement interventions such as gender-responsive services and linguistic inclusivity. These findings highlighted the need for an integrative, patient-centered model that is attuned to the cultural and linguistic intricacies, thereby informing policy and practice to increase the efficacy of emergency medical services in Qatar.

Keywords: emergency medical services, patient-centered care, hospital conveyance, service satisfaction, language barriers

Cite this article as: Farhat H, Alinier G, Chakif M, Tluli R, Rekik FBEP, Alcantara MC et al.. Patient-centric perspectives on non-conveyance decisions following pre-hospital emergency calls: A qualitative study. *Journal of Emergency Medicine, Trauma & Acute Care.* 2024(7):31 https://doi.org/10.5339/jemtac.2024.31

QSCIENCE
HAMAD BIN KHALIFA UNIVERSITY PRESS

INTRODUCTION

Pre-hospital emergency medical services (EMS) are critical to a country's healthcare system, providing timely out-of-hospital medical interventions when most needed.[1] While EMS is designed for efficiency and efficacy, it faces challenges in managing patients who initiate emergency procedures but subsequently refuse hospital transportation. Such behavior raises medical, ethical, and legal issues, requiring an in-depth understanding of its effective management.[2]

Predominantly, pre-hospital care systems are designed to provide immediate delivery of on-site emergency medical treatment to expedite patient transfer to a medical facility for a more comprehensive assessment and definitive treatment.[3] This model often neglects to consider the particularity of human behavior and decision-making, risking inefficiencies in resource utilization and potential legal complications when a patient refuses transport to the hospital. Therefore, exploring the factors behind a patient's refusal of transportation to the hospital emerges as a research topic of interest and a clinical imperative. Previous studies have highlighted various aspects of this behavior, such as patient safety concerns and resource allocation.[4,5] However, these largely Western-centric examinations overlook the cultural and systemic variances in non-Western settings, particularly in the Middle East.[6]

In the same context and as part of its strategic vision, Qatar, a Middle Eastern country, like other Gulf Cooperation Council (GCC) states, exemplifies a system laden with its own complexities and ambitions.[6] It also seeks to elevate healthcare standards to world-class levels with its multinational population, which introduces an additional layer of complexity. Hamad Medical Corporation Ambulance Service (HMCAS) is Qatar's public provider of pre-hospital emergency medical care.[7] It responds to all pre-hospital emergency medical assistance calls received via its 999 hotline, using its well-equipped ground and aerial response units.[8,9] HMCAS also maintains a comprehensive electronic record of all pre-hospital patient encounters.[7,10] However, it is essential to note that not all patients who call 999 choose to be transported to hospital.[11] Despite HMCAS' policy to encourage hospital transportation due to the risk of under-triage and the limited availability of advanced in-hospital diagnostic equipment and specialized medical personnel, some patients choose to decline this service.[10]

Recent studies on HMCAS have found that of 93,712 emergency calls, 23.95% of patients were not transported to hospital after receiving emergency treatment in the pre-hospital setting.[12,13] This increasing rate of non-transported cases challenges resource allocation and operational efficiency in the emergency care system. Additionally, research indicates that the median time from ambulance dispatch to ambulance availability for non-transported patients was 73 minutes. This points to the need to understand patient decision-making in emergency contexts to optimize EMS resource utilization and response capabilities.[14]

To improve pre-hospital care, open-ended patient feedback proves invaluable in capturing the factors driving patients' decision-making on non-transportation. While traditional healthcare metrics are important, they lack the depth to provide a holistic view of the patient experience and its role in shaping emergency care decisions.[15] Open-ended responses can fill this gap by providing qualitative insights into patient decisions to refuse transportation to hospitals in a Middle Eastern context. Open-ended patient feedback helps enhance healthcare quality improvement (QI) initiatives.[16] Such feedback can provide a wealth of information that closed-ended questions fail to provide, and allows healthcare providers to explore in depth the factors influencing patient choices and satisfaction. By gathering this information, pre-hospital EMS can adapt their interventions and approaches to meet the specific needs and expectations of different patient populations. There is a significant gap in the existing scholarly literature concerning the role of open-ended patient feedback in out-of-hospital settings, which this study aimed to address in the context of understanding patient decisions to refuse transport to hospital. Recognizing the value of qualitative data in understanding patient experiences and behavior can drive meaningful changes, particularly in a culturally diverse environment such as the Middle East.

This study explored patients' perspectives on the factors influencing their decisions to refuse hospital transportation following a 999 emergency call.

STUDY DESIGN: METHODOLOGICAL FRAMEWORK, THEORETICAL FOUNDATIONS, AND DATA COLLECTION STRATEGIES

Following a detailed literature review, this research used a rigorous methodological framework. The author (HF) drafted the semi-structured interview questions in English, which were validated by the

other authors (GA, JL, MK, and PG). He then ensured their translation into Arabic for linguistic inclusivity. An independent linguistic validation was conducted by the author (KEA) to affirm the semantic integrity of the translated questions.

Information gathering infrastructure

The Business Intelligence (BI) division of HMCAS developed a specialized information gathering system using SQL (Structured Query Language). This system autonomously generated daily reports that included a targeted dataset of ePCR (electronic patient care records). These reports specifically identified patients who contacted HMCAS ERU (emergency response units) via 999 and received on-site medical care from paramedics but chose not to be transported to the hospital. This system was configured to automatically dispatch these reports to the author (HF) in PDF (portable document format) via email at 08:00 a.m. daily.

Sampling methodology

Purposeful sampling was used for participant selection, with data saturation being the criterion for determining a sufficient sample size. This study included patients who called 999 and were treated on-scene by HMCAS paramedics but refused transport to the hospital. Only the patients whose mobile phone number was available in the ePCR were included. Patients with only landline phone numbers were excluded due to sociocultural characteristics of Middle Eastern families, as most homes have many family members, sometimes including first-degree cousins.[17,18] In addition, people may not always be reachable on the landline phone. If someone else answered the phone, there was a risk of revealing information that the patient did not want to share that they had a health emergency.

The author (HF) created a statistical algorithm using the R® programming language to ensure a methodologically sound process for recruiting a nationally representative, random, and homogeneous sample. This algorithm facilitated the selection of daily interview subjects in a way that reflected broader demographic distributions. The curated list of prospective interviewees was then securely conveyed to the interviewers (MC, RT, FBR, MCA) via their email accounts associated with Hamad Medical Corporation (HMC).

Data collection

From June 15 to August 1, 2023, the researchers (MC, RT, FBR, MCA) conducted telephone interviews based on each respondent's language preference (Arabic or English). A minimum response rate of 70% was targeted for those who had availed HMCAS pre-hospital medical assistance within the last 24 hours and received on-site emergency care but declined transportation to the hospital. The interviewers transcribed, translated, and entered the collected data into a shared Microsoft Excel® spreadsheet accessible only by the research team via Microsoft Teams®. The interviews were conducted daily between 12:30 and 3:00 p.m. to avoid sleeping or prayer times for the Muslims since they represent most of Qatar's population.[19]

The interviewers explained the research context to the interviewees and emphasized their right to decline participation at any time up to the time of data analysis. Furthermore, they were informed that the interviews would be conducted anonymously. Identifiable personal information such as mobile phone numbers would be exclusively accessible to the first author and the designated interviewers, thereby ensuring stringent data confidentiality measures.

A carefully formulated two-stage contact protocol was adopted. First, each potential interviewee was contacted through a single telephone contact attempt. If this initial contact did not elicit a response or callback, a second contact attempt was made, scheduled two hours after the first attempt. This approach was designed to respect the participants' time while maintaining the integrity of the research process.

Data validation and analysis

The first author conducted a rigorous daily verification process of the translated transcripts to validate and ensure their accuracy and reliability. Subsequently, after data cleaning, a thematic content analysis was conducted using inductive coding, as all codes originated explicitly from the interviewees' responses. The aim was to ensure an appropriate interpretation of the collected data.

Moreover, a multi-stage coding approach was implemented. First, the collected data was divided into smaller analytical units for an in-depth examination. The author (HF) preliminarily reviewed the first

segment to identify emerging themes and systematically formulate an initial coding framework. Subsequently, additional researchers (KEA and FBR) rigorously applied this framework to the same data segment to corroborate its thematic congruence. A second data segment was then scrutinized, where all three researchers (HF, KEA, and FBR) applied the existing coding scheme independently and blindly. Any disparities or gaps within the coding structure were identified, discussed, and reconciled between the researchers. Accordingly, auxiliary codes were created, which were based on insights from the second data segment, and were subsequently integrated into the existing coding framework. This iterative method was continued, starting with the analysis of the second segment, until the entire dataset had undergone exhaustive coding. Finally, the triad of independently generated blind codes generated by the researchers (HF, KEA, and FBR) was reviewed and discussed together by more experienced researchers (GA and JL), resulting in a consensual determination of the most accurate coding to be retained.

Data analysis was conducted using NVivo® software version 12. The structure of this article adheres to the COREQ (COnsolidated criteria for REporting Qualitative research) checklist.

ETHICAL APPROVAL

This study was approved by the Institutional Review Board at the HMC Medical Research Center (MRC) under reference number MRC-01-22-264.

RESULTS

A total of 32 interviews (11 females and 21 males) were identified to reach the data saturation for qualitative analysis. The interviewees were assigned identifiers from P1 to P32 during the analysis. The five main themes identified were as follows: “Rationales for using 999 emergency services”, “Reasons for declining hospital conveyance”, “Subsequent steps after declining hospital transportation”, “Service satisfaction level”, and “Language barriers”. The themes and subthemes are summarized in Table 1.

For the theme “Rationales for using 999 emergency services”, musculoskeletal pain emerged as the predominant reason for calling 999, accounting for 20.51% ($n = 8$) of the codes identified for the theme. Traumatic injuries accounted for 15.38% ($n = 6$), while psychiatric problems accounted for 12.82% ($n = 5$). Cardiovascular conditions were rare, accounting for only 7.69% ($n = 3$) of the identified theme codes. In this context, nationality-specific patterns were observed: Qatari nationals primarily called for pain-related emergencies, while Sudanese nationals reported various health emergencies, including cardiovascular and renal problems (Table 2).

Table 1. Themes and subthemes identified during the study.

Themes	Subthemes	Codes determined by NVivo®	
		Frequency	Percentage
Rationales for using 999 emergency services	Musculoskeletal pain	8	20.51
	Systemic weakness	2	5.13
	Cardiovascular conditions	3	7.69
	Psychiatric disturbances	5	12.82
	Traumatic injuries	6	15.38
	Toxicological incidents	2	5.13
	Respiratory complications	5	12.82
	Renal concerns	2	5.13
	Non-specific medical conditions	4	10.26
	Obstetric complications	2	5.13
Reasons for declining hospital conveyance	Alleviation of symptoms post-paramedic intervention	25	48.08
	Aversion to extended hospital wait times	12	23.08
	Concerns over family members’ solitude	4	7.69
	Prior adverse hospital experiences	5	9.62
	Alternative healthcare strategies	4	7.69
	Unaddressed patient preferences	2	3.85
Subsequent steps after declining hospital transportation	Forwent subsequent medical attention	27	69.23
	Sought alternative medical care	8	20.51
	Ambulance services callbacks	4	10.26
Service satisfaction level	High level of satisfaction	30	93.75
	Infrequent dissatisfaction	2	1.03
Language barriers	Seldom encountered language difficulties	3	9.38
	Absence of linguistic impediments	29	90.63

Table 2. "Reason for calling" subtheme codes by frequencies per nationality.

Country	Number of participants	Pain	General body weaknesses	Cardiovascular	Mental issues	Accidents and injuries	Poisoning	Breathing problems	Renal issues	General health issues	Pregnancy complications
Algeria	1 Female	0	0	0	0	0	0	0	0	0	1
Bangladesh	1 Male	0	0	1	0	0	0	0	0	0	0
Egypt	1 Male	1	1	0	0	0	0	0	1	0	0
Eritrea	1 Male	0	0	0	0	0	0	0	0	1	0
Germany	1 Female	0	0	0	0	1	0	0	0	0	0
India	3 Males	0	0	0	0	2	0	0	0	1	0
Iran	1 Female	1	0	0	0	0	0	1	0	0	0
Jordan	1 Female	0	0	0	0	0	1	0	0	0	0
Kenya	1 Male	0	0	0	1	0	0	0	0	0	0
Lebanon	1 Male	0	0	0	0	1	0	0	0	0	0
Morocco	1 Male	0	0	0	0	0	0	1	0	1	0
Nepal	1 Male	1	0	1	0	0	0	0	0	0	0
Nigeria	1 Male	0	0	0	1	0	0	0	0	0	0
Pakistan	1 Male	1	0	0	0	0	0	0	0	0	0
Palestinian	1 Female	0	0	0	0	0	0	0	0	0	1
Philippines	1 Female	0	0	0	0	0	1	0	0	0	0
Qatar	3 Males 1 Female	2	1	0	0	1	0	0	0	0	0
Saudi Arabia	1 Female	0	0	0	0	0	0	0	0	1	0
South Korea	1 Male	0	0	0	0	0	0	1	0	0	0
Sri Lanka	1 Male	0	0	0	1	0	0	0	1	0	0
Sudan	2 Males	0	0	0	1	0	0	1	0	0	0
Syria	1 Female	1	0	1	0	0	0	0	0	0	0
Tunisia	1 Male	0	0	0	0	2	0	0	0	0	0
UAE	1 Male	0	0	0	0	0	0	1	0	0	0
UK	1 Female	1	0	0	0	0	0	0	0	0	0
Yemen	1 Female	0	0	0	1	0	0	0	0	0	0

For the theme "Reasons for declining hospital conveyance", symptom alleviation following paramedic intervention was the main reason, accounting for 48.08% ($n = 25$) of the identified theme codes. In a significant percentage of the coded text, 23.08% ($n = 12$) indicated that they were unwilling to endure longer hospital waiting times, revealing underlying concerns about hospital efficiency.

For the theme "Subsequent steps after declining hospital transportation", the interviewees opted not to pursue further medical attention in only 69.23% of the theme codes. In comparison, the interviewees explored alternative healthcare options in only 20.51% ($n = 8$) of the identified codes.

However, despite the numbers found in the previous themes, high satisfaction levels (93.75%) were reported in the "Service satisfaction level" theme, highlighting the overall effectiveness and public approval of the HMCAS.

In the theme "Language barriers", language considerations were largely insignificant, with 98% ($n = 205$) of the respondents reporting the absence of language barriers and confirming that language presented a minimal impact on the effective use of pre-hospital emergency services.

DISCUSSION

Rationales for using 999 emergency services

This study elucidated various factors that led to 999 emergency calls. This preponderance of pain-based calls aligns closely with previous studies conducted in other contexts.[20]

The nature of pain reported varied considerably and spanned multiple domains – from dental problems to somatic complaints such as headaches, abdominal pain, and musculoskeletal discomfort. This nuanced view of "*pain*" as a multidimensional construct was consistent with research finding that many pain-related problems were the main reason for calling emergency services.[20]

Furthermore, complaints related to minor injuries were also common. These were primarily road traffic accidents, falls, and wounds, a finding consistent with earlier research indicating that most of these calls were associated with low acuity.[21]

General health concerns were less common, but still noteworthy, including various symptoms such as fever, dizziness, and vomiting. Additionally, the data revealed emergency calls related to pregnancy complications and certain conditions such as renal colic, which, although less frequent, have significant implications for the overall healthcare system.[22]

Similarly, mental health-related reasons – including anxiety, convulsions, and dizziness – were also reported, adding a psychological dimension to the factors leading to 999 calls. This extends existing discourses surrounding the role of paramedics in relation to mental health cases.[23,24]

Cardiovascular problems – particularly hypertension and palpitations – were indicated in isolated instances. Breathing complications, including asthma and allergic reactions, were also present in the dataset, supporting previous research findings that respiratory problems are a common motivator for emergency service calls.[10,25]

Reasons for declining hospital conveyance

Alleviation of symptoms post-paramedic intervention

Patients often attributed their decision to decline hospital conveyance to perceptible improvements in their condition following on-scene paramedic interventions. Specifically, patients reported a range of improvements in pain alleviation, cessation of bleeding, stabilization of vital parameters, and an overall improvement in their symptom profiles. One respondent stated: "*My condition improved as a result of the treatment provided by the paramedics*" (P17), thereby obviating the need for further medical intervention. This phenomenon correlates strongly with existing literature and highlights the role of effective pre-hospital interventions in reducing the perceived urgency of subsequent medical care.[26]

Several participants further supported this theme by pointing to the objective markers of well-being, such as stabilized vital signs. One respondent noted: "*All my vital signs were good, and I felt better after receiving treatment from the paramedics*" (P8). This corroboration of subjective improvement in objective metrics provides a more robust justification for declining hospitalization, and in turn reflects findings from studies that emphasize the efficacy of pre-hospital care in stabilizing patients.[26] Furthermore, views regarding the sufficiency of pre-hospital intervention were reiterated by participants who specifically stated that assessing their vital signs, such as blood pressure, led to reassuring outcomes. One participant elaborated: "*The paramedics checked my blood pressure, and it was fine;*

therefore, I saw no need to proceed to the emergency department" (P16). This statement converges with a broader dialogue in the healthcare literature about the efficacy of pre-hospital vital sign monitoring as a determinant for further medical investigations.[27]

Aversion to extended hospital wait times

The reticence to engage with hospital conveyance was also significantly influenced by apprehension regarding prolonged waiting times and overcrowding in emergency departments (EDs). A recurring theme emerged from the data collected, underpinning the notion that anticipated time inefficiencies in the hospital environment deter patients from seeking further medical care. This thematic cluster was manifested through various descriptors, such as "*Perceived time inefficiency*" (P30) and "*Dissatisfaction with hospital overcrowding*" (P28). Such comments are not entirely surprising given the high number of ED patient visits at Doha's main public general hospital.[28]

Patients predominantly expressed reservations about the duration they would likely endure before receiving healthcare services, positing that this inefficiency would exacerbate their condition. For example, one participant framed their declination of hospital conveyance by stating: "*The wound dressing was nicely done, and I was afraid of the long waiting time in the ED*" (P10). This perspective resonates with broader studies highlighting the adverse impact of waiting times on patient satisfaction and healthcare outcomes.[29]

Similarly, multiple participants articulated a perceived futility in committing time to hospital settings. One such respondent elaborated: "*The waiting time in ED is long*" (P24). This sentiment is congruent with existing literature, which found that anticipated waiting times in EDs can act as a barrier to further care.[30] Furthermore, overcrowding emerged as a parallel concern among patients. This was exemplified by a participant who expressed trepidation about the dense occupancy of EDs, stating: "*I was afraid of the long waiting time in the ED*" (P8).

In an interesting divergence, one participant revealed an intention to travel to a less congested healthcare facility, illustrating the tactical avoidance of overcrowding. The participant elucidated: "*My preference was for XX hospital owing to its less crowded conditions; however, the paramedics could only convey me to the proximate facility*" (P21). Such proactive patient behavior further confirms the concerns raised in the literature regarding patient experiences and choices under the burden of healthcare services.[31] A recent study revealed that patients might consider various structural and process characteristics when choosing healthcare providers, including waiting times and perceived crowding.[32] Furthermore, research has shown that overcrowding in healthcare settings can negatively impact patient satisfaction and perceived quality of care.[33]

Concerns over family members' solitude

This was a nuanced theme of apprehension about the potential loneliness of family members should the patient accept transport to the hospital. This was often conjoined with previous concerns about long waiting times in healthcare facilities. For example, one respondent expressed dual concerns about family loneliness exacerbated by extended waiting periods within the ED, stating: "*My parents are alone at home, and the waiting time in the emergency is long*" (P29). This adds another layer to patients' multilayered decision-making process when considering hospital conveyance, which remains underexplored in the literature. The anxiety surrounding family solitude was particularly noticeable among participants with dependants. One respondent, who identified himself as the only adult in a household with children, expressed: "*Since I am the only adult present at home, I cannot leave my kids alone*" (P2). This converges with other research exploring the complexities of caregivers in healthcare decision-making, especially in emergencies.[34]

Therefore, in addition to addressing systemic inefficiencies such as waiting times, ambulance services should also consider introducing family-friendly policies or liaison services that could potentially mitigate such concerns and thereby enhance hospital conveyance rates where clinically advised.

Prior adverse hospital experiences

Among the many reasons elucidated by participants for refusing hospital conveyance, prior negative experiences in healthcare settings emerged as a key theme. Contributing sub-themes included emotional trauma and logistical inefficiencies that sometimes resulted in patients leaving the ED without being seen.[35]

For example, one participant recounted a harrowing experience of spousal loss in a hospital setting, stating: "*The demise of my spouse in a healthcare environment was traumatising, and I do not want to go to the hospital*" (P18). This sentiment echoes previous research reporting the long-term emotional repercussions of negative healthcare experiences.[36]

Similarly, logistical grievances focused on inefficiencies in the ED, such as long waiting times and unproductive healthcare encounters. One respondent articulated: "*I had a bad experience in the ED where I waited long and ended up returning home myself*" (P27). Another respondent supported this assertion by recounting: "*the paramedics tried to convince me to go to the hospital, but I had a previously bad experience of long waiting hours*" (P25).

A unique case was presented by a participant whose mother refused hospital conveyance for her child based on previous negative experiences, illustrating that previous experiences can have a cascading influence on healthcare decisions for family members. This participant asserted: "*I did not want my child to be taken to the hospital because of my previous negative experience, including long waiting time, and I do not want my child to suffer the same*" (P7).

Additionally, another interviewee declined transport to the hospital, citing discomfort in the ambulance: "*My last trip with the ambulance was not nice due to the inadequate bed size and air conditioning, and that's why I prefer using my private transport*" (P23). This finding aligns with previous research outcomes from the Middle East that advocated more patient-centered designs of ambulance services.[37] This comment is probably isolated, based on a decade-old experience before adopting a newer fleet of vehicles,[38] and may have involved a patient with high expectations of an ambulance stretcher.

Nevertheless, achieving a more patient-centered design of ambulance services is an intricate endeavor. The main focus of most ambulance service units is to optimize safety for paramedics and patients.[38] This safety-focused paradigm is often manifested in design features such as a variety of safety restrictions and prioritization of space for medical equipment. While these elements are crucial for ensuring safety, they inadvertently contribute to a more confined spatial experience in the ambulance. This tension between safety imperatives and patient comfort is not a new dilemma. It reflects a broader debate in the healthcare design literature discussing how integrating safety features into healthcare environments often comes at the expense of patient comfort and the overall experience.[39,40] This leads to the question: Can safety and patient-centered design coexist without mutually exclusive trade-offs? Further research is required to navigate this complex interplay, potentially drawing inspiration from areas such as automotive design, where safety and user experience have been more harmoniously integrated.

Unaddressed patient preferences

Patient preferences that were unaccounted for by HMCAS personnel also featured prominently as reasons for declining hospital conveyance. The restriction on hospital choices imposed by paramedics is due to protocols. Participants preferred specific hospitals, citing reasons ranging from perceptions of lower patient volume to the exigencies of health insurance coverage. One individual elucidated: "*The hospitals that they could transfer me to were not included in my insurance coverage*" (P22).

This poses a complex challenge in Qatar's healthcare landscape, where the national policy endeavors to balance equity between healthcare facilities and the specific medical needs of patients. The current policy framework prioritizes transferring patients to the most clinically appropriate healthcare facility with the necessary services, rather than just the nearest facility which may not be suitably equipped to manage their particular condition.

This policy orientation resonates with the emerging discourse in healthcare research that advocates for a more individualized, patient-centered approach to pre-hospital care. Numerous studies have highlighted the need to emphasize patient experiences and preferences in emergency care settings. For example, research proposes that a patient's choice of a healthcare facility should be incorporated into the decision-making process, which often requires a balance between clinical urgency and patient preference[41] as well as resource availability. Therefore, the existing literature corroborates the need for further research to develop a more nuanced, patient-centered ambulance service model that aligns with national healthcare goals while attending to individual patient needs and preferences.[41]

Alternative healthcare strategies

Another factor contributing to the reluctance of some patients to be transported to the hospital was the existence of alternative healthcare plans. Thematic patterns supporting this observation include

preferences for private healthcare facilities, in-home nursing care, and pre-scheduled medical appointments. For example, one participant expressed a preconceived plan to self-transport a family member to a specific hospital, stating: "*We wanted to convey him to XXX Hospital personally*" (P26). This sentiment was further corroborated by another participant who expressed a disinclination towards public EDs, preferring instead a private healthcare setting. The participant elucidated: "*I do not like the public ED and had arranged to go to a private healthcare institution*" (P19).

Additionally, some participants had already scheduled medical appointments, reducing the perceived utility of immediate hospital conveyance. One interviewee clarified: "*I had a consultation with my healthcare provider within five days*" (P4). Another participant, aware of an impending surgical procedure, opted out of hospital transportation, saying: "*Given my existing diagnosis of kidney stones and a surgery scheduled for the 20th, a visit to the hospital ED appeared unnecessary*" (P20).

Furthermore, in-home healthcare resources, such as a personal nurse, obviated some participants' need for hospital intervention. One interviewee noted: "*We have a nurse at home capable of providing adequate medical attention*" (P32). At the same time, another mentioned: "*Our neighbour, a nurse, had already managed the choking incident prior to the ambulance's arrival*" (P10).

Significantly, over three-quarters of the participants did not seek supplemental healthcare services and remained in their homes after the paramedic team intervention. However, some patients sought further medical consultation at a hospital, primary healthcare center, or private clinic, often using private vehicles or ride-sharing services. For example, one participant disclosed: "*After the initial care, I utilised my private vehicle for hospital transport*" (P31), while another revealed: "*I later accessed the hospital via an xxx service*" (P8).

A minority of participants reported deteriorating conditions that required a subsequent ambulance call. One participant recounted: "*Her condition degenerated several hours later, leading us to call back the ambulance and proceed to the hospital*" (P30). As discussed by a recent study, callbacks have been a crucial issue in Qatar.[11] This QI study aimed to reduce ambulance callbacks from patients with diabetes-related emergencies who had initially refused hospital transport, and showed that it was possible to reduce the rate of callbacks through patient education, but the improvement was not sustained.[11]

Subsequent steps after declining hospital transportation

A significant majority of participants, accounting for over 73% ($n = 163$), chose not to pursue additional medical care and remained at their homes following the intervention. This potentially suggests confidence in the initial emergency treatment and in the adequacy of staff training and experience levels, warranting further investigation into the sufficiency and effectiveness of pre-hospital care.

A minimal proportion of patients (3%; $n = 6$) revisited their decision to abstain from hospital care, ultimately calling back 999 after the initial treatment. This represents an important subset of patients whose symptoms persisted or exacerbated, requiring further medical evaluation.

Additionally, a notable proportion of participants (20.51%; $n = 8$) availed themselves of other healthcare facilities, including primary healthcare centers and private clinics. Modes of transportation for these alternative healthcare visits were varied, including private vehicles and public ride-sharing services. For example, one respondent explicitly expressed her decision to drive herself to the hospital by stating: "*I proceeded to the hospital using my own vehicle*" (P8). Another respondent shared: "*After the paramedic's intervention, I utilised a ride-sharing service, HMCAS, to get to the hospital*" (P13).

Moreover, several participants reported a relapse of symptoms that required a new 999 call. One particular case involved a patient who recounted: "*Symptoms worsened a few hours post-treatment, leading to a second emergency call and a subsequent hospital admission*" (P11).

These findings highlight the multi-faceted nature of patient decision-making following refusal for hospital transportation and emphasize the need for a more comprehensive follow-up system to monitor patient outcomes.

Service satisfaction level

Most patients were highly satisfied with the emergency healthcare services they received from the HMCAS. These patients described the care as "*exemplary*", "*helpful*", "*professional*", and "*outstanding*". This aligns with previous local research on quality of service delivery conducted with patients taken to a see-and-treat unit.[42] In contrast, a minority of respondents expressed varying levels of dissatisfaction, attributing this to factors such as delayed ambulance arrival, language barriers, and perceived inadequacies in the paramedic's attentiveness.

Furthermore, the study highlighted the imperative of involving patients in the continuous improvement of medical services. Of particular note was the need for an increased presence of female paramedics, which is particularly important in the religious and socio-cultural context of the region. For example, due to cultural sensitivities, female patients may be reluctant to undergo emergency procedures such as electrocardiograms when attended to by male paramedics. This hesitancy could compromise the accuracy of medical complaints reported to the hospital and require special on-site emergency protocols.

Additionally, an interviewee advocated including more linguistically diverse staff, particularly those proficient in German. Given that Qatar is a multicultural society, the HMCAS has already ensured that it employs a multilingual workforce mainly fluent in Arabic, English, and some Asian languages.[43] However, there remain gaps in language coverage, such as German. Although rare, they could pose a barrier to effective emergency care. Initiatives in other Middle Eastern countries – such as Saudi Arabia – have instituted multilingual interpreters in their National Command Centers to facilitate communication during pre-hospital emergencies.[44]

Language barriers

A few concerns were raised by the interviewees about language barriers, such as: "*The absence of multilingual medical personnel capable of interpreting my German-language prescription dissuaded me from opting for hospital conveyance*" (P5), which was addressed earlier. Furthermore, another participant stated: "*There was a difficulty in understanding the call-taker who was struggling when speaking in English*" (P9). It is essential to contextualize this issue within a broader framework of linguistic diversity and operational constraints. While Qatar has been striving for linguistic competence across all sectors,[45] it is crucial to understand that for most call-takers, English is not their first language. As reported by a plethora of scholarly works, non-native speakers may face phonological processing and syntactic construction difficulties, which can be exacerbated in the high-stress, rapid-response environments typical of EMS, including the 999 call center.[46,47]

Additionally, the mode of interaction – over the phone – can present complications. Telephone communication eliminates the availability of non-verbal cues such as facial expressions and gestures that often complement verbal communication.[48] This can be challenging even for native speakers and even more so for those working in a second language.[49] Another notable consideration pertains to the linguistic diversity of Qatar's population. Since Qatar is home to numerous expatriates from varied linguistic backgrounds, call-takers are often multilingual to accommodate many languages and dialects. In such an environment, the priority is to provide effective and immediate care. Sometimes call-takers are required to switch between multiple languages during a single shift, which could momentarily affect their linguistic precision in any given language.

Finally, several studies have highlighted that the pre-hospital setting is fraught with terminological complexities, requiring rapid and accurate dissemination of medical information.[50] Given this intricate landscape, occasional linguistic imprecisions should not overshadow the overarching objective of providing prompt and effective medical intervention.

While we acknowledge that linguistic clarity is an important factor and that we should strive for continuous improvement, it is important to recognize and appreciate the multilayered challenges that call-takers face when managing critical healthcare situations.

RECOMMENDATIONS

An adapted approach is essential to align with national healthcare objectives while designing services to meet individual patient needs and preferences. HMCAS needs to address the challenges identified. First, patient preference for specific hospitals warrants attention. In addition to developing a mobile application that could facilitate real-time approval of insurance companies for hospital conveyance, a national review of insurance policies for medical emergencies seems to be necessary. This review should explore expanding insurance coverage to hospitals that specialize in certain emergency conditions. Second, the traditional "hospital-at-all-costs" model needs reassessment, given the growing reliance on alternative healthcare strategies.[51] While there is a high risk of not transporting a patient to the hospital, a follow-up process should be implemented, such as introducing a telehealth follow-up system or a paramedicine community or non-transport unit comprising paramedics who could provide basic effective medical interventions and limit the inappropriate use of resources and expertise.[52,53] Third, there is a pressing need to improve service satisfaction by adapting pre-hospital

medical services to cultural and gender sensitivities. Increasing the number of female paramedics and expanding linguistic diversity, including underrepresented languages. Fourth, the challenge of language barriers could be mitigated by integrating multilingual interpreters in 999 call centers. Finally, addressing the critical issue of ambulance callbacks requires a robust post-intervention monitoring system, potentially involving text messaging surveys or additional follow-up calls, to assess both the efficacy of the initial service and any evolving patient health status.

LIMITATIONS

The varying rates of participant inclusion and actual data use highlight the complex challenges intrinsic to executing a methodologically robust investigation in the context of pre-hospital emergency care practice. The striking gap between those initially identified as meeting the study's criteria and those whose data ultimately contributed to the findings warrants further interrogation, especially concerning its implications for internal validity and external generalizability of this study.

Furthermore, the barriers to study participation – such as inaccurately recorded details in the ePCR and explicit refusals to participate – warrant further scrutiny, not only as logistical challenges but also as factors that could lead to potential biases in the results. The significant number of individuals who chose not to participate in the study (43.4%) also raises questions about psychosocial barriers or disincentives affecting participation rates in pre-hospital care research.

CONCLUSION

This study provided insights into the factors that influence patients' decisions to decline transportation to hospital following emergency treatment. These factors range from economic limitations and concerns about the well-being of family members to previous negative hospital experiences and neglected patient preferences. The data aligns with the imperative for a more patient-oriented model in Qatar's pre-hospital care setting according to the country's broader healthcare objectives. Additionally, the study brings to light key QI areas, including the need for gender-responsive services and linguistic inclusivity.

Importantly, the findings of this study lay a solid foundation for ensuing QI studies in pre-hospital care. It highlights the need to reform ambulance service protocols to make them culturally appropriate and fiscally viable. Moving forward, healthcare policymakers and practitioners need to integrate these results into their efforts to further develop and refine the delivery of emergency services.

ACKNOWLEDGMENTS

We would like to acknowledge the HMCAS executive and management team and the HMCAS BI Team for their support.

CONFLICT OF INTEREST

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

AUTHORS' CONTRIBUTIONS

Hassan Farhat contributed to the conceptualization, methodology, software, formal analysis and investigation, data curation, and preparation of the original draft. All authors read and approved the final version of the manuscript.

REFERENCES

[1] Jauch EC, Schwamm LH, Panagos PD, Barbazzeni J, Dickson R, Dunne R, et al. Recommendations for regional stroke destination plans in rural, suburban, and urban communities from the prehospital stroke system of care consensus conference: A consensus statement from the American Academy of Neurology, American Heart Association/American Stroke Association, American Society of Neuroradiology, National Association of EMS Physicians, National Association of State EMS Officials, Society of NeuroInterventional Surgery, and Society of Vascular and Interventional Neurology: Endorsed by the Neurocritical Care Society. Stroke. 2021 May;52(5):e133–52. doi: 10.1161/STROKEAHA.120.033228.

[2] Aringhieri R, Bruni ME, Khodaparasti S, van Essen JT. Emergency medical services and beyond: Addressing new challenges through a wide literature review. Comput Oper Res. 2017 Feb;78:349-368. doi: 10.1016/j.cor.2016.09.016.

[3] Gu H-Q, Rao -ZZ, Yang X, Wang C-J, Zhao X-Q, Wang Y-L, et al. Use of emergency medical services and timely treatment among ischemic stroke. Stroke. 2019 Apr;50(4):1013–6. doi: 10.1161/STROKEAHA.118.024232.

[4] Alrazeeni DM, Sheikh SA, Mobrad A, Al Ghamdi M, Abdulqader N, Al Gadgab M, et al. Epidemiology of non-transported emergency medical services calls in Saudi Arabia. Saudi Med J. 2016 May;37(5):575–8. doi: 10.15537/smj.2016.5.13872.

[5] Marks PJ, Daniel TD, Afolabi O, Spiers G, Nguyen-Van-Tam JS. Emergency (999) calls to the ambulance service that do not result in the patient being transported to hospital: An epidemiological study. Emerg Med J. 2002 Sep;19(5):449–52. doi: 10.1136/emj.19.5.449.

[6] Sharfi M. The GCC and global health diplomacy: The new drive towards artificial intelligence. In: Azar E, Haddad AN (eds.) Artificial intelligence in the gulf: Challenges and opportunities. Springer; 2021. p. 117–39. doi: 10.1007/978-981-16-0771-4_7.

[7] Irfan FB, Consunji RIGDJ, Peralta R, El-Menyar A, Dsouza LB, Al-Suwaidi JM, et al. Comparison of in-hospital and out-of-hospital cardiac arrest of trauma patients in Qatar. Int J Emerg Med. 2022 Sep;15(1):52. doi: 10.1186/s12245-022-00454-0.

[8] Hutton D, Alinier G. Ambulance service operational improvement. Int Paramed Pract. 2013 Aug;3(3):61–3. doi: 10.12968/ippr.2013.3.3.61.

[9] Demir S, Tunçbilek Z, Alinier G. Prehospital emergency health services in Qatar. J Paramed Pract. 2022 Nov 23;14(11). doi: 10.12968/jpar.2022.14.11.456.

[10] Farhat H, Abid C, El Aifa K, Gangaram P, Jones A, Khenissi MC, et al. Epidemiological determinants of patient non-conveyance to the hospital in an emergency medical service environment. Int J Environ Res Public Health. 2023 Jul 20;20(14):6404. doi: 10.3390/ijerph20146404.

[11] Farhat H, Alinier G, El Aifa K, Athemneh K, Gangaram P, Romero R, et al. Quality improvement tools to manage emergency callbacks from patients with diabetes in a prehospital setting. BMJ Open Qual. 2023 Jan;12(1):e002007. doi: 10.1136/bmjoq-2022-002007.

[12] Farhat H, Alinier G, El Aifa K, Makhlouf A, Gangaram P, Howland I, et al. Epidemiology of prehospital emergency calls according to patient transport decision in a middle eastern emergency care environment: Retrospective cohort-based. Health Sci Rep. 2024 Apr 23;7(4):e2056. doi: 10.1002/hsr2.2056.

[13] Farhat H, Makhlouf A, Gangaram P, El Aifa K, Howland I, Babay Ep Rekik F, et al. Predictive modelling of transport decisions and resources optimisation in pre-hospital setting using machine learning techniques. PLoS One. 2024 May 3;19(5):e0301472. doi: 10.1371/journal.pone.0301472.

[14] Farhat H, Makhlouf A, Gangaram P, Aifa KE, Khenissi MC, Howland I, et al. Exploring factors influencing time from dispatch to unit availability according to the transport decision in the pre-hospital setting: An exploratory study. BMC Emerg Med. 2024 Apr 29;24(1):77. doi: 10.1186/s12873-024-00992-1.

[15] Yu S, Abbas J, Draghici A, Negulescu OH, Ain NU. Social media application as a new paradigm for business communication: The role of COVID-19 knowledge, social distancing, and preventive attitudes. Front Psychol. 2022 May 19;13:903082. doi: 10.3389/fpsyg.2022.903082.

[16] Aouicha W, Tlili MA, Sahli J, Mtiraoui A, Ajmi T, Latiri HS, et al. Patient safety culture as perceived by operating room professionals: A mixed-methods study. BMC Health Serv Res. 2022 Jun;22(1):799. doi: 10.1186/s12913-022-08175-z.

[17] Fahiminiya S, Almuriekhi M, Nawaz Z, Staffa A, Lepage P, Ali R, et al. Whole exome sequencing unravels disease-causing genes in consanguineous families in Qatar. Clin Genet. 2014 Aug;86(2):134–41. doi: 10.1111/cge.12280.

[18] Inc I. Qatar country study guide volume 1 strategic information and developments. Lulu.com; 2016.

[19] DBpedia. About: Religion in Qatar [Internet]; 2023. Available from https://dbpedia.org/page/Religion_in_Qatar; 2023 [Accessed 3rd September 2023].

[20] Kennel J, Withers E, Parsons N, Woo H. Racial/ethnic disparities in pain treatment: Evidence from Oregon Emergency Medical Services Agencies. Med Care. 2019 Dec;57(12):924–9. doi: 10.1097/MLR.0000000000001208.

[21] Quatman CE, Mondor M, Halweg J, Switzer JA. Ten years of EMS fall calls in a community: An opportunity for injury prevention strategies. *Geriatr Orthop Surg Rehabil*. 2018 Jul 4;9:2151459318783453. doi: 10.1177/2151459318783453.

[22] Bills CB, Newberry JA, Darmstadt G, Pirrotta EA, Ramana Rao GV, Mahadevan SV, et al. Reducing early infant mortality in India: Results of a prospective cohort of pregnant women using emergency medical services. BMJ Open. 2018 Apr;8(4):e019937. doi: 10.1136/bmjopen-2017-019937.

[23] Hutchison T, Lees C, Lotto R, White A, Harris R. Clinical decision making and the challenges of responding to mental health needs. J Paramed Pract. 2019 Oct;11(10):434–9. doi: 10.12968/jpar.2019.11.10.434.

[24] Briggs H, Clarke S, Rees N. Mental health assessment and triage in an ambulance clinical contact centre. J Paramed Pract. 2021 May;13(5):196–203. doi: 10.12968/jpar.2021.13.5.196.

[25] Lindskou TA, Pilgaard L, Søvsø MB, Kløjgård TA, Larsen TM, Jensen FB, et al. Symptom, diagnosis and mortality among respiratory emergency medical service patients. PLoS One. 2019 Feb 28;14(2):e0213145. doi: 10.1371/journal.pone.0213145.

[26] Ebben RHA, Vloet LCM, Speijers RF, Tönjes NW, Loef J, Pelgrim T, et al. A patient-safety and professional perspective on non-conveyance in ambulance care: A systematic review. Scand J Trauma Resusc Emerg Med. 2017 Jul 17;25(1):71. doi: 10.1186/s13049-017-0409-6.

[27] Ong MEH, Padmanabhan P, Chan YH, Lin Z, Overton J, Ward KR, et al. An observational, prospective study exploring the use of heart rate variability as a predictor of clinical outcomes in pre-hospital ambulance patients. *Resuscitation*. 2008 Sep;78(3):289–97. doi: 10.1016/j.resuscitation.2008.03.224.

[28] Butt AA, Azad AM, Kartha AB, Masoodi NA, Bertollini R, Abou-Samra A-B. Volume and acuity of emergency department visits prior to and after COVID-19. J Emerg Med. 2020 Nov;59(5):730–4. doi: 10.1016/j.jemermed.2020.08.013.

[29] Paulin J, Kurola J, Koivisto M, Iirola T. EMS non-conveyance: A safe practice to decrease ED crowding or a threat to patient safety? BMC Emerg Med. 2021 Oct 9;21(1):115. doi: 10.1186/s12873-021-00508-1.

[30] Allen L, Cummings JR, Hockenberry JM. The impact of urgent care centers on nonemergent emergency department visits. Health Serv Res. 2021 Aug;56(4):721–30. doi: 10.1111/1475-6773.13631.

[31] Victoor A, Delnoij DMJ, Friele RD, Rademakers JJDJM. Determinants of patient choice of healthcare providers: A scoping review. BMC Health Serv Res. 2012 Aug 22;12(1):272. doi: 10.1186/1472-6963-12-272.

[32] Zhang A, Nikoloski Z, Albala SA, Yip W, Xu J, Mossialos E. Patient choice of health care providers in China: Primary care facilities versus hospitals. Health Syst Reform. 2020 Dec 1;6(1):e1846844. doi: 10.1080/23288604.2020.1846844.

[33] Bahadori M, Teymourzadeh E, Ravangard R, Raadabadi M. Factors affecting the overcrowding in outpatient healthcare. J Educ Health Promot. 2017 Apr 19;6:21. doi: 10.4103/2277-9531.204742.

[34] Dionne-Odom JN, Ejem D, Wells R, Barnato AE, Taylor RA, Rocque GB, et al. How family caregivers of persons with advanced cancer assist with upstream healthcare decision-making: A qualitative study. PLoS One. 2019 Mar 13;14(3):e-0212967. doi: 10.1371/journal.pone.0212967.

[35] Moinudheen J, Pathan SA, Bhutta ZA, Jenkins D, Silva AD, Sharma Y, et al. Marginal analysis in assessing factors contributing time to physician in Emergency Department using operations data. J Emerg Med Trauma Acute Care. 2016;2016(2-International Conference in Emergency Medicine and Public Health-Qatar Proceedings):7. doi: 10.5339/jemtac.2016.icepq.7.

[36] Bucki B, Spitz E, Baumann M. Emotional and social repercussions of stroke on patient-family caregiver dyads: Analysis of diverging attitudes and profiles of the differing dyads. PLoS One. 2019 Apr 13;14(4):e0215425. doi: 10.1371/journal.pone.0215425.

[37] Deros BM, Daruis DDI, Thiruchelvam S, Othman R, Ismail D, Rabani NF et al. Evaluation on ambulance design and musculoskeletal disorders risk factors among ambulance emergency medical service personnel. *Iran J* Public Health [Internet]. 2016 Mar;45(Suppl 1):52–60. Available from https://ijph.tums.ac.ir/index.php/ijph/article/view/6154 [Accessed 4th Sep 2023].

[38] Hutton D, Alinier G, Meyer J. Optimising the patient compartment design of ambulances in Qatar. J Emerg Med Trauma Acute Care. 2016 Oct;2016(2-International Conference in Emergency Medicine and Public Health-Qatar Proceedings):106. doi: 10.5339/jemtac.2016.icepq.106.

[39] Slattery DE, Silver A. The hazards of providing care in emergency vehicles: An opportunity for reform. Prehosp Emerg Care. 2009 Jul–Sep;13(3):388–97. doi: 10.1080/10903120802706104.

[40] Voitko A, Dobromirov V, Podoprigora N, Marusin A. Improving safety of using ambulance vehicles in large cities. Transp Res Procedia. 2020;50:716–26. doi: 10.1016/j.trpro.2020.10.084.

[41] Hanchate AD, Qi D, Stopyra JP, Paasche-Orlow MK, Baker WE, Feldman J. Potential bypassing of nearest emergency department by EMS transports. Health Serv Res. 2022 Apr;57(2):300–10. doi: 10.1111/1475-6773.13903.

[42] Carolus G, Singh KK, Abid JY, Alinier G. An ambulance service evaluation of quality control measures based on patients' perception in Qatar. J Emerg Med Trauma Acute Care. 2022 Jan;2022(1-Qatar Health 2022 Conference abstracts):55. doi: 10.5339/jemtac.2022.qhc.55.

[43] Alinier G, Dippenaar E, Gangaram P. Considerations on out-of-hospital pain assessment of a diverse population. Int Paramed Pract. 2021 Dec;11(4):99–102. doi: 10.12968/ippr.2021.11.4.99.

[44] ARABNWES. Multilingual 911 helpline to provide vital services during Hajj. Arab News [Internet]; 2019. Available from https://www.arabnews.com/node/1531421/saudi-arabia [Accessed 4th September 2023].

[45] Raza K, Reynolds D, Coombe C. Multilingual TESOL in practice in higher education: Insights from EFL classrooms at a Gulf University. In: Raza K, Reynolds D, Coombe C (eds.) Handbook of multilingual TESOL in practice. Springer Nature; 2023. p. 5–22. doi: 10.1007/978-981-19-9350-3_1.

[46] Gerchow L, Burka LR, Miner S, Squires A. Language barriers between nurses and patients: A scoping review. Patient Educ Couns. 2021 Mar;104(3):534–53. doi: 10.1016/j.pec.2020.09.017.

[47] Noack EM, Schulze J, Müller F. Designing an app to overcome language barriers in the delivery of emergency medical services: Participatory development process. JMIR Mhealth Uhealth. 2021 Apr 14;9(4):e21586. doi: 10.2196/21586.

[48] Aengst J, Walker-Stevenson G, Harrod T, Ivankovic J, Neilson J, Guise JM. Uncomfortable yet necessary: The impact of PPE on communication in emergency medicine. Int J Qual Health Care. 2022 Oct;34(4):mzac095. doi: 10.1093/intqhc/mzac095.

[49] Duffy ME. Translating instruments into other languages: Basic considerations. Clin Nurse Spec. 2006 Sep–Oct;20(5):225-6. doi: 10.1097/00002800-200609000-00006.

[50] Bremer A, Holmberg M. Ethical conflicts in patient relationships: Experiences of ambulance nursing students. *Nurs Ethics*. 2020 Jun;27(4):946–59. doi: 10.1177/0969733020911077.

[51] Thibault L-P, Marano M, Saad L, Doré-Bergeron MJ, Couture K, Gaucher N, et al. 99 Impact of COVID-19 pandemic on children with medical complexity: Parental perspective about the role of a Complex Care program. Paediatr Child Health. 2021 Oct;26(Suppl 1):e71–2. doi: 10.1093/pch/pxab061.081.

[52] Langabeer JR, Gonzalez M, Alqusairi D, Champagne-Langabeer T, Jackson A, Mikhail J, et al. Telehealth-enabled emergency medical services program reduces ambulance transport to urban emergency departments. West J Emerg Med. 2016 Nov;17(6):713–20. doi: 10.5811/westjem.2016.8.30660.

[53] Snooks HA, Dale J, Hartley-Sharpe C, Halter M. On-scene alternatives for emergency ambulance crews attending patients who do not need to travel to the accident and emergency department: A review of the literature. Emerg Med J. 2004 Mar;21(2):212–5. doi: 10.1136/emj.2003.005199.

Appendix. The patient's phone interview questions in English and Arabic (Qatari dialect)

English version

Hello, we are calling from the Ambulance Service Group Quality, Patient Safety and Risk Management at CCCC. My name is [*name of the interviewer*]. We understand that you called 999 last week. You were treated on scene by the ambulance crew and were not transported to the hospital. Is that correct?

We are conducting a research project to understand the factors contributing to not being transported to the hospital. We are trying to improve the services provided by CCCC Ambulance Service. Please give us 10 minutes to talk about it. I am collecting the data on an anonymized form. Hence it does not contain your name, and no record of this call will appear in your medical record with CCCC. Nobody will see your answers apart from the authorized researchers. The CCCC Medical Research Center has approved this study. Do you have any questions before I proceed?

You are free to stop or refuse to answer any of the questions I will ask. Do you agree to take part in this study through this telephone call?

1) How old are you?

2) Where are you from originally?

3) Could you please tell me about your current occupation/job?

4) Were you the one who dialed 999 last time or was it a family member?
5) Please describe the medical issue that made you to call 999?
6) Please could you explain why you did not go to the hospital by ambulance with the paramedics last time?
7) What did the paramedics tell you could happen if you didn't go to the hospital?
8) What did you do after the ambulance crew left? Did you go somewhere else for help, or did you have to call an ambulance again?
9) Did you have any language barriers?
10) How did you feel about the help you received from the person who answered your 999 call last time and from the paramedics when they arrived on scene? Can you share your thoughts about how it went?
11) Is there anything else you would like to tell us that could help us do a better job?

Thank you very much for your time and contribution to our study. As mentioned, your responses will remain confidential and will be combined with the responses from many other people we are currently contacting. Have a good day/afternoon. We remain at your disposal.

Arabic version (Qatari dialect)

مرحباً، نحن نتصل من خدمة الإسعاف قسم جودة وسلامة المرضى وإدارة المخاطر في CCCC. اسمي (اسم المقابل).حضرتك اتصلت بالرقم 999. تم علاجك من قبل طاقم الإسعاف ولم يتم نقلك إلى المستشفى. هل هذا صحيح؟
في امكانيه تعطينا عشر دقائق من وقتك للحديث عن الأسباب التي ساهمت في قرارك بعدم النقل إلى المستشفى؟ نحن نجري دراسة لمعرفة العوامل المساهمة تخلي المرضى يتصلون بالرقم 999 ولكن مايروحون إلى المستشفى. هذا من اجل تحسين الخدمات التي تقدمها خدمة الإسعاف في مCCCC . هذه البيانات تجمع بطريقه مجهوله. وبالتالي فإنه لا يحتوي على اسمك، ولن يظهر أي سجل لهذا الاتصال على سجلك الطبي معCCCC . لن يرى أحد إجاباتك باستثناء الباحثين المصرح لهم. وقد وافق مركز البحوث الطبية في معCCCC على هذه الدراسة. هل لديك أي أسئلة قبل أن أبدأ؟
أود أن أعلمك أنك حر في التوقف أو الرفض للإجابة على أي من الأسئلة التي سأطرح. هل توافق على المشاركة في هذه الدراسة من خلال هذا الاتصال الهاتفي؟

Phone number	Phone number
Date of the call	Date of the call
Time of the call	Time of the call
Name (Initials)	Name (Initials)
1. How old are you?	1. كم عمرك؟
2. Where are you from originally?	2. من اي بلد انت في الاصل ؟
3. Could you please tell me about your current occupation/job?	3. شلون توصف طبيعة عملك الحالي للغير؟
4. Were you the one who dialed 999 last time or was it a family member?	4. تتذكر منهو الشخص الي اتصل على الخدمة؟ أنت أو العايلة؟
5. Please describe the medical issue that made you to call 999?	5. شنهي الحالة الطبية الي خلتك تطلب خدمة الإسعاف عبر دق الرقم 999؟
6. Please could you explain why you did not go to the hospital by ambulance with the paramedics last time?	6. زين ليش ما حبيت تروح المستشفى؟
7. What did the paramedics tell you could happen if you didn't go to the hospital?	7. تذكر إذا المسعف شرحلك المخاطراو للي ممكن تترتب اذا مارحت للمستشفى؟
8. What did you do after the ambulance crew left? Did you go somewhere else for help, or did you have to call an ambulance again?	8. رحت للقطاع الخاص أو بروحك عشان تجد شخص يساعدك طبيا بشكل أسرع؟ زين وين رحت؟ ما جاء على بالك تتصل ثاني مرة على الإسعاف؟
9. Did you have any language barriers?	9. هل واجهت مشكل في اللغة
10. How did you feel about the help you received from the person who answered your 999 call last time and from the paramedics when they arrived on scene? Can you share your thoughts about how it went?	10. عطنا رأيك عن رضائك للخدمة المقدمة من **قبل عامل الاتصالات الطبيه** في المرة الاخيره التي اتصلت فيها على الرقم 999و **من المسعفين** ؟
11. Is there anything else you would like to tell us that could help us do a better job?	11. عطنا شورك في تطوير الخدمة للأفضل؟

شكرا جزيلا لك على وقتك ومساهمتك في دراستنا. كما ذكرنا، ستظل أجوبتك سرية وستجمع مع الأجوبة من العديد من الآخرين الذين نتواصل معهم حاليا. أتمنى لك يوما جيدا. نحن في خدمتك. الأشخاص