

RESEARCH

Open Access



Current status of forensic anthropology in the Middle East and North Africa (MENA) region

Cindy Mansour^{1*}, Nicholas Márquez-Grant² and María Benito Sánchez¹

Abstract

Background Forensic anthropology has evolved significantly, from its foundations in the nineteenth century to its formal establishment in the twentieth century and in particular with modern advancements from the 1970s onward. Its role in human rights investigations during the 1980s in Latin America and the 1990s in the Balkans, exemplifies its global impact. However, the practice and application of forensic anthropology in the Middle East and North Africa (MENA) region remain underexplored. This study assesses the current status of forensic anthropology in this region through a brief literature review and online interviews with academics and practitioners in forensic anthropology or closely related disciplines. The interviews addressed the medico-legal system structure, forensic science capabilities, training efforts, practitioner availability, case types (medico-legal and humanitarian), and resources like radiological imaging.

Results The study revealed that forensic anthropology is largely underutilized in the MENA region's medico-legal death investigation systems. Factors such as limited human capital, lack of discipline awareness, varying legal and procedural systems, and insufficient academic infrastructure hinder its integration. Challenges include political instability, safety concerns for practitioners, and inadequate resources. The study highlights ongoing efforts by practitioners to improve the field through theoretical and practical training, capacity building, and resource development.

Conclusion The findings underscore the need for strategic investments to strengthen forensic anthropology in the MENA region. Recommendations include enhancing education and training, fostering interdisciplinary collaboration, disseminating scientific knowledge, increasing access to resources, and revising medico-legal frameworks. These measures can bridge existing gaps and advance forensic anthropology's role in medico-legal and humanitarian contexts.

Keywords Forensic anthropology, Forensic science, Middle East, North Africa, MENA region, Survey

Introduction

Forensic anthropology is the specialized application of biological or physical anthropological theories and methods to contexts of medico-legal, human rights, and humanitarian importance (Guyomarc'h & Congram 2017). These problems can vary from individual forensic cases to mass fatality incidents such as natural disasters, wars, explosions, transportation accidents, and other causes. The discipline traditionally derives from anatomy, biological anthropology, and forensic medicine (Kranioti & Paine 2011). Forensic anthropologists,

*Correspondence:

Cindy Mansour
cindyman@ucm.es

¹ Department of Legal Medicine, Psychiatry and Pathology - Forensic Anthropology Laboratory, Complutense University of Madrid, Avd. Complutense sn, Facultad de Medicina, Madrid, Spain

² Cranfield Forensic Institute, Cranfield University, Cranfield, Bedfordshire MK43 0AL, UK

in addition to working with forensic archaeologists, may conduct search and recovery operations, identify and handle deceased individuals, interpret surrounding death circumstances in medical-legal and humanitarian contexts, and identify living people. Therefore, forensic anthropology has evolved with time and varies globally (Márquez-Grant & Roberts 2021). Some work has been published on the development of forensic anthropology in Latin America (Lourdes 2021; ALAF 2023), the United States of America (USA) (Kranioti & Paine 2011; Stewart 1979; Passalacqua et al 2023; Ubelaker 2018; Blau et al 2016; Ubelaker 2023), Europe (Kranioti & Paine 2011; Márquez-Grant & Roberts 2021; Brickley 2007; Komar & Buikstra 2008; Petaros et al. 2021; Márquez-Grant & Fibiger 2011; Groen 2015; Alfsdotter et al. 2022), and in other countries such as South Africa (L'Abbé 2012), India (Baryah et al. 2019), the Philippines (Go 2018), Thailand (Traithepchanapai 2013), and Australia (Mallett & Evison 2017). Across Europe, there has been a significant rise in forensic anthropology research and teaching. Many universities now offer specialized training programs in this field and related disciplines. A comprehensive list of these opportunities is available on the FASE (Forensic Anthropology Society of Europe) website (<https://forensicanthropology.eu/fa-in-europe/institutes/>). However, in many European nations, forensic pathologists trained in forensic anthropology still undertake the bulk of the forensic anthropology casework within institutes of legal medicine, unlike countries like the UK; thus, this practice varies by country (Kranioti & Paine 2011; Ubelaker 2018; Cunha 2006). In the USA, forensic anthropology is a unique academic and professional path where the roles of forensic pathologists and forensic anthropologists are distinct. Forensic anthropology in the USA is well-integrated into legal systems, with numerous certified professionals working on a high volume of criminal, historical, and disaster cases, often supported by agencies like the FBI and the Department of Defense Prisoner of War/Missing in Action Accounting Agency (Ubelaker 2018).

Despite the general acknowledgment of the significance of forensic anthropology worldwide, there needs to be more understanding of the current status of forensic anthropology practice in Middle Eastern and North African countries (MENA) (Alfsdotter et al. 2022; Swed et al. 2022; Congram et al 2016; Maalouf 2015; Ferllini 2017). Therefore, it is crucial to bring together students and professionals from forensic anthropology, forensic medicine, odontology, genetics, and related disciplines across different MENA regions to exchange knowledge about the current state of forensic medicine and anthropology

in their respective countries. This includes discussing available expertise, ongoing practices, research, education, and employment rates. Additionally, it is essential to identify the challenges and gaps for further development and emphasize the importance of recognizing these fields as significant and independent disciplines.

This paper aims to gather information on the current status of forensic anthropology in the MENA region.

Materials and methods

Countries in the MENA region

The first step was to determine the countries in the Middle East and North Africa (MENA) region. There is no agreed-upon definition of the Middle East and North Africa; several organizations categorize the region into various territories. According to the Office of the United Nations High Commissioner for Human Rights (OHCHR), the countries that form the MENA region are the following (in alphabetical order): Algeria, Bahrain, Egypt, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Syria, Tunisia, United Arab Emirates, and Yemen (United Nations 2021). Some other sources, like the United Nations Statistics Division (UNSD), omitted Iran and included Turkey, and the World Bank omitted Turkey and included Djibouti (World Bank 2025 <https://www.worldbank.org/en/region/mena>).

Qualitative methodology

The study adopted a qualitative research design, utilizing semi-structured interviews as the primary data collection method.

Qualitative interviews

The study employed online semi-structured interviews from January 2023 to November 2023.

Sample

Experts from diverse fields, including those based at universities, police forces, forensic medicine and anthropology consultants, international human rights and humanitarian organizations, and medico-legal institutes, were found through research on PubMed, reviews of international forensic science journals, targeted keyword searches such as “forensic anthropology” and “the MENA region,” institutional directories, forensic conferences, and personal contacts and referrals from interviewees. The author communicated with 74 individuals from 19 countries (Table 1). Given the small sample sizes, no efforts were made to analyze statistical differences between countries.

Table 1 The count of respondents from the MENA region among those contacted

Country	Number of individuals contacted	Number of individuals responded	Title/role/area of expertise	Affiliation
1. Algeria	2	2	• Forensic pathologist • Biological anthropologist	→Academia →Healthcare (hospital)
2. Bahrain	2	0	-	-
3. Egypt	9	2	• Forensic pathologist • Forensic anthropologist	→Academia →Healthcare (hospital)
4. Iraq	6	3	• Forensic pathologists • Forensic odontologist • Archaeologist	→Academia →Healthcare (hospital) →International Humanitarian Organizations
5. Israel	0	0	-	-
6. Jordan	2	2	• Forensic pathologists	→Healthcare (hospital)
7. Kuwait	4	1	• Forensic pathologist	→Healthcare (hospital)
8. Lebanon	6	5	• Forensic anthropologists • Archaeologist • Forensic scientist	→International Humanitarian Organization →Academia →Directorate General of Antiquities →Freelance Consultancy
9. Libya	2	0	-	-
10. Morocco	2	1	• Forensic pathologist	→Healthcare (hospital) →Academia
11. Oman	1	0	-	-
12. Palestine	2	0	-	-
13. Qatar	3	0	-	-
14. Kingdom of Saudi Arabia	9	1	• Forensic anthropologist	→Consultant
15. Syria	4	4	• Forensic pathologists • Forensic odontologist	→Academia →Healthcare (hospital) →International Humanitarian Organization
16. Tunisia	4	2	• Forensic pathologists	→Healthcare (hospital)
17. Turkey	8	2	• Forensic pathologist • Forensic anthropologist	→Academia
18. United Arab Emirates	6	1	• Forensic anthropologist	→Police
19. Yemen	2	1	• Forensic pathologist	→Academia →Healthcare (hospital)
Total	74	27		

Questionnaire

The first author (C. M.) conducted the interviews in Arabic and English, using a structured approach with seven open-ended questions. The questionnaires were originally designed in English and subsequently translated into Arabic, given that most participants spoke Arabic. Depending on the convenience and preferences of the participants, the interviews were conducted using meeting apps such as Zoom or WhatsApp call/video. The inquiries encompassed a range of subjects, such as the structure of medico-legal institutes, the capabilities of forensic science, the number of forensic anthropologists, their engagement in diverse cases, research, educational initiatives, challenges, and suggestions for future development in the field in every studied nation.

Further sub-questions to guide the interview were left open for discussion between the interviewer and the interviewee.

Survey results

The results of the interviews are provided below for each of the questions and sub-questions asked. The statements in the results section are a verbatim compilation of the interviewees' opinions, not the author's interpretation.

A total of 27 interviews were conducted, with participants from 13 countries. Table 1 provides the number of individuals who responded from those who were contacted for each MENA country, with their respective affiliations.

Question 1: Is the discipline of forensic anthropology recognized in your country?

In all 13 nations mentioned, forensic anthropology is not a recognized discipline operating independently; instead, it is incorporated within the practice of forensic medicine.

With ties to several ministries, the integration of forensic anthropology with forensic medicine takes place either at the request of a forensic pathologist or under the guidance of the public prosecutor. The placement of forensic medicine under different ministries in various countries is influenced by the specific needs and legal and administrative preferences of the organizational structures of each country's government. Additionally, countries might model their forensic medicine system on those of other countries with similar legal or health systems. For instance, the Ministry of Interior, often responsible for police and security forces, might oversee forensic units focusing on crime scene investigation and evidence collection, as is the case of Algeria, Kuwait, and the Kingdom of Saudi Arabia. When forensic medicine is under the Ministry of Justice, the focus is often on providing evidence for criminal cases, supporting the judiciary, and ensuring that legal processes are supported by scientific evidence, as is the case in Egypt, Lebanon, Syria, Tunisia, Turkey, United Arab Emirates, and Yemen. The Ministry of Health might oversee forensic medicine to address public health issues, investigate causes of death, and handle mass casualties or epidemics as adopted in Algeria, Iraq, Jordan, the Kingdom of Saudi Arabia, Morocco, Syria, Tunisia, and Turkey. This aligns forensic medicine with broader health and medical services. Furthermore, incorporating forensic medicine into higher education ministries fosters interdisciplinary collaboration, ensures students receive a well-rounded education, and promotes research in forensic techniques. Each country has developed its approach based on its unique needs and organizational structure.

Remarkably, as mentioned by the participants, there are two MENA nations with separate institutes devoted to independent forensic anthropology laboratories: Algeria and Iraq. There might be a possibility that other countries have independent forensic anthropology laboratories in their system, but this was not mentioned.

Algeria

Five research teams in Algeria came together to form the forensic anthropology laboratory, founded by the University of Algiers 1 in 2020 (forensic anthropology, forensic pathology, forensic odontology, and forensic biology). The Ministry of Health and the Ministry of Higher Education both oversee this institute, which supports

research, knowledge advancement in forensic science, and the development of forensic anthropology in the nation.

Iraq

Under the direction of the Ministry of Health, the forensic anthropology section in Iraq is run by the medico-legal directorate (MLD). An anthropological laboratory, a DNA lab, and an antemortem/postmortem data unit are all part of the MLD's mass grave department (MGD). This laboratory employs genetic and anthropological research to identify human skeletal remains. In addition, the Martyrs Foundation, which is closely associated with the Prime Minister's Office, manages the exhumation and excavation of war and conflict casualties. Additionally, Iraq is notable for being the first nation to pass a Law on the Protection of Mass Graves in 2005, which established a legal structure for victim identification, missing person searches, and the management of deceased remains. The Ministry of Defense is in charge of cases involving Iraqi and Iranian human remains, while the Ministry for Human Rights coordinates this effort.

Question 2: Are there any forensic anthropology specialists working in your country?

Although the interviewees noted that Iraq and Algeria are the only countries in the MENA region with independent divisions dedicated explicitly to forensic anthropology, there are forensic anthropologists with formal university or higher education training in several other MENA countries. This refers to either obtaining university degrees (bachelor's, master's, doctorate) abroad, receiving certification/diploma courses, or enrolling in training programs offered by forensic organizations, academic institutions, workshops through conferences, NGOs, and government agencies, which combine theoretical knowledge with practical experience.

Calculating the precise number of forensic anthropologists in the region proved challenging. However, analysis of participant counts and interviewee data revealed that five nations; Lebanon, Jordan, the UAE, Saudi Arabia, and Turkey, have formally trained forensic anthropologists, while the remaining eight; Algeria, Yemen, Morocco, Syria, Iraq, Egypt, Tunisia, and Kuwait, do not have such professionals. In these countries, and sometimes even those with trained forensic anthropologists, forensic pathologists often take on forensic anthropology case-work, occasionally collaborating with forensic anthropologists where available. They receive their training in forensic anthropology methods through global training programs provided by international organizations, local initiatives by nongovernmental organizations (NGOs),

medical residency programs, fellowship programs, or diploma courses offered by academic institutions.

Question 2a: If yes, how many forensic anthropology practitioners are there?

According to the interviewees' responses, Lebanon and the UAE each have between 1 and 3 forensic anthropology practitioners with formal degrees in the field. Jordan, KSA, and Turkey have 4 to 6 professionals with formal degrees in forensic anthropology. In countries like Algeria, Syria, Yemen, Morocco, Iraq, Egypt, Tunisia, and Kuwait, where there are no forensic anthropologists with formal degrees; cases involving human remains are generally managed by forensic pathologists. In some of the latter countries, individuals may act as forensic anthropologists but only possess training rather than a formal degree.

Question 3: If there are no forensic anthropologists, who handles cases of human skeletal remains?

In Algeria, between 10 and 20 forensic pathologists work in the forensic anthropological laboratory, researching and examining human skeletal remains. In Yemen, between 1 and 4 forensic pathologists are primarily responsible for such cases. Morocco employs at least 24 forensic pathologists involved in crime scene investigations and autopsies and collaborate with other medical professionals to work on forensic anthropology cases. In Iraq, although there are no official forensic anthropologists recorded, between 30 and 40 trained personnel from various medical backgrounds, including pharmacists, dentists, nurses, and medical assistants, handle skeletal remains. In Lebanon, forensic anthropologists, at least 25 crime scene investigators, and pathologists from the Internal Security Forces carry out anthropological analyses of skeletal remains in civil and criminal cases. In Turkey, forensic anthropologists at universities may be requested to assist forensic pathologists based in medico-legal institutes in examining human remains when needed. Various organizations, such as police and gendarmerie criminalistics departments, along with specialized forensic scientists, are also involved in examining human skeletal remains in forensic contexts. Egypt relies on at least 100 forensic pathologists for autopsies, skeletal remains identification, and excavations when needed. Universities employ forensic anthropologists in Egypt and conduct numerous research projects to establish population-specific standards for sex, age, and stature estimation, often using various imaging techniques. However, they typically do not handle state cases. In Tunisia, between 50 and 60 forensic pathologists are the only professionals authorized to handle cases involving skeletonized remains. Similarly, between 30 and 60

forensic pathologists manage forensic anthropology case-work in Kuwait and Jordan.

Question 4: How is forensic anthropology taught?

The educational background of professionals who deal with human skeletal remains in forensic settings differs significantly from one country to another. Based on the respondents, the evident challenge in forensic anthropology is the need for more educational programs, credentials, awareness or experience, especially in biological/physical anthropology with a focus on forensics.

Of the 13 MENA nations studied, only 2 (14%) claim that formal study in forensic anthropology is offered in university degree programs at bachelor's and master's levels. The anthropology departments of Istanbul University, Ankara University, and Hacettepe University in Turkey, as well as the Anthropology Department of Yarmouk University in Jordan, are renowned institutions that provide these kinds of programs.

Algeria does not offer a degree in forensic anthropology; instead, this field is covered in forensic medicine during medical residency. However, at the time of writing, the University of Algiers 1 is developing a 2-year diploma course in forensic anthropology, combining theoretical and practical training. In addition, a notable achievement is the forensic lab accreditation at the *Institute Nationale de Criminalistique et Criminologie (INCC)* of the Algerian Gendarmerie, which includes forensic anthropology among its accredited disciplines. Similar situations are found in Kuwait, Yemen, Morocco, Tunisia, and Syria, where forensic pathologists handle human skeletal remains, gaining expertise in osteology and skeletal identification during their forensic medicine residency or through international humanitarian organization training. In Syria, this training is often provided by the International Committee of the Red Cross (ICRC) or local NGOs, while in Tunisia, it is offered by the British Embassy and Interpol. In Kuwait, new police recruits in the Disaster Victim Identification Team receive training from foreign specialists, including seminars and practical sessions in the Kuwaiti desert.

In the UAE, the Ministry of Health and the Health Authority in Abu Dhabi license specialists in forensic anthropology, but the universities do not teach the subject. Many UAE police departments send forensic scientists to universities in the UK, Australia, and the USA for undergraduate and postgraduate training in various forensic fields. In Egypt, over 26 universities and private institutions have forensic medicine and toxicology departments that include forensic anthropology topics in their undergraduate and postgraduate curricula. The Egyptian Board of Forensic Medicine and Toxicology also

offers courses and exams incorporating forensic anthropology and odontology credits.

In Iraq, forensic anthropology is taught as a short training course for biologists, nurses, pharmacists, and dentists working with the medico-legal directorate, supported by international organizations like the International Committee of the Red Cross (ICRC), International Commission on Missing Persons (ICMP), United Nations Investigative Team to Promote Accountability for Crimes Committed by Da'esh/ISIL (UNITAD), and the Argentine Forensic Anthropology Team (Equipo Argentino de Antropología Forense) (EAAF). This support includes educational curriculum assistance, fundamental DNA analysis, skeletal case analysis, conference and course attendance facilitation, equipment provision, mass grave protection, and cemetery maintenance.

In the Kingdom of Saudi Arabia, forensic medicine programs, including forensic anthropology, are available at the bachelor's and master's levels. In Lebanon, at least five universities offer basic osteology and forensic anthropology modules in bachelor's and master's courses in forensic science, criminology, biotechnology, or disaster management, yet practical training is limited. Research, documentation, and identification skills can be developed through organizations like ACT for the Disappeared (<https://www.actforthedisappeared.com/>) and humanitarian groups like the offices of the United Nations and ICRC.

Additional education and training in forensic anthropology in the MENA region include guest speakers at forensic science conferences such as The Conference of the Arab Society for Forensic Sciences and Forensic Medicine, Emirates International Forensic Conference & Exhibition, World Police Summit, and GCC Forensic Science Conference.

Programs and degrees in other MENA countries not covered in this study, such as Qatar, Bahrain, Libya, and Oman, were identified through online sources rather than direct input from participants. Specific keywords like “forensic anthropology/anthropology/forensic science/archaeology courses in Libya/Oman/Bahrain/Qatar” were used to find relevant courses by looking through university programs and degrees and educational platforms.

For instance, in Qatar, Qatar University offers a Bachelor's in Archaeology and Heritage program covering various aspects of archaeology, including studying human remains within an archaeological context. While the program emphasizes the heritage and cultural significance of artifacts and historical sites in Qatar, there could be opportunities to engage with bioarchaeological and osteological studies (<https://qm.org.qa/en/about-us/archaeology-and-heritage/>). The School of Social Sciences

and Humanities at the Doha Institute for Graduate Studies (<https://www.dohainstitute.edu.qa/en/Academics/SOSH/Pages/Programs.aspx?ProgramId=8>) and the Faculty of Arts and Sciences at Texas A&M University in Qatar (<https://www.qatar.tamu.edu/academics/arts-and-sciences/courses>) could also include relevant programs in anthropology in the region but not in forensic anthropology.

In Oman, the Department of Archaeology at Sultan Qaboos University (<https://www.squ.edu.om/art/Departments/Archaeology-Department>), along with the College of Medicine and Health Sciences (previously Oman Medical College) (<https://nu.edu.om/medicine/>), offer anthropology-related programs. While these institutions do not provide specialized forensic anthropology programs, they have anthropology departments (<https://edurank.org/liberal-arts/anthropology/om/>).

After a thorough investigation, it appears that Bahrain does not currently offer specialized programs in forensic anthropology, physical anthropology, or osteology. This conclusion is based on a review of available information through a Google Search, which shows no related academic programs or courses in these fields. However, this does not definitively rule out the existence of such studies, as further local or niche offerings might not be widely listed online.

In Libya, certain elements relevant to forensic studies are integrated within broader programs. For example, the University of Tripoli (<https://uot.edu.ly/moduledescription.php?module=ZO327&program=117&lang=en>) offers forensic science courses that cover crime scene analysis, evidence collection, forensic biology, and other foundational topics. This curriculum intersects with anthropology, particularly forensic DNA profiling and biological evidence interpretation. However, the focus is more on general forensic sciences than forensic anthropology. The University of Benghazi focuses on medical, scientific, and applied disciplines, though detailed information on anthropology programs is not readily available. The university's departments lean toward anatomy, embryology, forensic medicine, and medical sciences (For more specific details, contacting the university directly or exploring faculty pages might provide more insight into potential anthropology-related programs: <https://medportal.uob.edu.ly/?lang=ar>).

Question 5: What are the types of casework that forensic anthropology practitioners are involved in?

The information obtained from this question was intended to investigate the types of cases showcased in Table 2 that involve applying forensic anthropology techniques (skeletal analysis, identification of decomposed body, and trauma analysis).

Table 2 Types of forensic anthropology casework in the MENA region presented per country

Country	Casework of forensic anthropological significance involving bodies that are decomposed or found skeletonized
Algeria	<ul style="list-style-type: none"> • Civil war mass graves as a result of the 1989–1999 coup d'état • Migrant and refugee cases especially from the Mediterranean Sea • Cases such as homicides and suicides where skeletonized remains are found • Accidental discovery of human remains found as a result of natural or accidental deaths
Egypt	<ul style="list-style-type: none"> • Civil war mass graves of ongoing political instability in the Sinai Peninsula since 2011 • Disaster victim identification (DVI): flooding and transportation (rail, air) accidents • Cases such as homicides and suicides where skeletonized remains are found • Accidental discovery of human remains found as a result of natural or accidental deaths
Iraq	<ul style="list-style-type: none"> - Cases such as homicides and suicides where skeletonized remains are found - Accidental discovery of human remains found as a result of natural or accidental deaths - Civil war mass graves from past conflicts: <ul style="list-style-type: none"> ● Iraq-Iran War (1980–1988) ● Iraq-Kuwait war (1990) ● Invasion of US armed forces (2003) ● Yazidi massacre (2007)
Jordan	<ul style="list-style-type: none"> • Border crossing identification: migration between Jordan and the Kingdom of Saudi Arabia • Cases such as homicides and suicides where skeletonized remains are found • Accidental discovery of human remains found as a result of natural or accidental deaths
Kuwait	<ul style="list-style-type: none"> • Caseload as a result of mass graves from the Gulf War (1990) • Cases such as homicides and suicides where skeletonized remains are found
Kingdom of Saudi Arabia	<ul style="list-style-type: none"> • Most recoveries focused on skeletonized individuals found in the desert or mountains • Accidental discovery of human remains found as a result of natural or accidental deaths • Cases such as homicides and suicides where skeletonized remains are found
Lebanon	<ul style="list-style-type: none"> • Mass graves as a result of the Lebanese Civil War (1975–1990) • Mass disasters including the Beirut blast (2020) • Border crossing identification: displacement and migration are major issues between Lebanon and Syria • Cases such as homicides and suicides where skeletonized remains are found
Morocco	<ul style="list-style-type: none"> • Mass graves related to the conflict in Western Sahara in 1970 • Border crossing: displacement and migration between Morocco and other North African countries or European countries such as Spain • Cases such as homicides and suicides where skeletonized remains are found
Syria	<ul style="list-style-type: none"> - Missing person cases and human rights investigations (summary execution, arbitrary imprisonment, etc.) - Cases of mass disasters (earthquakes) - Cases such as homicides and suicides where skeletonized remains are found - Caseload as a result of civil war mass graves from past conflicts: <ul style="list-style-type: none"> ● Syrian civil war (2011–present) ● Syrian–Turkish war (2018–present) ● Syrian–Israeli conflict (various periods) ● Conflict with ISIS (2014–2019)
Tunisia	<ul style="list-style-type: none"> • Cases of human remains resulting from terrorist events in touristic places (last one in 2015) • Illegal immigration and border crossing through maritime routes • Accidental discovery of human remains
Turkey	<ul style="list-style-type: none"> • Cases of human rights violations (unlawful arrests, limitations on free speech, and enforced disappearances) • Cases of mass disasters (earthquakes) • Unidentified murders due to opposing regimes (1980–1990)
United Arab Emirates	<ul style="list-style-type: none"> • Cases such as homicides and suicides where skeletonized remains are found • Accidental discovery of human remains found as a result of natural or accidental deaths • Cases of migration between the UAE and Oman border
Yemen	<ul style="list-style-type: none"> • Mass graves as a result of the Yemeni civil war (2014–current) • Cases such as homicides and suicides where skeletonized remains are found • Accidental discovery of human remains found as a result of natural or accidental deaths

Question 6: What are some of the challenges in forensic anthropology?

The following answers, supplied by the participants, illustrate several difficulties and problems associated with the forensic anthropology discipline in different Middle Eastern and North African nations.

Egypt

Forensic pathologists in Egypt are tasked with multiple roles, including those that go beyond their expertise, such as examining human remains. Despite not being specialized in this area, they are the only professionals authorized to manage cases involving human skeletal remains. This dual responsibility often leads to a bottleneck in efficiently handling and identifying remains due to the limited specialization in forensic anthropology.

Iraq

The Iraqi government estimates a vast number of missing persons, ranging between 250,000 and 1 million, primarily from the era of the former Iraqi regime, the Gulf War, and the period of ISIS control. The Mass Graves Directorate, under the Martyrs' Foundation, and the Medico-Legal Directorate, under the Ministry of Health, face a severe shortage of trained forensic anthropologists and medical professionals proficient in human identification techniques. This shortage hampers the effective identification and documentation of human skeletal remains.

Jordan

In Jordan, career opportunities for forensic anthropologists are scarce due to low demand. Many graduates in forensic anthropology find themselves working in roles such as autopsy or mortuary technicians or as assistants to forensic physicians. Some pursue additional training to work in firearms, DNA, or biological laboratories under the Ministry of Interior, highlighting a mismatch between their training and available job role.

Kingdom of Saudi Arabia

In Kingdom of Saudi Arabia, there is a significant shortage of forensic anthropologists. Consequently, forensic pathologists often assume responsibilities for examining and identifying human skeletal remains. According to Islamic law and cultural norms, remains should not be excavated or disturbed unnecessarily once found, reflecting a deep respect for the deceased and for religion. These cultural sensitivities profoundly influence forensic

investigations, necessitating careful handling and adherence to religious and cultural values.

Kuwait

The Gulf War in 1990 resulted in the deaths of hundreds of Kuwaitis, with over 600 still missing. A lack of local forensic anthropologists and specialized experts hinders efforts to locate and identify the missing. While some human remains have been found and returned to families, many remain unaccounted for, complicating the search and identification process.

Lebanon

Despite having mapped and documented numerous mass graves, with an estimated 7000 missing individuals since the Lebanese Civil War (1975–1990), Lebanon faces a severe shortage of professionals and training in forensic anthropology and forensic medicine. The absence of a dedicated forensic anthropology discipline, coupled with a lack of studies related to human remains, presents significant challenges for future exhumation and identification efforts.

Syria

Syria has numerous mass graves due to war crimes, but these graves have not been professionally excavated to facilitate victim identification and the return of the remains to their families. The country suffers from a shortage of forensic pathologists and lacks forensic anthropologists entirely, impeding proper forensic investigations.

Tunisia

The demand for forensic anthropologists in Tunisia is currently low. This limited demand translates into few career opportunities and a general lack of focus on developing this specialization within the country.

Turkey

Although Turkey has professionals in the field, forensic anthropology needs to be more utilized. The educational curriculum needs greater standardization, and the examination of human remains is predominantly conducted by forensic pathologists with limited collaboration with forensic anthropologists. This underutilization reflects gaps in integrating forensic anthropology into mainstream forensic practices.

United Arab Emirates (UAE)

In the UAE, there needs to be more awareness about the forensic anthropology specialization across various judicial and police organizations. Additionally, there needs to

be more standard operating procedures and specialized forensic laboratories, which hampers the development and application of forensic anthropology practices.

Question 7: What are some insights and recommendations for the forensic anthropology discipline?

The recommendations based on the opinions of interviewees highlight several similar key areas for improvement in the field of forensic anthropology in the mentioned countries. Given the similarity in participants' answers, summaries were generated.

1. Raise awareness and build interest

- Stakeholders and policymakers should actively raise awareness about the importance of forensic anthropology.
- Efforts should be made to build interest and create opportunities for the next generation of forensic anthropologists.

2. Capacity building and recruitment

- Countries with increased caseloads of skeletonized remains (such as Kuwait, Iraq, Yemen, Lebanon, and Syria) should focus on capacity building.
- There should be an increase in the recruitment of local forensic anthropologists to address the growing demand for their expertise.

3. Bridging the gap between practitioners and academia

- Efforts should be made to bridge the gap between practitioners and academia.
- Foster collaborations between forensic experts and legal institutions nationally and internationally.

4. Establishment of an association

- Consider creating an association or a society for all the forensic anthropologists in the Middle East and North Africa region.
- This association can serve as a platform for discussing cases, knowledge exchange, promoting training, and establishing standards and certifications.

The abovementioned recommendations aim to enhance forensic anthropology in the aforementioned nations by adopting a comprehensive approach that prioritizes

education, capacity building, collaboration, and forming a supporting professional network.

Discussion

The current status of forensic anthropology in the MENA region offers valuable insights into how forensic anthropology is organized, taught, and practiced within the national legal systems of various MENA countries. According to the interview findings, forensic anthropology in the MENA region encounters numerous challenges. Countries like Algeria, Iraq, Libya, Lebanon, Syria, and Yemen have endured prolonged conflicts, political instability, and a scarcity of resources and funding, which have hindered the development and implementation of advanced forensic methods. These nations, frequently burdened with substantial caseloads, urgently need to develop this discipline.

Limited educational institutions and training opportunities in forensic anthropology are also significant barriers hindering the field's growth. Only 2 (Jordan and Turkey) out of 13 studied countries have universities that offer forensic anthropology as a bachelor's, master's, and/or doctorate degree. Graduates from these universities often find employment in fields unrelated to their formal degrees. In addition, since forensic pathologists have a more significant influence on anthropological casework, they may prioritize their work and research in other areas over forensic anthropology.

The unclear definition and absence of a formal framework for forensic anthropology alone can also lead to unqualified experts or practitioners being called upon to provide anthropological opinions in court, which could result in faulty or incorrect opinions, posing significant legal risks.

Initiatives to improve forensic anthropology training opportunities in the Middle East and North Africa are still in the initial stages. However, there is a strong desire among these nations to expand their understanding of the discipline. To improve collaboration, streamline procedures, and ensure appropriate expertise in skeletal remains cases, it is recommended to establish national guidelines for their handling and, secondly, to systematically inform other forensic stakeholders about forensic anthropology capabilities. This includes offering lectures, seminars, and other educational opportunities to further educate stakeholders, medical, nonmedical, and other forensic professionals on the importance of the discipline with existing and previous literature, surveys, textbooks, and previous studies (e.g., (Alfsdotter et al. 2022; L'Abbé 2012; Baryah 2019; Go 2018)).

Forensic anthropologists play a critical role not only in the identification of skeletal remains but also in autopsies requiring reconstruction of fractures and maceration

and providing second opinions on trauma mechanisms. Their expertise extends to examination of living individuals, and aiding in trauma analysis. Additionally, forensic anthropologists contribute to identifying human versus nonhuman bones, understanding taphonomy assessing taphonomic alterations, and developing standards and protocols within forensic investigations. In addition to assisting in humanitarian action, disaster victim identification, and research. This broad applicability underscores the necessity of forensic anthropology across various facets of forensic science (Smithsonian National Museum of Natural History 2025; Dolinak et al 2005; Christensen 2019). Forensic anthropology is vital in countries with high caseloads of human remains, such as Yemen, Syria, Lebanon, Iraq, and Kuwait, as it provides essential services in identification, justice, humanitarian aid, training, and cultural sensitivity, ultimately contributing to societal healing and the rule of law.

Increasing awareness could be in the form of integrating forensic anthropology courses into the curricula of medical and forensic science programs at universities in the MENA region or allowing more long-term training and specialization in forensic anthropology for medical doctors. Also, medico-legal institutes can develop or have access to online courses and e-learning modules that forensic professionals in the MENA region can access to learn about forensic anthropology at their own pace. Additionally, forensic anthropology can significantly increase the number and quality of publications by establishing partnerships with international forensic anthropology bodies and universities that facilitate access to resources, expertise, and funding, thereby enhancing research capabilities. More importantly, advocating for government policies to recognize and support the role of forensic anthropology within the forensic sciences framework and secure funding and resources for projects, research, and training programs, especially in countries with high humanitarian action.

The different casework that exists from mass disasters, war crimes, and other death scenes should create employment and research prospects for specialized forensic anthropologists to address the challenges of identifying human remains. Countries with high caseloads of conflict and violence lack an adequate number of forensic anthropologists and also do not provide education opportunities as they do not consider it an important subject and do not have sufficient funding. Namely, the example of Iraq has an anthropology laboratory without anthropologists. Other countries work with very sporadic cases of human remains yet have forensic anthropologists registered in their systems, as is the case of the UAE. The core recommendation for development is to establish integrated cooperation between countries that have high

caseloads of human remains, such as Yemen and Iraq, and that employ dedicated forensic anthropologists to examine the remains.

In addition, cultural and religious sensitivities and preferences in certain Middle Eastern and North African countries, such as the Gulf countries, should be addressed by providing cultural competence training to forensic professionals.

Furthermore, countries in the MENA region should align with the advancements, accreditations, certifications, training, and standard operating procedures in forensic anthropology seen worldwide. For instance, in Europe, the Forensic Anthropology Society of Europe (FASE) aims to encourage the study and practice of forensic anthropology, establish and enhance standards, promote training, and create a board of trained professionals (Cattaneo & Baccino 2002). Similarly, in the UK, the Royal Anthropological Institute (RAI) is dedicated to enhancing anthropological education (RAI, 2025 n.d.). In the USA, the creation of the American Board of Forensic Anthropology (ABFA) has set a precedent for professional standards in the field (ABFA 2018). In Latin America, the Asociación Latinoamericana de Antropología Forense (ALAF) serves a similar purpose, promoting the discipline and ensuring high standards of practice (ALAF 2003). To the interviewee's knowledge, there are no certifications in any of the countries in the MENA region that offer formal certification for forensic anthropologists following evaluation, testing, and approval by an examination board. There is an urgent need to establish a legal basis for the profession in these countries to standardize the education, training, and experience along with unifying procedures to ensure consistent credentials and service quality.

Nevertheless, as noted in the results, most MENA countries, forensic anthropology casework and research are carried out by forensic pathologists. While this dual role can streamline investigations, it has benefits and limitations. Despite having some knowledge related to forensic anthropology, forensic pathologists are primarily experts in analyzing the medical and pathological components of a case, as well as performing autopsies and determining the cause of death (Dolinak 2005; Christensen 2019). Combining forensic pathology and anthropology skills can provide a comprehensive approach to forensic investigations, potentially speeding up the investigative process. However, forensic anthropology requires specific training in skeletal biology, osteology, and anthropological methods that may not be covered comprehensively in pathology training, potentially affecting quality. In addition, to perform a forensic anthropology case without the proper expertise may be considered unethical. Forensic anthropologists are experts in this

field. In bodies in an advanced state of decomposition, a forensic anthropologist must be present from the beginning to assess the appropriate identifiers and ensure their proper integration. They, as expert, know and use scientific and technical rules and professional principles such as civil responsibility, appropriate FA terminologies, chain of custody, code of ethics, confidentiality, developing an FA case report, and other tasks.

Limitations

Despite multiple attempts, there were difficulties establishing contacts with professionals in Qatar, Libya, Bahrain, and Oman. This could be due to cultural or language barriers, lack of networking capacity, lack of the required knowledge, and security concerns where people might opt for safety in exchange for participating in research. Additionally, few participants were reluctant to identify themselves to maintain their anonymity. However, the survey results were unaffected by the nondisclosure; instead, it encouraged respondents to discuss essential subjects openly, resulting in more thorough and honest feedback in a politically delicate area. Furthermore, answers to these interviews may have faced variations between a forensic pathologist and a specialized forensic anthropologist. These differences in professional background and training could have shaped the approach and interpretation of questions and influenced the depth and nature of the information provided during the interviews. Furthermore, few participants were involved in the qualitative interview, so these answers could partially represent the status of the situation in their nations.

Additionally, it was difficult to ascertain from the interviews the estimated number of skeletal cases/cases of interest to FA per country. The number of cases (not individuals) is undoubtedly not hundreds per year, but this was not clarified.

Conclusion

In summary, the forensic anthropologists in the MENA region need more human resources, awareness, standardized protocols, and legal and academic support. Countries with high caseloads of conflict and violence lack an adequate number of forensic anthropologists and also do not provide education opportunities and do not have sufficient funding. Other countries work with very sporadic cases of human remains yet have forensic anthropologists registered in their systems. Generally, there is a gap in well-structured specialized education and working opportunities in forensic anthropology in the MENA countries. The core recommendation for development is to establish integrated cooperation between countries with high caseloads of human

remains and employ dedicated forensic anthropologists to examine skeletonized human remains. Most specialists within the police and medico-legal institutes understand that this discipline should be enhanced through theoretical and practical training, scientific dissemination, more funding, and improving local capability by creating a revised framework, standard operating procedures, and recommendations for best practices.

Abbreviations

ABFA	American Board of Forensic Anthropology
ALAF	Asociación Latinoamericana de Antropología Forense
DVI	Disaster Victim Identification
EAAF	Equipo Argentino de Antropología Forense
ICMP	International Commission on Missing Persons
ICRC	International Committee of the Red Cross
INCC	Institute Nationale de Criminalistique et Criminologie
ISIS	Islamic State of Iraq and Syria
MENA	Middle East and North Africa
OHCHR	Office of the United Nations High Commissioner for Human Rights
RAI	The Royal Anthropological Institute
UNITED	United Nations Investigative Team to Promote Accountability for Crimes Committed by Da'esh/ISIL
UNSD	United Nations Statistics Division

Acknowledgements

The authors would like to thank all listed forensic experts who kindly shared their knowledge on the current status of forensic medicine and anthropology in their countries: Dr. Dina Shokry (Egypt), Dr. Ghadeer Abdelaal (Egypt), Dr. Denise Abboud (Lebanon), Dr. Ibrahim Habash (Jordan), Mrs. Sarah Wafia (Kingdom of Saudi Arabia), Mr. Khudooma Alnuaimi (United Arab Emirates), Dr. Joyce Nassar (Lebanon), Dr. Oznur Gulhan (Turkey), Dr. Nada Elias (Lebanon), Dr. Wassim Mohammad Rihawi (Syria), Dr. Calil Makhoul (Lebanon), Mrs. Eman Obeidat (Jordan), Dr. Abdallah Dami (Morocco), Dr. Moussa Bourefis (Algeria), Dr. Chahnez Makni (Tunisia), Dr. Oguzhan Ekizoglu (Turkey), Dr. Mustafa Qays (Iraq), Mr. Rafael De Souza (Iraq), Dr. Yasmin Abdullah (Iraq), Dr. Alawadhi Abdullah (Kuwait), Dr. Mokhtar Alhrani (Yemen), and to all other responders who wished to remain anonymous.

Authors' contributions

AUTHORS' CONTRIBUTIONS Cindy Mansour: Conceptualization, Methodology, Investigation, Resources, Writing – Original draft, Writing – Editing, Visualization, Nicholas Marquez-Grant: Conceptualization, Methodology, Supervision, Resources, Writing – Editing, María Benito Sánchez: Conceptualization, Methodology, Supervision, Writing – Editing.

Funding

The study presented was supported by the Wenner-Gren Foundation under the Wadsworth International Fellowship, Gr. WIF-286.

Data availability

No datasets were generated or analysed during the current study.

Declarations

Ethics approval and consent to participate

The study was conducted in accordance with the ethical standards of the Universidad Complutense De Madrid Research Ethics Committee (Ref: CE_20240208_04_SAL). Informed consent to participate was obtained from all participants included in the study.

Consent for publication

Consent to publish was obtained from all participants.

Competing interests

The authors declare no competing interests.

Received: 7 October 2024 Accepted: 28 January 2025
Published online: 15 February 2025

References

- ABFA, 2018. <http://theabfa.org/>
- ALAF Forense, 2003, <https://www.alafforensis.org/>
- Alfisdottir C, Petaros A, Güvencel A, Molnar P, Teglin R, Alkass K (2022) Development and implementation of forensic anthropology in Swedish forensic practice. *Scand J Forensic Sci* 28(s1):10–19
- Asociación Latinoamericana de Antropología Forense (ALAF) (2025) Revista ALAF. ALAF. <https://www.alafforensis.org/es/revista-alaf>
- Baryan N, Krishan K, Kanchan T (2019) The development and status of forensic anthropology in India: A review of the literature and future directions. *Medico-Legal J* 59(1):61–69
- Blau S, Ubelaker DH (2016) Forensic anthropology and archaeology: Introduction to a broader view. In *Handbook of forensic anthropology and archaeology*. Routledge, New York, p 21–26
- Brickley M, Ferlini R. (Eds.) (2007) Forensic anthropology: Developments in two continents. In *Forensic anthropology: Case studies from Europe*. Springfield, Charles C. Thomas Publisher, LTD, p 3–18
- Cattaneo C, Baccino E (2002) A call for forensic anthropology in Europe. *Int J Legal Med* 116
- Christensen AM, Passalacqua NV, Bartelink EJ (2019) Forensic anthropology: Current methods and practice. Academic Press
- Congram D, Sterenberg J, Finegan O (2016) Continuing challenges for forensic archaeology and anthropology in Iraq. In S. Blau & D. H. Ubelaker (Eds.), *Handbook of forensic anthropology and archaeology* (pp. 605–616). Routledge
- Cunha E, Cattaneo C (2006) Forensic anthropology and forensic pathology: The state of the art. In *Forensic anthropology and medicine: Complementary sciences from recovery to cause of death* (pp. 39–53).
- Dolinak D, Matshes E, Lew EO (2005) Forensic pathology: Principles and practice. Elsevier
- Ferlini R (2017) Forensic anthropology in crisis settings: A required component of investigation in the world's trouble spots. *Human Remains and Violence: An Interdisciplinary J* 3(2):98–116
- Go MC (2018) Appraising forensic anthropology in the Philippines: Current status and future directions. *Forensic Sci Int* 288:329.e1–329.e9
- Groen WJM, Marquez-Grant N, Janaway R (Eds.) (2015) *Forensic archaeology: A global perspective*. Wiley
- Guyomarc'h P, Congram D (2017) Mass fatalities, mass graves, and the forensic investigation of international crimes. In: *Anthropology F* (ed) Derek Congram and Pierre Guyomarc'h (Boca Raton. CRC Press, FL, pp 353–364
- Komar DA, Buikstra JE (2008) *Forensic anthropology: Contemporary theory and practice*. Oxford University Press
- Kranioti E, Paine R (2011) Forensic anthropology in Europe: An assessment of current status and application. *J Anthropol Sci* 89:71–92
- L'Abbé, E. N., & Steyn, M. (2012). The establishment and advancement of forensic anthropology in South Africa. In D. C. Dirkmaat (Ed.), *A companion to forensic anthropology* (pp. 626–638). Oxford: Wiley-Blackwell.
- Maalouf L, Maalouf RC (2015) Forensic archaeology in Lebanon. In *Forensic archaeology: A global perspective*
- Mallett X, Evison MP (2017) Critical issues in the historical and contemporary development of forensic anthropology in Australia: An international comparison. *Forensic Sci Int* 275:314.e1
- Márquez-Grant N, Fibiger L (Eds.) (2011) *The Routledge handbook of archaeological human remains and legislation: An international guide to laws and practice in the excavation and treatment of archaeological human remains*. Routledge
- Márquez-Grant N, Roberts J (2021) Redefining forensic anthropology in the 21st century and its role in mass fatality investigations. *Eur J Anat* 25:19–34. ISSN 1136-4890
- Passalacqua NV, Langley NR, Pilloud MA, Tersigni-Tarrant MA (2023) Evaluating expertise in forensic anthropology. *J Forensic Sci* 68(4):1111–1120
- Petaros A, Caplova Z, Verna E, Adalian P, Baccino E, de Boer HH, Cunha E, others (2021) The Forensic Anthropology Society of Europe (FASE) map of identified osteological collections. *Forensic Sci Int* 328:110995
- Ramirez L (2021) Forensic anthropology in Latin America: Examining methods of human identification (unpublished Master's thesis, California State University, Stanislaus)
- Smithsonian National Museum of Natural History (2025) Forensic Anthropology. <https://naturalhistory.si.edu/education/teaching-resources/social-studies/forensic-anthropology#:~:text=Forensic%20anthropologists%20specialize%20in%20analyzing,and%20meticulously%20recording%20the%20evidence.>
- Stewart TD (1979) *Essentials of forensic anthropology: Especially as developed in the United States*. Springfield, Charles C. Thomas
- Swed S, Rais MA, Siddiq A, Shoib S (2022) Time to revamp forensic medicine specialty in the conflict Arab region. *Int J Surg* 105:106859
- Traithepchanapai P (2013) History, research, and practice of forensic anthropology. *Forensic Sci Int* 226:208–215
- The Royal Anthropological Institute (RAI) (2025) <https://therai.org.uk/>
- Ubelaker DH (2023) Forensic anthropology: Current issues. *A Companion to Biological Anthropology* 494–509
- Ubelaker DH (2018) A history of forensic anthropology. *American Journal of Physical Anthropology*. <https://doi.org/10.1002/ajpa.23577>
- United Nations (2021) Middle East and North Africa section. OHCHR. <https://www.ohchr.org/en/countries/middle-east-north-africa-region/middle-east-north-africa-section-hq>
- World Bank (2025) Middle East and North Africa. <https://www.worldbank.org/en/region/mena>

Publisher's Note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.



DSPACE

<https://dspace.org/>

Current status of forensic anthropology in the Middle East and North Africa (MENA) region

Mansour, Cindy; Márquez-Grant, Nicholas; Benito Sánchez, María

2025-02-15

Springer

<https://doi.org/10.1186/s41935-025-00423-7>

Mansour C, Márquez-Grant N, Benito Sánchez M. (2025) Current status of forensic anthropology in the Middle East and North Africa (MENA) region. Egyptian Journal of Forensic Sciences, Volume 15, Issue 1, February 2025, Article number 4