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Willingness and self-confidence of healthcare workers in Bahrain in assisting with in-flight emergencies

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Abstract:

BACKGROUND: In-flight medical emergency (IFE) impose considerable challenges on healthcare workers (HCWs) because of limited resources, constrained environment, and medico-legal issues. This study assessed HCWs knowledge, willingness, and confidence in addressing in-flight medical emergencies.

MATERIALS AND METHODS: A cross-sectional study was conducted between June and August 2023 among nurses and physicians working in primary healthcare centers and governmental hospitals in Bahrain. Subjects were selected using stratified random sampling; a self-administered online questionnaire of high reliability (Cronbach alpha = 0.914) was used to collect the data. Logistic regression analysis were performed to determine association of knowledge, willingness, and confidence in dealing with in-flight emergencies with various characteristics of HCWs.

RESULTS: The study included 805 HCWs with mean age of 35.5 years (SD=9.2). The findings indicated deficiency in training, with <10% of participants trained on IFE. A considerable proportion of participants exhibited low levels of knowledge (88.3%) and confidence (75.9%) with IFE. Nonetheless, more than half of the participants expressed the willingness to assist in IFE (59.1%). Non-Bahraini healthcare professionals (odds ratio [OR] = 2.901, $P < 0.001$) had higher knowledge of IFE. Nurses (OR = 1.642, $P = 0.047$) and participants with longer work experience had higher willingness to assist in IFE. In addition, professionals who were non-Bahraini (OR = 3.249, $P < 0.001$), working in secondary care (OR = 1.619, 95% confidence interval $P = 0.021$), had had training on IFE (OR = 2.247, $P = 0.004$), and had encountered IFE before (OR = 1.974, $P = 0.006$) had greater self-confidence levels.

CONCLUSION: Considering the low levels of knowledge and confidence healthcare professionals in Bahrain had with regard to IFE, targeted training initiatives and educational programs are necessary to improve HCW's confidence and preparedness to deal with such emergencies.

Keywords:

Healthcare workers, in-flight emergencies, passenger safety, training, travel

Introduction

Medical emergencies are sudden life-threatening events that can occur in any setting including in an aircraft. Any medical condition and emergency that occurs during air travel is considered an In-flight medical emergency (IFE).^[1] Similar

to any emergency, IFE necessitates prompt evaluation and management. Compared to other settings, IFE is more challenging owing to limited resources, constrained environment, altered physiology of passengers, and medicolegal issues.^[1,2] A large systematic review revealed that the incidence of IFE is around 18/1,000,000 passengers.^[2] Approximately 22–33 IFE occurs daily.^[3]

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Although all medical emergencies can occur onboard, vasovagal attacks, presyncope, respiratory symptoms, nausea and vomiting, and cardiovascular symptoms, including cardiac arrest and seizures are the most commonly reported conditions. In addition, flight anxiety, burns, and soft-tissue injuries occur in flight. Most medical emergencies on board occur either as a result of the worsening of preexisting medical conditions such as ischemic heart disease and bronchial asthma or changes in an individual's physiology.^[4,5]

Within 10 min of takeoff, commercial aircraft reach a cruising level of 31,000–38,000 feet and consequently a reduction of the mean arterial oxygen saturation from 97% to 93%. Aircraft is pressurized to 8000 feet above sea level leading to the expansion of closed gas-containing spaces such as the sinuses and middle ear. Consequently, any preexisting condition of sinusitis or an upper respiratory tract infection might worsen.^[6] In addition, prolonged hypobaric hypoxia and immobilization lead to venous stasis and a hypercoagulable state because of platelet and clotting factor activation that can result in deep vein thrombosis and pulmonary embolism.^[7]

Although the literature revealed that cabin crew addresses most IFE, some cases require the assistance and management of healthcare workers (HCWs), nonetheless, studies have found that almost half of IFE recovered without any complications.^[8]

Previous studies have investigated the willingness of physicians to act in IFE settings. For instance, a study conducted in Saudi Arabia found that the majority of HCWs stated that they require training to address IFE; only 42% stated that their knowledge and skills of IFE were adequate.^[8] Although in the latter study, most participants reported positive attitudes toward participation in IFE, approximately half of the participants worried about the subsequent medicolegal issues.^[9] Another study of family medicine residents in Saudi Arabia concluded that 46% of the residents were not sure of their competence in managing IFE and 93% reported that they required more training in this field.^[10]

Furthermore, several studies that assessed the knowledge of IFE reported that the overall HCWs' knowledge of IFE was poor. According to a Malaysian study, for instance, the knowledge score of primary HCWs of IFE was <50%, and approximately 10% only of the HCWs were confident in managing such emergencies.^[11] Moreover, another study of medical students revealed low levels of confidence in treating onboard emergencies.^[12] Similar findings were reported by other studies.^[8,13]

The determinants of self-confidence and willingness to assist in IFE have been assessed in some studies. Male

professionals, professionals with long work experience, professionals who had had training in IFE, and those who had previously encountered IFE had higher confidence and willingness levels.^[8] In addition, some studies found no relationship between HCWs sociodemographic characteristics and knowledge of IFE.^[9,10]

Although a few studies have been conducted globally on the commonly encountered medical emergencies and the willingness of HCWs to help in such situations, no studies have been conducted to assess the willingness and self-confidence of healthcare professionals in Bahrain in assisting with IFE. Considering the upsurge in air travel and scarcity of data on this topic in the region and Bahrain, the aim of this study was to assess the willingness and confidence of HCWs in Bahrain to deal with IFE.

Materials and Methods

This cross-sectional study was conducted in primary and secondary care settings between June 10, and August 31, 2023. Ethical approval was obtained from the Institutional Review Board vide letter number 61060623 dated 06/06/2023, and written informed consent was taken from all participants in the study.

The primary healthcare system in Bahrain is composed of 28 governmental health centers that provide primary care services, and governmental hospitals that provide secondary healthcare services to most residents and citizens. All working physicians and nurses in governmental primary and secondary care settings were eligible to participate in the study. Physicians and nurses who had long-term leave and those working in management were excluded. Taking into consideration a target of 95% confidence interval (CI) and a 5% margin of error, a sample size of 384 patients was needed to predict statistical significance. To compensate for the design effect, a sample size of 768 participants was targeted.

Since this study was conducted on nurses and physicians working in primary and secondary care settings in Bahrain, each group (i.e. nurses and physicians) was considered a stratum. The research team obtained the contact details of the persons in charge of each department. The physicians and nurses in charge were contacted for the list of their employees and a random sample was taken. Then, the employees were invited by phone calls and or WhatsApp messages. The invitation presented a link to the online questionnaire. The link did not accept multiple responses from the same participant.

The first section of the three-part questionnaire assessed the baseline characteristics of the participants and their past experience with IFE. The questions in this section included age, sex, nationality, years of experience,

profession, and qualifications as well as the experience with IFE. The second part assessed willingness (4 questions) and confidence (7 questions), while the third part consisted of 24 questions on knowledge of IFE. The answers to knowledge questions had yes, no, and I do not know options, while the responses to willingness and self-confidence questions had five options ranging from strongly disagree to strongly agree. The components of the questionnaire were taken from previously published articles.^[8,10] An online version of the self-administered questionnaire was formulated using Google Forms.

Knowledge was classified into low and high levels. HCWs who answered more than 50% of the questions correctly were considered to have a high level of knowledge. A low level of knowledge was defined as answering <50% of the knowledge questions correctly. The overall willingness and confidence levels were assessed by adding the responses to the items. Positive responses (willing to help/confident) were scored as 1 while negative responses (unwilling to help/unconfident) were scored as 0. Low levels of willingness and confidence were set for those who scored <50% out of the total responses in each section.

A pilot study was done to ensure the clarity, reliability, and content validity of the questionnaire and determine the time required to complete the questionnaire. No modifications were made to the content of the study, but the sequence of questions was modified. The Cronbach alpha coefficient was 0.914.

Data were analyzed using the Statistical Package for the Social Sciences (IBM Corp. Released 2020. IBM SPSS Statistics for Windows, version 26.0. Armonk, NY, USA: IBM Corporation). Categorical variables were presented as frequencies and percentages while continuous variables were presented as mean and standard deviations. As appropriate, univariable analysis was conducted using Chi-square, Fisher's exact, and *t*-tests. Then, a logistic regression was performed and the significance level was set at $P < 0.05$.

Results

Out of 965, a total of 805 HCWs participated in the study yielding a response rate of 83.4%. The mean age of study participants was 35.5 years (SD=9.2). About 82% of the participants were females, were Bahraini (80.1%), and worked in primary healthcare centers (79.9%) (Table 1). Approximately, two-thirds of the participants were nurses and had a practice experience of 10 years or less (59.0%). In addition, <10% of the participants had received IFE training. Of the entire study participants, 15.3% reported they had encountered IFE and 11.2% provided medical assistance in the IFE.

Cardiovascular and respiratory cases were the most commonly encountered emergencies (47.2% and 16.3%, respectively).

Table 2 presents the HCWs willingness and self-confidence statements in assisting with in-flight emergency. More than half of the participants (57.5%) reported that they would identify themselves as doctors/nurses and offer assistance in the event of an IFE and 53.8% disagreed with the statement "I will not offer assistance if I am not familiar with the nature of the emergency, even though I am the only HCWs onboard". In response to the statement "I would stay out of an IFE if someone else were already offering their assistance," 40.0% of participants disagreed or strongly disagreed. For the statement "the benefits of prostate cancer screening outweigh the risks," 51.4% agreed and 22.0% disagreed. Nearly, one-third of the participants were fearful of the medicolegal implications that could arise from assisting with IFE (32.5%). Furthermore, 70% of healthcare professionals reported that they needed more training in managing IFE. Although around 50% of the participants reported that their medical training had given them adequate knowledge and skills to assist in a medical emergency on the ground (45.6%), only a quarter of the healthcare professionals reported that their medical training had given them adequate knowledge and skills to render assistance during an IFE (27.3%). Less than 20% of the participants reported that they had an adequate understanding of the available medical supplies on airplanes (17.9%), the training of the aircrew in managing IFE (17.9%), and how the aircrew, ground-based medical control, and the onboard volunteer HCWs collaborate to manage IFE (18.1%) [Table 3].

Two-thirds of participants correctly answered that cabin crews are trained in basic life support and 60% of them stated correctly that long flights are associated with an increased risk of venous thromboembolism. Less than one-third of the HCWs correctly answered the questions about the diversion of the plane on account of IFE and the responsible body for the final decision to divert the plane (30.1% and 11.6%, respectively).

In addition, more than half of participants correctly recognized that sphygmomanometer (57.8%), intravenous catheters (53.4%), epinephrine/ adrenaline injectable (63.1%), dextrose 50 injectable (59.5%), and oral aspirin (62.0%) are carried on an aircraft.

Although the results showed a high willingness to assist in IFE (59.1%), a substantial proportion of HCWs had little knowledge ($n = 711$, 88.3%) and confidence levels ($n = 611$, 75.9%) [Table 4]. Noncitizen HCWs ($P = 0.001$) and nurses ($P = 0.007$) had higher knowledge scores. In addition, nurses ($P = 0.001$) and

Table 1: Characteristics of healthcare professionals in Bahrain and their experience with in-flight emergencies (n=805)

Characteristics	N (%)
Age, mean±SD	35.5±9.2
Sex	
Male	142 (17.6)
Female	663 (82.4)
Nationality	
Bahraini	645 (80.1)
Non-Bahraini	160 (19.9)
Profession	
Physician	290 (36.0)
Nurse	515 (64.0)
Setting of practice	
Primary healthcare centers	643 (79.9)
Government hospitals	162 (20.1)
Professional level	
Consultant/nurse supervisor	111 (13.8)
Senior healthcare worker (physician/nurse)	341 (42.4)
Junior healthcare worker (physician/nurse)	311 (38.6)
Chief healthcare worker (physician/nurse)	42 (5.2)
Years of experience (years)	
≤5	262 (32.5)
6–10	213 (26.5)
11–15	120 (14.9)
16–20	95 (11.8)
>20	115 (14.3)
Qualification	
Bachelors in nursing/medicine	482 (59.9)
Arab board or equivalent	203 (25.2)
Diploma in nursing	115 (14.3)
Doctor of philosophy (PhD)	5 (0.6)
Type of life support training*	
Basic life support	760 (94.4)
Advanced cardiac life support	283 (35.2)
Pediatric advanced life support	71 (8.8)
How frequently do you travel by airplane in a regular year?	
Never	35 (4.4)
Less than once a year, e.g., every 2 years	165 (20.5)
Once/year	369 (46.0)
2–3 times/year	201 (25.0)
>3 times/year	33 (4.1)
Have you ever received any training courses in managing IFE?	
Yes	65 (8.1)
No	740 (91.9)
Have you ever encountered any IFE?	
Yes	126 (15.7)
No	679 (84.3)
Which IFE have you encountered?	
Cardiovascular	58 (46.0)
Respiratory	20 (15.9)
Gastrointestinal	17 (13.5)
Anxiety disorders	13 (10.3)
Others**	18 (14.3)

Contd...

Table 1: Contd...

Characteristics	N (%)
Have you provided medical assistance during an IFE in an aircraft?	
Yes	90 (71.4)
No	36 (28.6)
In your opinion, training on an in-flight medical emergency has to be covered in which specialties?*	
All specialties	590 (73.3)
Emergency medicine	245 (30.4)
Family medicine	100 (12.4)
Obstetrics and gynecology	100 (12.4)
Pediatrics	91 (11.3)
Internal medicine	62 (7.7)

*Can select more than one option, **Allergy, obstetrics, fever, hypoglycemia, and seizure disorders. IFE=In-flight emergency, SD=Standard deviation

HCWs with more than 15 years of experience ($P = 0.001$) reported a higher willingness. HCWs with the following characteristics reported a higher confidence level: males ($P = 0.020$), noncitizens ($P < 0.001$), nurses ($P = 0.004$), working in a secondary care setting ($P = 0.001$), having worked for more than 15 years ($P = 0.020$), having had training in IFE ($P = 0.001$), and having encountered an IFE before ($P = 0.039$) [Table 5].

Logistic regression analysis showed that non-Bahraini healthcare professionals (odds ratio [OR] = 2.901, $P < 0.001$) had higher knowledge of IFE. In addition, nurses (OR = 1.642, $P = 0.047$) and healthcare professionals with longer years of experience significantly exhibited more willingness to assist in IFE. Non-Bahraini professionals ($P < 0.001$), professionals working in secondary care settings, those who had had training courses in the management of IFE, and professionals who had previously encountered an IFE were significantly more confident in assisting with in-flight emergencies than their counterparts [Table 6].

Discussion

This study aimed to assess the knowledge, willingness, and confidence of HCWs in Bahrain to assist with IFE. The results showed that most HCWs had low levels of knowledge and confidence in dealing with IFE, despite their high levels of willingness to assist in such situations.

The reported high willingness levels of HCWs to aid during IFE are in line with previous research findings.^[8,9] Even higher levels of willingness have been reported in some studies. The participants' fear of medicolegal issues was lower in this study than in other studies.^[8,9] The high level of willingness should be harnessed to enhance the confidence and knowledge of HCWs.^[14]

The low confidence level in managing on-board emergencies, as found in this study, is concerning. Many

Table 2: Willingness and self-confidence of healthcare professionals working in Bahrain in assisting with in-flight emergencies (n=805)

Statement	Strongly agree/ agree N (%)	Neutral N (%)	Disagree/strongly disagree N (%)
Willingness in assisting with IFE			
I would identify myself as a doctor/nurse and offer assistance in the event of an IFE	463 (57.5)	226 (28.1)	116 (14.4)
I would stay out of an IFE if someone else were already offering their assistance	242 (30.0)	242 (30.0)	321 (40.0)
I will not offer assistance if I am not familiar with the nature of the emergency, even though I am the only HCW onboard	161 (20.0)	211 (26.2)	433 (53.8)
I fear the medicolegal implications that may arise from my assistance with an IFE	262 (32.5)	266 (33.1)	277 (34.4)
Confidence in assisting with IFE			
I need more training in managing IFE	560 (69.6)	147 (18.2)	98 (12.2)
My medical training has given me adequate knowledge and skills to render assistance during an IFE	220 (27.3)	305 (37.9)	280 (34.8)
My medical training has given me adequate knowledge and skill to render assistance during a medical emergency on the ground level	367 (45.6)	246 (30.5)	192 (23.9)
I would currently feel confident responding to an IFE and providing competent care	243 (30.2)	337 (41.9)	225 (27.9)
I have an adequate understanding of what medical supplies are available on commercial airplanes	144 (17.9)	206 (25.6)	455 (56.5)
I have an adequate understanding of the level of training of commercial aircrew in managing IFE	144 (17.9)	212 (26.3)	449 (55.8)
I have an adequate understanding of how the aircrew, ground-based medical control, and the onboard volunteer HCWs collaborate to manage an IFE	146 (18.1)	231 (28.7)	428 (53.2)

IFE=In-flight emergency, HCW=Healthcare worker

Table 3: Knowledge of healthcare professionals working in Bahrain about in-flight emergencies (n=805)

Knowledge about in-flight emergency	Correct answer	N (%)
Cabin pressure leads to a decrease in systemic healthcare oxyhemoglobin saturation	True	370 (46.0)
The humidity in cabin air on a commercial flight is low when compared to typical ground-level	True	254 (31.6)
Commercial airplane cabins are typically pressurized to an altitude of sea level	False	90 (11.2)
Gas in body cavities can expand by 30 at low cabin pressure associated with cruising attitudes	True	174 (21.6)
Patients with acute exacerbation of asthma benefit from altitude restriction	True	188 (23.4)
Passengers with recent abdominal surgery are at risk of wound dehiscence or bowel perforation	True	333 (41.4)
Long-haul flights are associated with an increased risk of venous thromboembolism	True	482 (59.9)
The most common symptom of decompression sickness is confusion	False	93 (11.6)
Air travel is associated with an increased risk of preterm labor	False	131 (16.3)
Cardiac arrest is the most common IFE	False	135 (16.8)
Only a minority of IFE result in a diversion of the plane	True	242 (30.1)
Medical doctors, who are passengers, are obligated legally to respond to IFE	False	211 (26.2)
For flights on international airspace, the country where the aircraft is registered has legal authority on whether medical doctors are legally obligated to assist in IFE	True	196 (24.3)
Cabin crews are trained in BLS	True	527 (65.5)
Most airlines provide IFE service with ground-based physicians	True	269 (33.4)
The responding physician on board has the final say on whether the plane will be diverted because of an IFE	False	93 (11.6)
Equipment contents of an aircraft medical kit would typically include		
Sphygmomanometer	True	465 (57.8)
Intravenous catheters	True	430 (53.4)
Urinary catheter	True	178 (22.1)
Laryngoscope	False	57 (7.1)
Drug contents of an aircraft medical kit would typically include		
Epinephrine/adrenaline injectable	True	508 (63.1)
Dextrose 50 injectable	True	479 (59.5)
Oral aspirin	True	499 (62.0)
Anticonvulsant injectable	True	392 (48.7)

IFE=In-flight emergency, BLS=Basic life support

studies have reported comparable results.^[8-10] This low level of confidence in dealing with these emergencies can be attributed to the lack of knowledge and skills in managing IFE cases, diagnostic uncertainty, fear of

Table 4: Knowledge, overall willingness, and confidence levels of healthcare professionals in Bahrain regarding in-flight emergencies (n=805)

Levels of knowledge, willingness, and confidence	N (%)
Knowledge	
Low knowledge	711 (88.3)
High knowledge	94 (11.7)
Overall willingness	
Low willingness	329 (40.9)
High willingness	476 (59.1)
Confidence	
Low confidence	611 (75.9)
High confidence	194 (24.1)

medicolegal issues, and difficult settings. The association between the willingness and confidence of HCWs to help with in-flight emergencies has been reported in some studies.^[10,15]

In line with the reported literature, our study showed that knowledge of IFE was low.^[16] The revealed confidence and knowledge gaps underscore the need for targeted training programs designed to improve the skills and self-assurance of HCWs in this unique context.

In addition, most participants showed a poor understanding of the collaboration dynamics of the aircrew, ground-based medical control, and onboard HCWs. This knowledge deficit emphasizes the importance of improving communication and coordination among these stakeholders.^[17] Regarding familiarity with the contents of medical kits, the study found that the majority of participants correctly recognized items such as epinephrine/adrenaline injectables and oral aspirin. However, deficiencies emerged in the recognition of certain specific items, such as urinary catheters and laryngoscopes. This highlights the need for standardized equipment and clear guidelines governing the contents of medical kits on an aircraft in line with recommendations from Smith and Jones.^[14]

Notably, noncitizen HCWs displayed significantly higher knowledge scores than HCWs counterparts who were citizens, suggesting that cultural- and training-related factors could affect familiarity with IFE procedures. Cross-cultural variations in HCWs training and exposure to diverse patient populations contribute to these disparities as shown in some published studies.^[8-13] Moreover, some studies have reported that nurses demonstrated higher knowledge scores than physicians.^[18] This difference could be attributed to nurses' extensive training in patient care and their diverse experience in managing various medical scenarios, including IFE.

Professionals working in secondary care settings, individuals who had had training in IFE, and those with

prior experience in IFE were more confident in dealing with IFE cases. This further supports the positive impact of training programs on HCWs' level of confidence in managing IFE.^[19] However, the optimal duration and content of the training courses remain unclear.

Furthermore, nurses and HCWs with more than 15 years of experience exhibited significantly higher willingness levels, consistent with the systematic review of Smith *et al.*, in 2018.^[18] Accumulated experience enhances HCWs' confidence in addressing IFE, amplifying their willingness to respond. Some studies revealed an association between gender and confidence level, while other studies did not.^[20]

Collaboration among stakeholders, including aircrew, ground-based medical control, and onboard HCWs, should be strengthened through standardized protocols and procedures to ensure more effective responses. Standardizing the contents of IFE kits should be a priority for the aviation industry to ensure uniformity and familiarity for HCWs and in line with recommendations by Smith and Jones. The study's findings regarding differences between citizen and noncitizen HCWs underscore the importance of incorporating cross-cultural considerations into training programs. Therefore, interventions should be tailored by taking into account regional and cultural factors.

This study has several strengths. It is the first study to address the willingness, confidence, and knowledge of HCWs toward IFE in the country. A relatively substantial sample size was obtained of primary and secondary HCWs that included nurses as well as physicians. However, there are some limitations. Self-reported data carry the possibility of response bias since participants might provide socially desirable responses or overestimate their preparedness. Although the study delineated varied knowledge of different nationalities, it did not explore the cultural or regional factors that contributed to these disparities. While the study highlights the need for training, it does not provide specific recommendations for the content or structure of training programs.

Conclusion

In summary, this study revealed low levels of confidence and knowledge, but high willingness levels of HCWs in Bahrain to assist with IFE. As this study showed that most participants reported a lack of training on IFEs and a strong association between being trained on IFE and the level of confidence, targeted training and educational programs delivered by continuous medical education for HCWs in Bahrain are essential for the improvement of preparedness, confidence, and knowledge on IFE. Further studies are required to

Table 5: Association between characteristics of healthcare professionals in Bahrain and their knowledge, willingness, and confidence level in dealing with in-flight emergencies (n=805)

Sociodemographic factors	Knowledge level			Willingness level			Confidence level		
	Low N (%)	High N (%)	P-value	Low N (%)	High N (%)	P-value	Low N (%)	High N (%)	P-value
Sex									
Male	120 (84.5)	22 (15.5)	0.119	51 (35.9)	91 (64.1)	0.186	97 (68.3)	45 (31.7)	0.020
Female	591 (89.1)	72 (10.9)		278 (41.9)	385 (58.1)		514 (77.5)	149 (22.5)	
Nationality									
Citizen HCWs	587 (91.0)	58 (9.0)	<0.001	273 (42.3)	372 (57.7)	0.092	525 (81.4)	120 (18.6)	<0.001
Noncitizen	124 (77.5)	36 (22.5)		56 (35.0)	104 (65.0)		86 (53.8)	74 (46.3)	
Profession									
Physician	268 (92.4)	22 (7.6)	0.007	150 (51.7)	140 (48.3)	<0.001	237 (81.7)	53 (18.3)	0.004
Nurse	443 (86.0)	72 (14.0)		179 (34.8)	336 (65.2)		374 (72.6)	141 (27.4)	
Setting of practice									
Primary setting	573 (89.1)	70 (10.9)	0.164	269 (41.8)	374 (58.2)	0.267	505 (78.5)	138 (21.5)	<0.001
Secondary setting	138 (85.2)	24 (14.8)		60 (37.0)	102 (63.0)		106 (65.4)	56 (34.6)	
Professional level									
Consultant/supervisor	105 (94.6)	6 (5.4)	0.084	38 (34.2)	73 (65.8)	0.089	90 (81.1)	21 (18.9)	0.468
Senior healthcare worker	295 (86.5)	46 (13.5)		130 (38.1)	211 (61.9)		252 (73.9)	89 (26.1)	
Junior healthcare worker	272 (87.5)	39 (12.5)		143 (46.0)	168 (54.0)		238 (76.5)	73 (23.5)	
Chief HCW	39 (92.9)	3 (7.1)		18 (42.9)	24 (57.1)		31 (73.8)	11 (26.2)	
Qualification									
BSC in nursing/medicine	426 (88.4)	56 (11.6)	0.006	182 (37.8)	300 (62.2)	<0.001	372 (77.2)	110 (22.8)	<0.001
Arab board or equivalent	188 (92.6)	15 (7.4)		108 (53.2)	95 (46.8)		169 (83.3)	34 (16.7)	
Diploma in nursing	94 (81.7)	21 (18.3)		38 (33.0)	77 (67.0)		68 (59.1)	47 (40.9)	
PHD	3 (60.0)	2 (40.0)		1 (20.0)	4 (80.0)		2 (40.0)	3 (60.0)	
Years of experience									
<5	235 (89.7)	27 (10.3)	0.479	121 (46.2)	141 (53.8)	0.001	215 (82.1)	47 (17.9)	0.020
6–10	192 (90.1)	21 (9.9)		98 (46.0)	115 (54.0)		164 (77.0)	49 (23.0)	
11–15	105 (87.5)	15 (12.5)		49 (40.8)	71 (59.2)		84 (70.0)	36 (30.0)	
16–20	82 (86.3)	13 (13.7)		25 (26.3)	70 (73.7)		65 (68.4)	30 (31.6)	
>20	97 (84.3)	18 (15.7)		36 (31.3)	79 (68.7)		83 (72.2)	32 (27.8)	
Training courses in in-flight emergencies									
Yes	54 (83.1)	11 (16.9)	0.170	26 (40.0)	39 (60.0)	0.882	38 (58.5)	27 (41.5)	0.001
No	657 (88.8)	83 (11.2)		303 (40.9)	437 (59.1)		573 (77.4)	167 (22.6)	
BLS									
Yes	671 (88.3)	89 (11.7)	0.903	306 (40.3)	454 (59.7)	0.150	578 (76.1)	182 (23.9)	0.679
No	40 (88.9)	5 (11.1)		23 (51.1)	22 (48.9)		33 (73.3)	12 (26.7)	
ACLS									
Yes	253 (89.4)	30 (10.6)	0.484	124 (43.8)	159 (56.2)	0.210	223 (78.8)	60 (21.2)	0.157
No	458 (87.7)	64 (12.3)		205 (39.3)	317 (60.7)		388 (74.3)	134 (25.7)	
PALS									
Yes	64 (90.1)	7 (9.9)	0.617	27 (38.0)	44 (62.0)	0.610	53 (74.6)	18 (25.4)	0.796
No	647 (88.1)	87 (11.9)		302 (41.1)	432 (58.9)		558 (76.0)	176 (24.0)	
Encountered any IFE?									
Yes	107 (87.0)	16 (13.0)	0.595	45 (36.6)	78 (63.4)	0.290	84 (68.3)	39 (31.7)	0.039
No	602 (88.7)	77 (11.3)		283 (41.7)	396 (58.3)		525 (77.3)	154 (22.7)	

BLS=Basic Life Support, PALS=Pediatric advanced life support, ACLS=Advanced coronary life support, IFE=In-flight emergency, HCW=Healthcare worker

determine the causes of the differences and deficiencies in the willingness, confidence, and knowledge of professionals of different nationalities and specialties on IFE.

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Conflicts of interest

There are no conflicts of interest.

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Table 6: Logistic regression analysis: Correlates of knowledge, willingness, and confidence in assisting with in-flight emergency among healthcare professionals in Bahrain (n=805)

Variable	OR (95% CI)	P-value
Knowledge about IFE		
Nationality - reference: Bahraini	2.901 (1.577–5.334)	0.001
Profession - reference: Physicians	0.506 (0.199–1.289)	0.153
Qualifications - reference: BSC in nursing/medicine	0.179 (0.022–1.420)	0.103
Qualifications - reference: BSC in nursing/medicine	0.226 (0.032–1.594)	0.136
Qualifications - reference: BSC in nursing/medicine	0.130 (0.016–1.087)	0.060
Willingness to assist in IFE		
Profession - reference: Physicians	1.642 (1.007–2.677)	0.047
Qualification - reference: BSC in nursing/medicine	1.725 (0.178–16.734)	0.638
Qualification - reference: BSC in nursing/medicine	2.742 (0.295–25.489)	0.375
Qualification -reference: BSC in nursing/medicine	2.567 (0.259–25.446)	0.420
Years of experience - reference: <5 years	2.479 (1.474–4.169)	0.001
Years of experience - reference: <5 years	2.094 (1.259–3.483)	0.004
Years of experience - reference: <5 years	1.826 (1.047–3.182)	0.034
Years of experience - reference: <5 years	0.812 (0.438–1.507)	0.509
Confidence in assisting in IFE		
Sex - reference: Female	0.681 (0.442–1.050)	0.082
Nationality - reference: Bahrain	3.249 (2.038–5.178)	<0.001
Profession - reference: Physicians	1.501 (0.989–2.278)	0.056
Setting of practice - reference: Primary care	1.619 (1.075–2.438)	0.021
Years of experience - reference: <5 years	0.996 (0.561–1.768)	0.988
Years of experience - reference: <5 years	0.810 (0.461–1.424)	0.465
Years of experience - reference: <5 years	0.919 (0.496–1.703)	0.788
Years of experience - reference: <5 years	0.987 (0.515–1.891)	0.968
Received training courses in managing IFE? - reference: No training	2.247 (1.287–3.923)	0.004
Encountered any in-flight medical emergency before? - reference: No previous encounter to IFE	1.974 (1.210–3.221)	0.006

IFE=In-flight emergency, CI=Confidence interval, OR=Odds ratio

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