

Forensic, medical and legal problems and solutions on passenger and cargo ships

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Abstract

Marine vehicles have an important place in international trade and tourism. There are various directives and studies on the prevention of health problems in marine vessels and injuries and deaths due to occupational accidents. In the literature, not enough studies have been found in which the issues to be considered in cases of injuries, sexual assaults, accidents, suicides and murders that are common in forensic medicine practice, and there are no guidelines or recommendations of internationally accepted organizations. It is important to determine the seafarer who is responsible for intervening in health emergencies on cargo ships, and to detect faulty ones, if any, in work accidents that result in serious injury and death. In addition, injuries, suicides and murders are encountered among the crew, and crime scene findings are lost until they are evaluated by the judicial authorities. Although rare, sexual assaults on cargo ships are also reported, but there are not enough scientific studies that indicate what should be done in terms of evidence evaluation. Our study emphasizes the issues to be considered, that one of the crew should be held responsible and necessary training should be given in order to make a forensic medical evaluation in forensic events that will be encountered on cargo ships, and that physicians and health workers should be competent in the first forensic medical evaluation in case of emergency on passenger ships. It is thought that the launch of the telemedicine application, which provides uninterrupted service for forensic medical emergencies in maritime vessels, under the leadership of organizations such as the "International Maritime Organization" (IMO), will make a significant contribution. In addition, suggestions are made for legal impasses in such cases that take place in high seas.

Keywords: Telemedicine, ships, sexual offenses, criminology, forensic medicine

Citation: Kayhan U, Liman Z, Tabanlı F. Forensic, medical and legal problems and solutions on passenger and cargo ships. Health Sci Q. 2024;4(2):101-12. <https://doi.org/10.26900/hsq.2259>

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Introduction

There are many different types of vehicles at sea. These can be classified as cargo ships engaged in cargo transportation, cruise ships used in maritime tourism and long-distance passenger transportation, ferries used for short-distance passenger transportation, warships used in war and military operations, and boats, vessels and medium-sized commercial vessels that are used for fishing activities [1]. Ship size and number of seafarers can be independent of the type of ship. However, cruise type passenger ships have doctors, nurses and health officers on board due to the number of passengers and the time spent away from the shore [2,3]. Nurses or health officers are considered sufficient for cargo-freight carrying ships since the number of employees does not warrant the employment of a physician [4].

Health care on board ships varies according to the size and type of ship. Large ships, such as cruise ships or military vessels can be equipped with a medical center with trained medical personnel on board [5]. Smaller vessels have more limited medical facilities and personnel, or crew members with basic first aid training are assigned to provide medical care [6]. This person is usually a paramedic, nurse or doctor with specialized training in emergency and maritime medicine. They are also responsible for maintaining medical equipment and supplies, coordinating with other health professionals ashore and ensuring medical evacuation in serious emergencies [7].

According to the "Seafarers and Pilots Regulation" [8] which entered into force in Türkiye on February 10, 2018, all seafarers must receive basic first aid training, and first officers and masters must receive medical care training. In addition, a free of charge health hotline service for seafarers and passengers is available under the structure of the General Directorate of Health of Turkish Borders and Coasts under the Ministry of Health. Uninterrupted telehealth consultancy services provided by physicians and other specialized health teams are among the leading services offered. This service is provided to Turkish and foreign-flagged vessels both on

the Turkish coastline and in international waters [9]. The provided services are mainly within the scope of preventive health services and information about immunization [10]. If a death has occurred after a forensic incident or if the cause of death has not been determined, judicial institutions are informed and the judicial process is initiated. In the European Union, works are carried out to develop preventive health systems with pilot applications in maritime transportation [11,12]. Occupational health and safety measures are at the heart of preventive health measures [13].

Health Practices on Passenger and Cargo Ships

The practice of medicine on board cruise ships is designed to ensure that passengers and crew members have timely access to quality medical services in the event of illness and injury so that they can continue with the rest of their voyage. Each cruise ship should have a medical center as well as medical staff according to the size of the ship. The intended purpose of medical personnel on board is to provide "reasonable" emergency medical care. In practice, this "reasonable" emergency care means stabilizing the sick or injured passenger until treatment on land is possible [14].

Passenger injuries significantly increase the workload of the medical team on board. A well-equipped, competent medical staff will effectively treat the majority of injuries on board, thereby reducing the number of costly and inconvenient helicopter evacuations, route diversions, port transfers and disembarkations [15]. In a study examining the medical practice of cruise ships, the data generated by one doctor and two nurses with an average of 464 passengers (51% female) and 615 crew members (22% female) during a 106-day cruise from Los Angeles to New York was recorded continuously and reviewed after the cruise [15]. The results turned out to be quite striking. There were 4,244 registered patient contacts (40 per/day), of which 2,866 directly involved the physician (27 per day). 59% of physician's examinations were performed on passengers, and 59% of nurse examinations were performed on crew members. The most common reason for consultation was respiratory illness

in passengers (19%) and skin diseases in crew (27%). Various injuries were the most common type (passengers 41% and crew 40%) among 101 reported cases (56 passengers, 45 crew). The most common accident sites for passengers were ashore (27%) and on crew galleys (31%). Seven passengers and 13 crew members were referred to dentists ashore, five passengers and two crew members were referred to medical specialists ashore and returned to the ship while seven passengers and one crew member were hospitalized in a port. The following conclusion was reached: health personnel have a heavy workload during long voyages. According to the findings of the Dahl's study in 2005; experience in emergency and general medicine, good communication skills and cruise experience are useful qualifications for medical personnel [2].

While various standards are determined for the medical facilities and personnel of many passenger ships, the standards set for cargo ships and tankers is more limited [16]. Although there is an international medical guide for ships, no international guide has been found regarding forensic medical issues. There is also no standardized training for cruise ship doctors [17]. The "Health Care Guidelines for Cruise Ship Medical Facilities" [18] issued by the "American College of Emergency Physicians" (ACEP) recommends that cruise ships be equipped with oxygen, cardiac defibrillators, external pacemakers, ECGs, x-ray machines, stretchers, wheelchairs, immobilization equipment, sutures, medications and bandages. There should be at least one inpatient bed and intensive care unit for 1000 passengers and crew, and at least one isolation room or the means to isolate patients. In the case of more serious cases, such as heart attacks and strokes, ACEP guidelines recommend that the ship should either proceed to the nearest port or the patient be airlifted from the ship.

Medical assistance to the sick or injured on the high seas is always a problem. However, means of communication with the shore have improved considerably. Simultaneous information can be shared with doctors ashore, but in the event of a serious medical situation, the crew is helpless as they are not competent to follow instructions. In such cases, evacuation vehicles and the distance

from the port with medical facilities plays an important role [19].

Approach to Forensic Medical Cases on Passenger and Cargo Ships

a. From a Forensic Medical Perspective

Sea voyages have a high level of risk compared to land activities [20]. The extended time spent on the sea causes difficulties in accessing health services. The evacuation process itself when necessary also carries significant risks [21]. The incidence and frequency of some health problems, especially cardiovascular diseases, have been found to be higher in seafarers compared to the normal population as a result of less than perfect living standards, working conditions and stress [22,23]. The risk of occupational accidents encountered at sea was found to be 11 times higher than on land [24]. Injuries and fatalities are encountered on board ships for different reasons. A study carried out between 2000 and 2019 on passenger and crew fatalities on board cruise ships, falling from the deck or onto the lower deck, cardiac events, suicides and homicide were reported as the main causes of death [25]. Similar to cruise ships, main causes of fatal work-related injuries on cargo ships are cited as poor weather conditions, inadequate safety awareness, failure to use personal protective equipment and inexperience. Most fatal occupational accidents occur among deckhands and deck officers and similar types of accidents such as falling into cargo holds and falling overboard. Fatal injuries during off-duty hours are often associated with alcohol consumption. International Maritime Organization (IMO) statistics reveal that 80% of accidents on cargo ships are caused by human factors [26]. Injuries to ship workers are reported as occupational accidents due to the working environment. One study reported that 5% of occupational accidents resulted in death and permanent disability [27]. Work accidents occur at different rates in different occupational groups, and foreign workers are more likely to be injured than local workers [27,28]. Accidents among passengers vary depending on factors such as travel time, passenger gender, age and the number of passengers, and the rate of serious injuries in reported accidents is revealed to be

around 12% [15]. A 25-year study reported that fatalities occurred in 1.3% of treated patients with circulatory system disorders topping the list [21,29]. Another study revealed that fatalities were more common on passenger ships than on cargo ships and that the age and number of passengers were effective in this result and that fatal accidents increased in adverse weather conditions and at night [30]. Studies on homicide and suicide rates in death cases in the literature are insufficient. Apart from accidents and occupational accidents, forensic cases on ships can also be classified as injury, killing, poisoning and sexual abuse. All of these cases are evaluated within the scope of offences against physical integrity. One study reported that 33% of deaths on board were due to poisoning, one quarter of which were self-inflicted, while 24% were homicides. Another study from 2014 revealed that 74% of the 66 cases of death on board ships were classified as accidents, 1% as suicide and 11% as disappearing in water [31]. The rate of suicide in seafarers is higher than in other segments of society. A study on the mental health of seafarers emphasized that 11% of total seafarer deaths were due to suicide, and that this rate could be higher when the possibility of suicide is considered in cases of falling into the water or being lost in the water [32]. Social opportunities, working and living conditions increase the rate of drug and alcohol use among workers, which in turn increases the likelihood of criminal incidents. The rate of alcohol intake involved in on-deck accidents is considered to be one of the important factors that increase the risk of accidents. Although women are working in many areas of life at similar rates to men, seafaring is still considered a male profession. Studies indicate that 2% of ship employees are women, and that female employees are often employed in the entertainment sector of cruise ships [33]. Although the number of women is low, the incidence of sexual harassment is reported to be higher than such harassment on land. One study reported that 17% of female seafarers were exposed to sexual harassment while another study reported that half of them were exposed to such harassment [33,34]. In one study, the incidence of sexual harassment on board ships was reported to be 50% higher than

the average incidence of sexual harassment in the USA [35]. The reason for the lack of sufficient studies on sexual harassment on cargo ships is explained as the low number of female seafarers on such ships. However, considering that sexual harassment does not only target the opposite sex, sexual assault by male workers against each other on cargo ships emerge as another issue to be considered. The available protection and prevention efforts regarding sexual assaults are not enough to prevent such assaults. Sexual assault cases are frequently reported incidents. Sexual assault cases need to be managed quickly and correctly to identify the perpetrator. In sexual assault cases, it is important to carry out an examination as soon as possible and obtain material evidence from the victim. This evidence can be listed as body fluids, hair tissue of the suspect as well as ecchymosis, abrasion, bleeding, vaginal or anal trauma findings on the victim's body which are considered as sexual assault findings. After these findings are collected, they should be evidenced by taking photographs and video recordings in the correct light and from the right angle to enable experts to make the correct assessment [36]. The first thing to be done to determine a crime and the perpetrator in forensic incidents encountered on board a ship is to inform the captain in charge and to report the incident in the early period [28]. Crime scene investigation teams and forensic officers can be called to collect and analyze evidence from the ship and the scene. Many physical, chemical and biological evidences are collected from the scene. DNA samples and fingerprints are commonly used among these evidences. With the reflection of technology in recent years, video recordings also make an important contribution to incident or crime scene investigation [37]. The most important step in crime scene investigation is the prevention of deterioration-contamination that can have an adverse impact on the evaluation. Therefore, the presence of untrained persons at the crime scene can prevent the collection of evidence and also cause false positive findings belonging to people who are not involved in the incident. The fact that the crime scene in question is a ship is an obstacle to a fast, effective and accurate crime scene investigation. When all these facts are taken into consideration, the

necessity of trained personnel in charge of crime scene investigation and evidence collection, as well as responsible for first aid and health intervention on board to deal with forensic incidents emerges. It is not only important to obtain evidence from the right sources in the right way, but also to store it in the right way.

b. From a Legal Perspective

1. Jurisdiction over maritime zones

Treaties and generally accepted principles of international law establish the right of a State to assert jurisdiction over crimes committed at sea. The United Nations Convention on the Law of the Sea (UNCLOS) [38,39] constitutes the main source of international law determining jurisdiction over maritime zones. In this context, it is not possible for a coastal state to establish rules that include rights and powers that are not defined in the UNCLOS [40].

Different powers are exercised in different maritime zones. The territorial sea is regulated in Article 2/1 of UNCLOS as a maritime zone under the sovereignty of the coastal state. The coastal state has the authority to make all the regulations required by its territorial sovereignty in its territorial waters. When a passenger ship navigates in the territorial waters of a coastal State, the coastal and flag States have concurrent jurisdiction over the ship. However, when foreign flagged ships are in the territorial waters of a coastal State, they must comply with the laws of the coastal State [19]. Although a passenger ship is subject to the laws of the coastal state when it is in the territorial waters of another state, the coastal state's jurisdiction to exercise criminal jurisdiction over the passenger ship is limited (Article 27 UNCLOS). Nor does the coastal State have the right to stop a foreign ship passing through its territorial waters to exercise civil jurisdiction over a person on board. A coastal state can exercise jurisdiction over ships in certain circumstances in the exclusive economic zone (EEZ) and the contiguous zone. The EEZ grants a coastal state sovereign rights to explore, exploit, protect and manage living and non-living resources. A coastal state has jurisdiction only over artificial structures, marine scientific research and matters relating to the marine

environment (Article 56 UNCLOS). A coastal State has the authority to prevent and punish violations of its customs, fiscal, immigration or health laws and regulations within its territory or territorial waters in a contiguous zone (Article 33 UNCLOS). Furthermore, the adopted international legal framework does not support the introduction of mandatory reporting requirements by coastal States for illegal acts committed by foreign-flagged vessels outside their territorial jurisdiction [41]. The high seas are open to all states, coastal and non-coastal. No state can claim sovereignty over any part of the high seas. However, the absence of sovereignty does not mean the absence of authority. As stated in Article 92 of UNCLOS, a passenger ship is subject to the exclusive jurisdiction of the flag State on the high seas. Therefore, in the territorial waters of other states, the flag state's jurisdiction over the ship is concurrent with the coastal state's jurisdiction, but on the high seas the flag state has traditionally been recognized as having exclusive jurisdiction [42]. When a crime occurs on the high seas, i.e. on ships sailing in international waters, the regulations applicable to these crimes are complex and applicable sanctions can be limited. For example, the International Maritime Organization (IMO) [43] which is the leading regulator of the maritime sector, does not directly monitor the compliance of member states with safety, pollution, search and survey standards. Likewise, jurisdictions in the criminal context are complex and as a result, a criminal act committed on board a cruise ship often results in competing jurisdictional claims. Under UNCLOS, the flag State in which a ship is registered has the primary responsibility to report, investigate and prosecute crimes committed on board (Article 94 UNCLOS). However, a state can invoke criminal jurisdiction if the offense is committed in its territorial waters, has a detrimental effect on national security, involves one of its nationals, or the criminal conduct is widely condemned (e.g., genocide or hostage-taking) [44]. In the event of a collision on the high seas which gives rise to criminal or disciplinary liability of the master or any other person in the service of the ship, or in any other incident relating to the sea navigation, criminal or disciplinary proceedings can be instituted

against such persons only under the auspices of the judicial or administrative authorities of either the State whose flag the ship flies or the State of nationality of such persons (Article 97 UNCLOS). For example, if a ship is attacked on the high seas, which state can assert jurisdiction over the perpetrator? As regulated in UNCLOS, the state whose flag the ship flies can assert jurisdiction. The flag is commensurate with the sovereignty of that state. However, let us assume that the flag State has no interest in participating in an investigation or prosecuting the incident. The offense will not be investigated if there is no bilateral agreement with the victim's state of nationality or if the victim's state of nationality does not deal with the incident or insisted that it is handled by the flag state. In fact, there have even been some cases where the cruise ship company has removed the perpetrator from the ship to avoid any investigation by the passenger's state of nationality [14].

2. Various liability situations on passenger ships

Traveling by ship (cruise tourism) is an important and growing sector of international tourism. Around 30 million passengers travel each year with the global cruise industry [45]. The special relationship between a carrier and its passengers involves a person entrusting themselves to the protection and care of another. Passenger ships have a duty to provide safe transport and protect passengers from harm at the hands of the ship's crew. The relationship between the passenger and the cruise ship is contractual through the sale of the ticket and establishes an implicit obligation on the part of the carrier to protect passengers against attacks or mistreatment by its officers. The rape, indecent assault or harassment of a passenger by the crew is a breach of the carrier's duty to carry the passenger safely and protect the passenger from harm. While it is clear that the carrier has breached its duty in the occurrence of situations such as rape, there is uncertainty as to whether the legal standard of care for the shipowner's duty in the proceedings is strict liability or negligence (fault-based liability) [46]. Carriers have an obligation to control the behavior of third parties that can harm passengers. In relation to such actions, carriers are held liable for the tortious acts of

their employees against passengers under the super addressee theory [46]. The passenger ticket contains a number of almost invisible clauses, most of which remove liability for various problems that can arise during the cruise [47]. Examples from publicly available official documents used by cruise lines shed little light on the duty of care owed to victims of crime. For example, the Royal Caribbean International Passenger Ticket Contract absolves the company of liability by stating that "*The passenger understands and agrees that the carrier has a zero tolerance policy towards illegal activities and will report such activities to the appropriate authorities*". Likewise, Royal Caribbean's "liability" clauses do not mention crime, illegal activities or victims. While there are differences in the content of passenger contracts between different cruise lines, they are full of legalese and written in a way that can confuse the average person. The situation is so complex that a passenger booking a cruise can quite understandably have little or no idea what the terms of travel actually are or even with whom they are making a contract. However, by purchasing a ticket and boarding a cruise ship, passengers agree to the terms, conditions and obligations (or lack thereof) set out in these documents [44]. When a crime occurs on board cruise ships, there are a number of significant obstacles to reporting the crime, including the gravity of the crime, liability and complex government discretion arising from international legislation, the existence of profit-oriented regulations in the cruise industry, and lack of research [44]. Cruise lines offer a range of shore excursions for their passengers to enjoy various ports and generate revenue for the cruise lines. Some shore excursions are organized by the cruise lines themselves or by companies set up by the cruise lines to operate them. More often, however, external companies contract with cruise lines to offer their excursions to passengers, with the cruise lines receiving a portion of the cost of each excursion. The relationship between cruise ships and these external companies can be presented through verbal material provided to passengers, with the excursion ticket and the contract of passage ticket. The way in which the relationship is presented to passengers is crucial in determining

liability for personal injury to the passenger [48]. The negligence of employees and/or agents of an independent contractor does not impose liability on the shipowner. Therefore, the passenger has to prove the negligence claim. This requires the existence of a duty owed by the shipowner or operator, a breach of duty and negligence and a close causal link, injury and damage. Courts have generally accepted disclaimers that the operator of a passenger ship is immune from the negligence of an independent contractor. It is easy to see from the contracts that the cruise line is exempt from claims for personal injury/death, loss or delay, as well as any property loss or damage caused by the negligence or breach of any person. It can be assumed that the aim of this general clause is to discourage passengers who have been victimized from filing a lawsuit [14]. Most cruise ships today employ a doctor, a nurse or both. In the absence of medical personnel, a ship would have to divert to the nearest port in the event of a medical emergency. But what about the shipowner's liability to the passenger if something goes wrong in the medical treatment of a passenger on board or if malpractice by the ship's doctor or medical staff occurs? It is generally accepted that the shipowner will not be vicariously liable for the negligence of a ship's doctor hired after a reasonable inquiry into his qualifications and competence. It does not matter if the doctor is considered a member of the crew. This rule is extended to the ship's medical staff working under the supervision of a doctor [48].

3. Crimes committed on cruise ships

According to compilations of reported crime statistics, the most common incidents include homicide, suspicious death, missing citizens, kidnapping, serious bodily harm, assault, theft over \$10,000, and sexual assault [14]. Sexual assault is more frequently reported than any other crime on board ships. Sexual assaults on board can occur between passengers and crew as well as between the passengers themselves [40,49]. The cruise ship setup facilitates the occurrence of sexual assault. As is true for almost all types of tourism venues, passengers are in a more relaxed state of mind and less aware of their surroundings. With cameras on board, passengers have higher expectations

of safety than on land. Alcohol is plentiful and since driving is not a problem, safe drinking limits are often exceeded. Drug use is also often a facilitating factor in sexual offenses [48,49]. Room attendants, waiters, waitresses, bartenders, musicians, security guards, casino workers, galley workers and others on board are reported to have committed these crimes. The most common places where these crimes occur include the crew cabin/crew area, bars, dining rooms, spas, corridors, decks, public areas, disco, public bathrooms, elevators, pools, beach, and often passenger cabins [14]. These crimes are largely unreported by the cruise industry to avoid losing potential customers [14]. It seems that serious crimes are committed on board cruise ships, or that truly accurate records of criminal incidents are not disseminated by cruise ships, or that initial post-incident investigations are often conducted by cruise ships. As these investigations are conducted through onboard security personnel, risk management personnel and often through the cruise ships' lawyers, they are more interested in saving the cruise line from legal liability than in preserving or finding evidence of a crime. They therefore do not have an impartial relationship with the cruise ship and the fear of litigation against their employer can lead to a compromised investigation [41]. It is also noted that those seeking information from cruise ships face significant difficulties. Even in cases where victims file a lawsuit, cruise ships are not forthcoming in sharing the necessary information until ordered to do so by the court [41]. It is important that the victims of any crime take action themselves to preserve and collect evidence from the crime scene as much as possible. There are a number of recommendations to combat crimes on board ships. First, personnel tasked with responding to a crime and interacting with victims should receive more specialized training to understand the experiences and needs of victims and minimize secondary victimization. In addition, all staff should receive training to be able to assist the victim in some capacity. Secondly, the inclusion of independent staff on board cruise ships to act in the capacity of an ombudsman outside the hierarchical structure of the cruise industry would help to improve the initial

response to crime. The presence of a “stranger” on board during the voyage will reduce the possibility of distorting the true nature and occurrence of the crime. Finally, a revamped reporting system should be implemented, including reporting of all crimes (not just those that meet arbitrary thresholds), making data publicly available, and clarity on reporting and recording responsibilities. This will enable comprehensive quantitative research that should be complemented by qualitative research on experiences of crime and victimization that can be tracked over time to promote crime prevention and reduction [44]. When a ship navigates in the territorial waters of a coastal state, the coastal and flag states have concurrent jurisdiction over the ship, but as stated in Article 27 of UNCLOS, when a ship is navigating through the territorial waters of another state, it is subject to the laws of the coastal state, but the coastal state’s ability to exercise criminal jurisdiction over the ship remains limited. There is no generally accepted legal text or directive on how to conduct an assessment in the event of a death associated with a forensic cause. When a judicial incident occurs on the high seas, i.e. on board ships sailing in international waters, the procedure to be applied to these incidents and the procedure to be followed in cases of death is not clearly known. Criminal or disciplinary proceedings against the master or any other person in the service of a ship in an incident giving rise to criminal or disciplinary liability in international waters can be instituted against such persons only before the judicial or administrative authorities of either the State whose flag the ship flies or the State of nationality of such persons (Article 97 UNCLOS).

c. Solutions to Medical and Legal Problems Encountered on Ships

1. What to do in Injury Cases

Injuries on marine vessels can occur from many different origins. Occupational accidents, interpersonal violation of physical integrity or in-vehicle accidents are some of them. In cases where physical integrity is violated, the injury can be caused by a blunt instrument or with the help of tools such as knives, guns,

etc. After first aid has been administered to the injured person, the shape of the wound shape, its dimensions (width, length and depth) should be photographed and videotaped, if possible with the help of a scale (such as a coin or ruler). In addition, security camera footage, which is material evidence for a criminal case, should also be recorded and stored. Injuries can also occur due to in-vehicle accidents. In such injuries, considering the severity of the injury and the possibility of legal problems regarding fault, the findings of the injury should be photographed and videotaped with the help of a scale (such as a coin or ruler), if possible, and the security camera records of the incident should be kept, if any. Another cause of injuries on board a vessel are occupational accidents. Although IMO guidelines are available for these accidents, injury findings should also be documented for legal liability afterwards, witness statements and video recordings, if any, should be kept.

2. What to do in Death Cases

In the case of death on board a seagoing vessel, it is very important to distinguish whether the death was a natural death or a forced death. In cruise-type passenger ships where a physician works on board, the diagnosis of death can be made by a classical examination of the deceased by the physician. However, in suspicious cases where the cause of death cannot be determined, in cases of death due to forensic reasons and allegations such as possible differences in the cause of death, it would be more appropriate that a forensic death examination is performed on the deceased by forensic medicine specialists. In such cases, in addition to body evacuation, forensic necropsy at the scene by the judiciary, law enforcement and experts will make an important contribution to the forensic process. In case a physician is not available, the body should be evacuated to land as soon as possible. However, if a death occurs on a ship that cannot interrupt its route and in international waters, such as dry cargo ships, the death examination of the corpse and crime scene investigation cannot be performed immediately. In such cases, detailed photographs and video recordings of the corpse should be taken as a whole and as described in the topic “What to Do in Injury Cases”, and if there are traumatic

findings, a scale (such as a coin or ruler) should be used to assess the size of the injury. Security camera records of the time and place of death should be kept. The clothes of the deceased should be removed without damaging them and stored in a cardboard box. If the clothes are wet, they should be dried in the sun and then stored. If the body cannot be evacuated, it is important to keep the body in a refrigerated section until disembarkation, considering that all findings will be lost as a result of decomposition.

3. What to do in Case of Sexual Assault

In cases of sexual assault, the first thing to do is to take the victim to a safe environment and fulfill their needs. This means addressing the physical and psychological needs of the victim, which requires professional assistance.

Due to the duration and means of sea voyages, ships do not have the possibility to change their routes. Therefore, waiting for a physical evaluation by an expert after an allegation of sexual assault on board has been made means the loss of evidence that could be detected after the incident. The steps to be taken to protect the evidence after the first aid in sexual assaults with the guidance of experts can be listed as follows;

- The clothes of the victim of sexual assault worn at the time of the incident should be taken and kept in a cardboard box in a non-humid environment, if wet, they should be kept after drying in the sun.
- Numerous photographs should be taken in a brightly lit environment of the body parts where contact is alleged to have taken place in the sexual assault as a whole and in detail and from different angles, and video recordings should be taken as far as possible, and internationally recognizable materials (coins, rulers, etc.) should be used for scaling general body photographs.
- Samples should be taken with a swab from areas where the suspect's body fluids (such as saliva, ejaculate) can be transmitted.
- The swabs should be taken separately and the relevant areas where they are taken from must be written down.
- The specimens should be stored in a cold and non-humid protected place.

4. Expanding the Use of Tele-Health

One of the solution proposals for forensic medical situations that are likely to occur at sea is to have a Forensic Medical Telehealth Application that can receive help and support in forensic medical situations, even if there is a physician or other healthcare professionals on board. Telemedicine, also known as telehealth, is called the arranging treatment from a ship to a hospital anywhere in the world through satellite connections, which has been used more and more with the COVID-19 Pandemic [17]. It is considered to be a very necessary practice for ship passengers and employees due to the time away from the shore and the limited access to quality health services. The advanced development of current technology and the availability of internet connections and technical infrastructure on every ship is the most important issue that will facilitate the implementation. The number of studies on forensic medical events encountered in marine vessels in the literature is insufficient. Considering the increase in international trade and costs, the use of ships, which are the most frequently used means of transfer, is increasing. In addition to the increase in cargo ships, there is also an increase in the number of passenger ships and passengers. When all these issues are evaluated together, scientific studies on forensic medical and legal problems encountered on board ships will provide guidance to responsible institutions.

5. Recommendations from a Legal Perspective

Although there is no uniform international standard of medical care on passenger ships and no standard training requirement for passenger ship doctors, the preparation of a guideline, for example, under the leadership of the IMO, would play an important role in complying with the accepted standards. The guidelines issued by the American Board of Emergency Physicians are an important example in this context. There are certain directives on first aid and the occupational health of employees in marine vessels issued by IMO. These guidelines are updated from time to time and meet the needs to a certain extent. However, there are not enough guidelines or training on medical issues other than first aid and especially forensic medical issues. The fact

that the ship's flag belongs to different states, the ship's location on the coast of different states or the lack of a standard approach to be followed in forensic cases in international waters causes legal deadlocks. The relevant regulations need to be updated to provide solutions to such legal problems. Coastal States are not obliged to report illegal acts committed by foreign flagged vessels outside their territorial jurisdiction. Bilateral or multilateral agreements can be concluded to increase cooperation between states on this issue. However, coastal states have rescue obligations. According to Article 98 of the UNCLOS; every coastal State shall promote the establishment, operation and maintenance of an adequate and effective search and rescue service regarding safety on and over the sea and, where circumstances so require, by way of mutual regional arrangements cooperate with neighbouring States for this purpose. Another legal suggestion is to eliminate the legal confusion in cases of injury, murder or sexual assault in international waters. To illustrate the issue with an example; if a Filipino worker on a Turkish-flagged ship is killed by another worker of Egyptian nationality while the ship is sailing in international waters, it is not clear which country's legal system will prevail over the trial. In such cases, internationally recognized decisions in the field of the Law of the Sea should be taken and uncertainties should be eliminated. In terms of telehealth practice, it will be important to establish guidelines that will be generally accepted by organizations such as IMO and to provide a standard telehealth service to ships both in international waters and within the coastlines of states. In terms of telehealth practice, it will be important to establish guidelines that will be generally accepted by organizations such as IMO and to provide a standard telehealth service to ships both in international waters and within the coastlines of states.

Funding

There is no financial relationship to disclose.

Conflict of interest

There is no conflict of interest between the authors concerning the materials or methods

used in this study or the findings specified in this paper.

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