

# Cabin Crew Perceptions toward Medications used during In-Flight Medical Emergencies in Saudi-Based Airlines: A Cross-sectional Study

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## Abstract

In-flight medical emergencies are rare but serious circumstances require immediate actions in an isolated space with potential language barriers as well as limited privacy and resources. This study evaluates the familiarity of flight crewmembers with regard to the use of different medications during in-flight medical emergencies among Saudi-based airlines. A quantitative cross-sectional study was conducted in January 2018. A survey was administered to 84 airline crewmembers who were working at Saudi-based airlines. About 55 (65.5%) and 11 (13%) of the participants had used a first aid kit and automated external defibrillator in in-flight medical emergencies during the last year, respectively. Two-thirds (61.9%) of the responders had used an emergency medical kit 1 to 10 times in the last year during in-flight medical emergencies. Furthermore, 41.6% of the crewmembers were not familiar with dealing with medications stored in the emergency medical kit, and only 41.6% of the participants were familiar with the drug names and their indications. In-flight crewmembers need educational sessions to understand the indications of the medications contained in the emergency medical kits used during in-flight emergencies.

## Keywords

In-flight medical emergencies; Emergency medical kit; First Aid kit; Airline intervention; Upper tract deterioration; Pediatric; Neurogenic bladder

## Introduction

In-flight medical emergencies (IMEs) are rare but serious circumstances require immediate actions. These situations are particularly important because they occur in an isolated space, and there may be limitations such as language barriers as well as limited privacy and resources. According to recent statistics,

about four billion passengers fly annually worldwide on commercial airlines, and about 44,000 IMEs occur every year. Flights involve traveling at more than 35,000 feet with minimal medical facilities, often hours away from the nearest medical hospital, and emergency treatments in this context represent a daunting experience for many health care practitioners<sup>(1)</sup>.

Domestic and international aviation authorities and organizations provide standardized in-flight cabin crew training for such situations. Cardiopulmonary resuscitation (CPR) and automated external defibrillator (AED) training are mandatory for all in-flight cabin crewmembers<sup>[2]</sup>. Medications are sometimes used and stored in a secured case called an emergency medical kit (EMK); also known as a doctor kit in Saudi-based airlines). The medications in these kits may include dexamethasone, loperamide, isosorbide dinitrate, furosemide, diazepam, salbutamol, and xylometazoline nasal spray.

Many systematic reviews have addressed this topic, but they show wide variability in the available services, expertise, and supplies required for the optimal management of different IMEs<sup>[1]</sup>. Furthermore, the majority of review studies are based on American, Canadian, or European airlines<sup>[3]</sup>. A clinical review has shown that IMEs most often include symptoms of near-syncope and gastrointestinal, respiratory, and cardiovascular symptoms. During these emergencies, healthcare professionals can help as part of a collaborative team that involves the flight crew and doctors on the ground.

Saudi-based airlines follow the regulations of the General Authority of Civil Aviation (GACA)<sup>[4]</sup>, so the cabin crew members receive annual training for CPR, AED, and first aid. Although they can easily access the AED and first aid kit, they are clearly instructed not to open the EMK without the presence of an active-licensed physician to utilize it. The presence of the EMK is mandatory in the cabin, and the aircraft is not allowed to take off without one. The EMK contains several types of medications used for different indications. However, to our knowledge, there are no data describing in-flight crewmembers' awareness regarding medications contained in the EMK in Saudi-Based airlines. Thus, the purpose of this study is to evaluate the familiarity of flight crewmembers regarding the different medications that can be used during IMEs among such airlines.

## Methods

A cross-sectional study was conducted based on an electronic questionnaire between January 1 and 30, 2018. Consent was obtained before the responses were obtained and participants agreed to answer the questionnaires. A link to a designed electronic questionnaire for this purpose was sent via WhatsApp.

The questionnaire was semi-structured and consists of 11 questions in three sections. The first section included questions regarding demographic data, and the second section included questions regarding knowledge about medications in the first aid kit. The third section asked about previous experience in using first aid kits during IMEs. A preliminary questionnaire was critiqued and validated by an assistant professor from the pharmacy practice department who specializes in medication safety. A clinical pharmacist also reviewed the questionnaire and suggested changing the knowledge items from a true-or-false format to multiple-choice questions instead.

A 5-point Likert scale for rating agreement with statements was used in some questions. The survey was distributed to cabin crews in English through a frequently used smartphone application, WhatsApp (WhatsApp Inc.), and through Google forms (Google Inc.). All survey questions were mandatory to answer, and no sort of compensation was provided for completing the survey. The survey began with obtaining electronic consent, which was mandatory before respondents could proceed<sup>[5]</sup>. We included flight attendants from Saudi-based airlines from all nationalities in the study. We initially targeted flight attenders but we have more response from more cabin crew. Data were entered into Microsoft Excel, and a descriptive analysis was performed.

## Results

The survey was sent to 150 individuals, but 84 participants completed the questionnaire (response rate: 56%). The majority of respondents were working in Saudi Arabian Airlines (91.6%), and the rest of them were working for the Flynas Airlines. Male respondents were the majority at more than 89%. One-third of the respondents work as co-pilots (34.5%), whereas one-quarter of them work as flight attendants (Table 1).

One-third of the respondents (34.5%) reported that they had not used a first aid kit in IMEs in the last year, while the rest of the respondents had at least once. Most respondents (87%) had not used an AED in the last year, but 12% reported that they had, and 1% of respondents had used it more than 10 times in the last year. Two-thirds of the respondents (61.9%) reported that they had used an EMK fewer than 10 times, while one-third of them had not used it at all in the last year (Table 2).

**Table 1. Demographic data**

Item	Number (of 84 participants)	Percentage
Gender		
Male	75	89.3%
Female	9	10.7%
Job Description		
First officer (Co-pilot)	29	34.50%
Cabin crew (flight attendant)	21	25%
Pilot in command (captain)	17	20.20%
Cabin manager (supervisor)	13	15.50%
Ground operation	1	1.20%
Inspector	1	1.20%
Others	2	2.4%
Workplace		
Saudi Arabian Airlines	77	91.7%
Flynas	6	7.1%
Saudi Gulf Airlines	1	1.2%

**Table 2. Previous use of a first aid during an in-flight medical emergencies in the last year**

Item	Number	Percentage (%)
Use of first aid kit in the last year		
None	29	34.50%
1-10 times	47	56%
10-20 times	4	4.80%
20- 30 times	1	1.20%
More than 30 times	3	3.50%
Use of the automated external defibrillator (AED) in the last year		
None	73	87%
1-10 times	10	12%
10-20 times	1	1%
Use of the emergency medical kit last year		
None	31	36.90%
1-10 times	52	61.90%
More than 30 times	1	1.20%

There were 35 respondents (41.6%) who reported that they did not know the medication in the EMK (neither the drug name nor the indication for the medications), whereas 41.6% of them had only a little knowledge, such as the name of the drug and its indication. The most recognized medications among the drugs stored in the EMK were diclofenac and xylometazoline nasal spray (39.3%), followed by ventolin and diazepam (28.6% and 23.8%, respectively). Furthermore, 37% of them did not recognize any of the medications (Table 3).

The most common in-flight medical emergency that the respondents faced was breathing problems, which they encountered 65 times, followed by heart problems, which occurred 35 times, while the child delivery process happened 9 times. Two-thirds of the participants (62%) always asked the passengers about

their home medications, while 23.8% never asked about home medications during an IME. Only one-third of respondents (29.2%) said they always utilized ground-based medical assistance during IMEs, and 9.5% of them reported that this service had not been applicable during the situation (Table 4).

## Discussion

Although IMEs are rare, medical emergencies happen during commercial airline travel daily, and physicians and other health care providers are often called upon to assist ill passengers. Having basic knowledge on how to deal with IMEs and awareness of the available services will help flight crewmembers become successful responders. The EMK available on any commercial airliner is generally sufficient to initiate treatment for serious problems. Most IMEs are self-

**Table 3. Level of familiarity with the emergency medical kit**

Item	Number	Percentage (%)
Familiarity of respondents with emergency medical kit medications		
None-familiar	35	41.60%
Mild (drug name+ indication)	35	41.70%
Moderate (drug name + Indication+ Dose)	10	12.00%
Advance (Drug name + Indication+ Dose+ Administration)	4	4.70%
Familiarity of the respondents with drugs		
None	31	37%
Diclofenac	33	39.30%
Xylometazoline nasal spray	33	39.30%
Ventolin	24	28.60%
Ranitidine	21	25%
Diazepam	20	23.80%
Nitroglycerin	14	16.70%
Dexamethasone	7	8.30%
Lasix	6	7.10%

**Table 4. In-flight medical emergencies**

Item	Number	Percentage (%)
In-flight medical emergency		
Breathing problem	65	
Heart problem	35	
Abdominal problem	17	
Child delivery	9	
Neurological	8	
Passengers with home medication during in-flight medical emergency		
Always	52	62%
Never	20	23.80%
Often	5	5.90%
Sometimes	7	8.30%
Use of ground-based medical assistance during in-flight medical emergencies		
Always	25	29.80%
Never	14	16.70%
Not applicable	8	9.50%
Often	15	17.80%

limiting or are effectively evaluated and administered without interrupting the planned flight route. Severe conditions are unusual, and death is uncommon<sup>[6]</sup>.

Our key finding from this survey is that 42% of the responders had no familiarity with the medications stored in the EMK, which may indicate the necessity of investigating the need for educational intervention for airline crewmembers. Another finding is that around 20% of the responders do not ask for the history of home medication. Several studies show that the most common in-flight emergencies are syncope, respiratory symptoms, nausea or vomiting, and cardiac symptoms. Our findings are consistent with the results of previous studies<sup>[3]</sup>. Another study showed that deaths were recorded during flights in 13 patients with a median age of 77 years (IQR: 69-82 years)<sup>[7]</sup>. Also,

some studies showed that cardiovascular problems among passengers are most frequent in middle-aged travelers, and flight diversions happened in about 11% of cases<sup>[8]</sup>.

In Saudi Arabia, GACA applies a clear restriction where the EMK must be used in only the presence of an active medical doctor with a valid license<sup>[4]</sup>. This restriction is applied in commonly used over-the-counter medications, such as those that can help to stop nausea and vomiting, as well as other prescriptions that can help in minimizing the risk of deterioration, such as medical inhalers to treat asthma. Our study shows that the crewmembers varied in their familiarity with the indications of the medications. Previous studies focused only on the role of authorizing aviation organizations to mandate the availability of EMKs.

Common challenges on board an aircraft to provide medical care include limited space and equipment. In unfamiliar settings, doctors might rely on what they know best, including making specific diagnoses based on their areas of expertise. The crew may call on doctors and other healthcare providers for more serious cases, which could help explain the higher rates of flight diversion and hospital treatment when health care practitioners receive on-board support. All flight crews are advised to use the referral service for any medical emergency that occurs in flights<sup>[1-3]</sup>.

The data collected on these consultations were restricted for the use in this survey. This study had many limitations, including a small sample size, selectivity bias by assessing only Saudi-based airlines, and the nature of questionnaires. Further study is needed to examine the differences between airlines in terms of the possibility of diversion and transport for emergency medical services.

### Conclusion

In-flight crewmembers need more education to understand the indications of the medications contained in the EMKs during in-flight emergencies. This study may encourage further studies to demonstrate the possibility of having pharmacists help in the utilization of EMKs since they are medication experts.

### Conflict of Interest

The author declared that there is no conflict of interest that is related to this study and this article.

### Disclosure

The author did not receive any type of commercial support either in the form of compensation or financial support for this case report. The author has no financial interest in any of the products, devices, or drugs mentioned in this article.

### Ethical Approval

The study was approved by the Ethics Committee of the KAUH in Jeddah, Kingdom of Saudi Arabia, also known as the Institutional Review Board of Hospitals.

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## تصور طاقم الطائرة تجاه الأدوية المستخدمة في حالات الطوارئ الطبية أثناء الطيران في الخطوط الجوية السعودية: دراسة مستعرضة

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**المستخلص.** حالات الطوارئ الطبية على متن الطائرة هي حالات نادرة ولكنها خطيرة تتطلب إجراءات فورية في مكان منعزل به حواجز لغوية محتملة بالإضافة إلى محدودية الخصوصية والموارد. تقيم هذه الدراسة مدى إلمام أفراد طاقم الطائرة باستخدام الأدوية المختلفة أثناء حالات الطوارئ الطبية على متن الطائرة بين شركات الطيران التي تتخذ من السعودية مقراً لها. تم إجراء دراسة مقطعية كمية في يناير ٢٠١٨. تم إجراء مسح على ٨٤ من أفراد طاقم شركة الطيران الذين كانوا يعملون في الخطوط الجوية السعودية. استخدم حوالي ٥٥ (٦٥,٥%) و ١١ (١٣%) من أعضاء الطاقم مجموعة إسعافات أولية ومزيل الرجفان الخارجي الألي في حالات الطوارئ الطبية أثناء الرحلة خلال العام الماضي، على التوالي. استخدم ثلثا المستجيبين (٦١,٩%) مجموعة أدوات طبية للطوارئ من ١ إلى ١٠ مرات في العام الماضي خلال حالات الطوارئ الطبية أثناء الرحلة. علاوة على ذلك، لم يكن ٤١,٦% من أفراد الطاقم على دراية بالتعامل مع الأدوية المخزنة في حقيبة الطوارئ الطبية، و ٤١,٦% فقط من المشاركين كانوا على دراية بأسماء الأدوية ودواعيها. يحتاج أفراد الطاقم على متن الطائرة إلى جلسات تثقيفية لفهم مؤشرات الأدوية الموجودة في مجموعات أدوات الطوارئ الطبية المستخدمة أثناء حالات الطوارئ على متن الطائرة.

**الكلمات المفتاحية:** حالات الطوارئ الطبية على متن الطائرة؛ طقم الطوارئ الطبي؛ حقيبة إسعافات أولية؛ شركة طيران