

ARTIKEL LAPORAN KASUS

**FORENSIC ANTHROPOLOGICAL ROLES IN DISASTER VICTIM
IDENTIFICATION OF TWO JAKARTA HOTELS'S BOMB BLASTS**

**PERAN ANTROPOLOGI FORENSIK DALAM IDENTIFIKASI
KORBAN BENCANA LEDAKAN BOM DI DUA HOTEL DI JAKARTA**

Etty Indriati

Faculty of Medicine Gadjah Mada
University. Jl. Farmako Sekip Utara,
Yogyakarta 55281

Korespondensi:

Etty Indriati, Faculty of Medicine
Gadjah Mada University. *E-mail:*
ettyindriati@ugm.ac.id

ABSTRAK

Latar Belakang: Antropologi forensik berperan penting dalam menentukan identitas personal sisa tubuh manusia pada bencana. Kematian yang disebabkan oleh bencana buatan manusia seperti ledakan bom seringkali memecah badan manusia menjadi fragmen-fragmen kecil—menyulitkan anggota keluarga dan teman korban untuk mengenali identitas korban.

Kasus: Artikel ini membahas kasus ledakan bom yang terjadi pada 17 Juli 2009, melukai 50 orang dan menyebabkan 9 kematian, di dua hotel, JWM dan RC, di Mega Kuningan, Jakarta. Tempat kejadian perkara/TKP diproteksi garis kuning polisi setidaknya 6 hari untuk memastikan semua fragmen badan korban ditemukan. Antropolog forensik membantu mencari fragmen-fragmen bagian badan yang tersebar ke segala penjuru di TKP untuk kemudian diperiksa di RS Polisi RS Sukanto Insalasi Forensik, Jakarta. Metode antropologi forensik untuk mengetahui ras, jenis kelamin, dan umur digunakan. Lima fase prosedur standar Disaster Victim Identification dari INTERPOL/International Police digunakan. Dari 9 jasad korban peledakan bom di 2 hotel di Jakarta, 2 orang merupakan pelaku bom bunuh diri, 1 orang adalah staf hotel, dan 6 orang adalah tamu hotel dari negara lain.

Kesimpulan: Kematian karena ledakan bom merusak jasad manusia cukup parah. Orang berada paling dekat dengan pusat ledakan jasadnya pecah berkeping-keping dan terlontar ke segala arah. Antropologi forensik berperan penting menentukan jumlah minimal individu dan identitas personal jasad manusia yang hancur.

Kata Kunci: antropologi forensik, identifikasi korban bencana, Jakarta, ledakan bom

ABSTRACT

Background: Forensic anthropology plays significant roles in determining the personal identification of human remains who died from disaster. Death caused by human-made disaster such as bomb blast often dismembered human bodies into small fragmented body parts—leaving it difficult for friends and family members to recognize the identity of the remains.

Case: This case study presents a case of bomb blast occurred on July 17, 2009

that injured 50 people and caused 9 deaths, in the JWM and the RC Hotel in Mega Kuningan, Jakarta. The crime scene was secured with the police line for at least 6 days to ascertain that all body parts from the blasts were recovered and examined at the Police RS Sukanto Hospital, Forensic Installation, Jakarta. The forensic anthropologist went to the crime scene helping to search for the highly fragmented remains. The forensic anthropological method of racial, sex, and age determination were applied. The 5 steps of procedure in Disaster Victim Identification of INTERPOL were used. Out of the 9 human remains identified in the bomb blast, 2 were suicide bombers, one is the hotel staff, and the remaining were the guests of multiple nationalities.

Conclusion: *Death due to bomb blasts left significant damage to the remains. Near the blast, human bodies were broken into hundred pieces of body parts and the blast threw the body parts far away from one another. Forensic anthropology plays significant role in determining the minimum number of individual and the personal identity of the remains.*

Key Words: *bomb blast, disaster victim identification, forensic anthropology, Jakarta,*

BACKGROUND

Forensic anthropology uses scientific method of skeletal and dental biology to reconstruct the personal identity of human remains that are either fragmented or whole, decomposed or partially decomposed, burnt, or skeletonized, to the point it is difficult to be recognized by people who know the person before death.¹ Mastering the theory of skeletal and dental biology along with broad experience in examining human skeleton from different race, culture, time frame, geographic regions, and circumstance of death are invaluable for the success in human identification from anthropological perspective. The positive identification of the remains uses one or more of the three primary biological traits originated from teeth and bones, fingerprints, and DNA. The secondary traits could come from photograph and property. The highly specialized field of forensic anthropology is overlooked in Indonesia, and expert in this field is rare.

Disaster often takes human lives within minutes, example is airplane crash, bomb blast, train crash, tsunami, earthquake, and volcanic eruption. Indonesia faced many risks of disasters.² The sudden nature of disaster causes mobilization of helps quite complex because experts from other regions need to fly in to the region of disaster. Four International Organization published a field manual for first responders in "Management of Dead Bodies after Disasters" including: Pan American Health Organization, World Health Organization, International Committee of the Red Cross, and International Federation of Red Cross and Red Crescent Societies.³ Due to the sudden nature of disaster, the first responder who help in body recovery often are people from the surrounding area.³ Morgan et al. make a list of important matter in body recovery: a) Body recovery is the first step in managing dead bodies and is usually chaotic and disorganized; b) Many different people or groups

are involved in body recovery. Communication and coordination with them is often difficult; c) Body recovery only lasts a few days or weeks, but may be prolonged following earthquakes or very large disasters; d) Process of body recovery can be essential for identification; e) Rapid retrieval is a priority because it aids identification and reduces the psychological burden on survivors; f) Recovery of bodies should not interrupt other interventions aimed at helping survivors; g) The workforce in body recovery include: surviving community members, volunteers, Search and Rescue teams, military, police or civil defense personnel; h) Bodies should be placed in body bags.³

In this case of bomb blast in two hotels in Jakarta, the body recovery lasts for 6 days. Although the blast is mild, the body fragmentation is rather severe due to the proximity of the bomb with the victims. After the body recovery, the postmortem examination immediately commenced to prevent further decomposition.

The INTERPOL's DVI Procedure

When disaster happens, there are five steps of procedure in disaster victim identification. Indonesia uses INTERPOL (International Police) Standing Committee on Disaster Victim Identification in Lyon, France (Form version 2002, new guide 2013).^{4,5} To record the data, it uses pink forms for postmortem examination and yellow forms for antemortem data gathering). The five steps are scene (searching and evacuating the remains), mortuary where postmortem examination is conducted, antemortem data compilation, reconciliation, and debrief-

release. The team includes forensic pathologist, forensic anthropologist, forensic molecular biologist, forensic dentist, scribe, photographer, and technician. Indonesia used the INTERPOL's DVI procedure for human recovery and identification. Not every country uses this procedure, for instance: the United States of America does not use this INTERPOL DVI's procedure. There are five phases in DVI^{4,5}:

Phase I: Scene, is searching for bodies, body parts, properties, mapping the area of disaster, labeling (if there are more than one sites—label differently), documentation, putting the bodies in body bags. It must be recorded where the location of the remains and anatomical position if the evacuator is trained in DVI. Often, those who came first to the disaster location are people living in the vicinity. Information where the body bag was originated is very important.

Phase II: Mortuary: Postmortem examination; usually in the hospital's morgue.

- a. Receive the body bag into mortuary after fingerprints were taken, and sign tracking form, make sure to get information where the body was originated.
- b. Write down body bag number and match with pink postmortem DVI form (forensic pathologist and scribe duties).
- c. Remove clothes, wash and rinse (technician duty), describe and record (photographer and scribe duties).
- d. Remove jewellery, personal effects, wash (technician duty), take a photograph with body bag number in it (photographer and scribe), and place in sealed bag, with body

tag (technician duty). Documentation include bodies, body parts, properties with tag number on it.

- e. Forensic anthropology identify sex, age, stature, ancestry.
- f. Take chest X-ray if many victims are elderly to detect possible pacemaker.
- g. Forensic pathology conducting autopsy, record tattoo, scars, evidence of injury, disease, and physical abnormality.
- h. Sign tracking form, examination complete (scriber).
- i. Examination of teeth. Take dental radiograph if there are dental fillings, jackets, or denture, to match with available dental record.
- j. Take sample for possible future DNA test.
- k. In cases of body fragmentation, record body fragmentations: what body parts are missing, right or left, upper or lower. i.e. one person cannot have 2 left ears; useful for identifying headless body and bodyless head.
- l. Taking samples for DNA examination (blood, tissue).

We recorded all postmortem examinations data in the **PINK forms**.

Phase III: Antemortem data compilation, the data is gathered from members of family, friends, doctor, dentist (medical record-for matching with primary identification traits). Data gathered include: vital signs, specific characters, jewelry, watch, clothes (for matching as secondary identification traits). We put all antemortem data into **YELLOW forms**. Antemortem data is

compiled through information given by family member and medical and dental records of the remains. The standard INTERPOL of antemortem form is yellow, while the postmortem form is pink. The different color of forms for antemortem data and postmortem examination result is important to not mix them up. What is information to gather in the yellow forms? There are form A to G, they are quite tedious work fill them all. Examples of antemortem data compilation from family members and friends: When did you last see him/her?; What clothes did he/she wear?; What brand of watch did he/she wear?; Do you know his/her shoe size?; Do you know how tall he/she was?; Do you have his/her latest photograph?; Did he/she ever have surgery, pacemaker, plate in part of the body?; Do you know whether she had family planning, i.e., had IUD?; Did he/she have unique physical characteristics? i.e. tattoo in his/her body; what kind of tattoo, mole, or birth mark?; Do you know whether he/she has a driver license? To collect data on stature, male or female, blood type, and fingerprint; Could you get the dental record from his/her previous dentist?; Could you give us the medical record from his/her previous medical care?.

Phase IV: Reconciliation. A phase when post-mortem examination is discussed to match with antemortem data.

1. To compare antemortem data with postmortem data.
2. Debate often occurred in this phase IV, when mis-matched.
3. Primary identification method: Teeth, fingerprint, DNA; Secondary identification method:

property, medic, photography, document.

4. When all parties provide evidence and proofs that matched/identified; signed and dated.

Phase V. Release Debrief. Human remains are released to the family member, along with letter of released.

The roles of forensic anthropology in identification of dead bodies are often overlooked. Even in the INTERPOL, there is no designated form for Forensic Anthropology Examination. This may be caused by its unique and highly specialized postgraduate training of forensic anthropology. To remedy the situation, in the INTERPOL forms, we put Forensic Anthropology Examination in Form G (FURTHER INFORMATION), while DENTAL FINDINGS is put in Form F2. Meanwhile, efforts have been made to make additional form specifically for forensic anthropology.

CASE

The minimum number individual, ancestry, sex, and age

The remains were brought from the scene to the Forensic Installation at the Police Hospital Bhayangkara RS Sukanto, Jakarta. There are 9 minimum number of individual identified from the bomb blast in the Jakarta JWM and RC Hotel (Figure 1). Body parts were examined, joint articulation and side of body part were numbered and put in body bag. Joint articulation and side of anatomical body part were used for individual reconstruction. For instance, a body without head and a head without body were examined on the breakage area to match which body belongs to which head of the same individual. Ear presence is also recorded, as none could have 2 right ears or 2 left ears. When the pubic symphysis of the pelvic bone were exposed, examination was carried out using Suchey-Brooks method for age

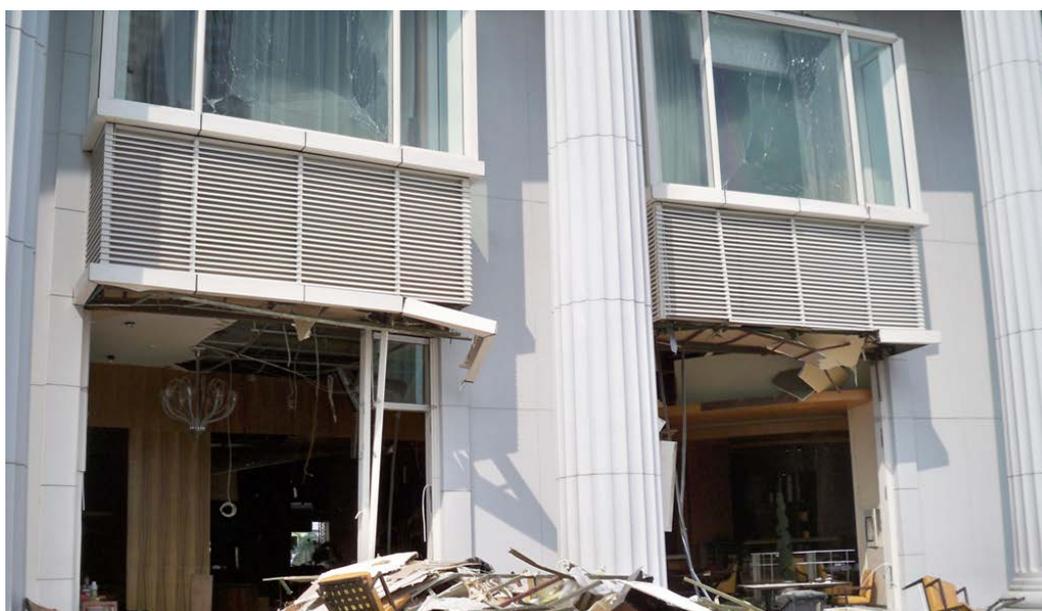


Figure 1. Debris from the low explosion bomb blast outside the RC Hotel in Mega Kuningan Jakarta

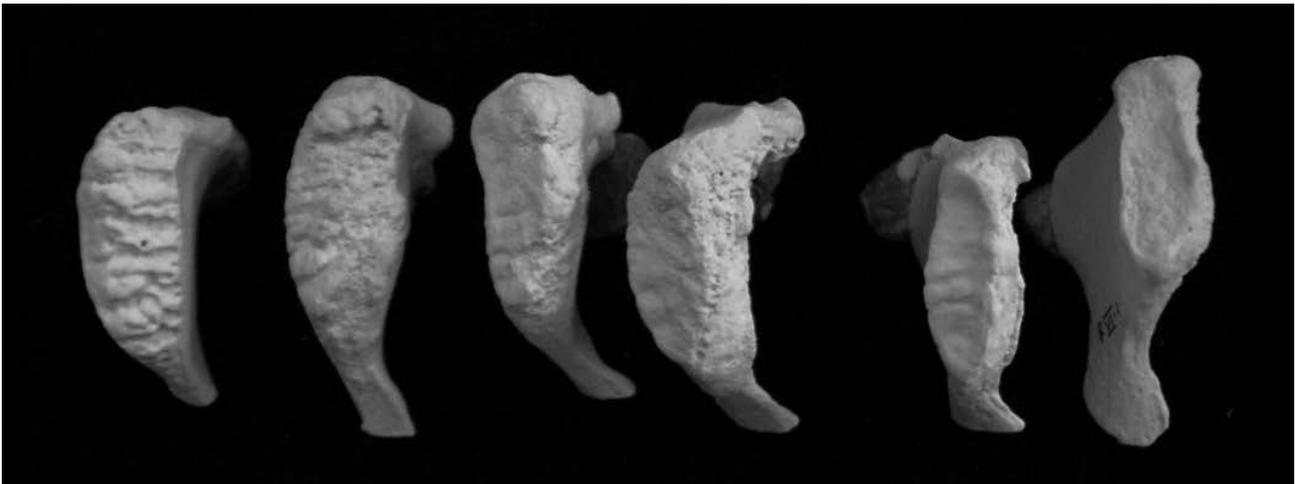


Figure 2. Cast of pubic symphysis to identify age using Suchey Brooks Method (France Casting). Female, from left to right, phase I-1, II-1, III-1, IV-1, V-1, dan VI-1. Average age of phase I to VI in female: 19.4; 25,0; 30.7; 38,2; 48,1; 60,0 year old respectively.

determination (Figure 2).⁶ Fingerprints, dental and medical record, DNA as well as property were used in the postmortem examination. The human remains identified were 2 suicide bombers, one hotel staff, and the remaining were the hotel guests. The number of body parts in the RC hotel was 131 and two headless bodies, two torsos without head and without limbs, one head, soft tissue, a colored toe nail (Figure 3). From the JWM the DVI team recovered four quite intact human remains and 8 body parts consisting of head, two arms fragments, two lower limbs,



Figure 3. Colored toe nail of female human remains

vertebrae and soft tissue. The age range of the victims is from 17 years old to 62 years old. Age determination of the 17 year old resulted from the open coronal suture, unerupted third molar



Figure 4. A mammelon on upper incisors and minimal wear on the dentition indicate youth, the individual was 17 year old.

and unfused occipital synchondrosis as well as minimal dental wear (Figure 4). Dental wear method of Lovejoy was used for age determination.⁷ One fragmentary pubic bone matched stage V of Suchey-Brooks Method, indicating average age of 48.1 years old, close to the biological age of the remains 50 year old, upon reconciliation. The 50 year old victim's age was determined using Suchey-Brooks pubic symphysis matching stage 5 (Figure 2). Untrained eyes,

one was female. Out of the 9 multinational human remains, 3 were of Mongoloid race of Indonesians, while 6 were Caucasian race of New Zealand, Australia, and the Netherland. Ancestry determination of the skull used standard forensic anthropological method and the dentition used the presence or absence of keilokoilomorphy or shovel shape of the upper incisors.^{1,8} The total number individual positively identified was 9 people including:



Figure 5. Maxilla of White Female, 50 year old.

non-dentist or non-forensic anthropologist were misled by the “smallness of the maxilla” (Figure 5), thought it belonged to a child. Note that the teeth have extensive dental work of amalgam fillings, the incisal surfaces of the anterior teeth are worn, two premolars were probably extracted for orthodontic purposes, and only four molars are present instead of six on the maxilla. Extensive dental work is costly, the remains was a high social economic status.

Out of the 9 remains, 8 were males and

1. MTD, white male of 61 year old,
2. GRJM-white male of 55 year old,
3. EM-Mongoloid male of 42 year old,
4. NJV-white male of 38 year old,
5. CAS, white male of 36 year old,
6. DDP-Mongoloid male of 17 year old,
7. PB-white male of 62 year old,
8. EK-white female of 50 year old,
9. NIM-Mongoloid male of 40 year old.

DISCUSSION

Pattern of body fragmentation

The bomb blasts leave different pattern of body fragmentations compared to plane crash, volcanic eruption, earthquake and tsunami. Pattern of body fragmentation indicates decapitation in the remains close to the blast or carrying the bomb in this case. The weakest part of human body is on the neck area where it is merely supported by 7 cervical vertebrae and around the stomach where it is merely supported by two thoracic vertebrae in the posterior part of the internal organs, between the twelve costae and the iliae of the pelvic bone. The bomb blast broke these two areas of human body, on the neck and on the stomach areas, thus separating the head and the body, and the torso from the limbs. The opening of the internal organs causes fast decomposition. Depending on the power of the blast, the head could be fragmented further into small pieces leaving tedious effort to reconstruct the skull and the face.

Forensic anthropology roles in disaster response

Various forensic anthropological cases from many part of the world and in Indonesia portray the anthropological strength in addition to the skeletal biology in solving human identification cases either from disaster or other mishaps.⁹⁻¹⁴ In medicine, a physician Krogman as early as 1962 published extensive literature on the value of human skeleton in forensic medicine, and later revised in Krogman and Iscan in 1986.¹⁵⁻¹⁶ Anthropology has developed various methods and worked on various forensic cases when

personal identity of human remains needed to be identified.^{17,18}

In regards to disaster, the role of forensic anthropology often goes beyond disaster identification during the case. Issues faced by forensic anthropologist often include facing the distraught family members, media looking for news to be released, authorities from the country where their citizens died in the disaster, and society to understand the process of disaster victim identification. This issue is also noted by Sledzik "... forensic anthropology will continue to take on responsibilities that go beyond the technical requirements of remains identification and delve into the management of the scientific response, interaction with family members...".¹⁹ However, family members and friends helped a lot in antemortem data acquisition, despite the invaluable role of forensic anthropology in disaster victim identification. This is also noted by Blau and Ubelaker "... the important role of family and community is paramount, not only as a key source of antemortem information for identification but also their continued involvement in case resolution and commitment to justice and closure".²⁰ Indonesia experiences various cases of disaster but the number of expertise in forensic anthropology is just a few. The course of forensic anthropology is offered in medical school on the health and disaster curricula, but not all medical schools has the expertise of forensic anthropology in their forensic department.

CONCLUSION

Forensic anthropology is a highly specialized part

of biological anthropology often dealing with the identification of fragmented and decomposed human remains.

This field is overlooked in Indonesia. Bomb blasts dismember human bodies and scatter them in to hundred fragments. The closer to the bomb blast, the more fragmented and thrown far are the human remains. Forensic anthropology plays important roles in determining the minimum number of individual, the ancestry, sex, age, leading to the personal identity of the remains.

ACKNOWLEDGEMENT

The author is a member of the National Team of Indonesia's Disaster Victim Identification, and thank Gen.Eddy Saparwoko (ret) and IrJenPol Musaddeq (ret) who recognize forensic anthropology as a highly specialized discipline of human identification in disaster victim. Special thank to my "forensic anthropology guru" Prof. Jane Buikstra of the University of Chicago in the 1990s, who is now at the Arizona State University. I also thank Prof. Susan Anton of New York University for her invitation to share my knowledge of forensic anthropology and had fruitful discussion with the NYU Master students. Thanks to Prof. Laksono Trisnantoro, my colleague at Gadjah Mada University for years of working together as the Block Coordinator of Health System and Disaster where I led practical laboratory and taught Forensic Anthropology. I also thank my forensic pathologists, forensic dentists, and forensic DNA colleagues Arif, Sindhy Malingkas, Aji, Agung, Putut, Purnomo, Hastry, Oktavinda

Savitry, and Tamy in DVI.

REFERENCES

1. Indriati E. Antropologi Forensik. Identifikasi manusia dalam konteks hukum. 2nd ed. Yogyakarta: Gadjah Mada University Press; 2009.
2. Indriati, E. Historical perspectives on forensic anthropology in Indonesia. In: Blau S, Ubelaker DH, editors. Handbook of Forensic Anthropology and Archaeology. California: Left Coast Press, Inc; 2011.p. 115-25.
3. Morgan OW, Tidball-Binz M, van Alphen D. Management of dead bodies after disasters: a field manual for first responders. Washington D.C: PAHO; 2009. Available from: <https://www.icrc.org/eng/assets/files/other/icrc-002-0880.pdf>.
4. INTERPOL. Disaster Victim Identification phases and forms [Internet]. 2013. Available from: <http://www.interpol.int/INTERPOL-expertise/Forensics/DVI-Pages/Forms>.
5. INTERPOL. DVI Guide (new version 2013) [Internet]. 2014. Available from: <http://www.interpol.int/content/download/9158/68001/version/13/file/INTERPOL%20DVI%20GUIDE.pdf>.
6. Brooks ST, Suchey JM. Skeletal age determination based on the os pubis: A comparison of the Ascádi-Nemeskári and Suchey-Books Methods. *Human Evolution*.1990;5:227-38.
7. Lovejoy CO. Dental wear in the Libben population: its functional pattern and role in the

- determination of adult skeletal age at death. *Am J Phys Anthropol.* 1985;68: 47-56.
8. Burns KR. Forensic anthropology training manual. 3rd ed. Prentice Hall: Pearson; 2012.
 9. Rathburn TA, Buikstra JE. Human identification: Case studies in forensic anthropology. Springfield: Charles C. Thomas; 1984.
 10. Steadman DW. Hard evidence: Case studies in forensic anthropology. 2nd ed. Prentice Hall: Pearson; 2009.
 11. Reichs KJ. Forensic osteology. Advances in identification of humans. Springfield: Charles C Thomas Pub; 1998.
 12. Blau S, Ubelaker D. Handbook of forensic anthropology and archaeology. California: Left Coast Press, Inc; 2011.
 13. Indriati E. The roles of forensic anthropology in fetal death investigation. *Berkala Ilmu Kedokteran.* 1999; 31 (3): 181-7.
 14. Indriati E. Penentuan individu pada penggal kepala dengan kongruensi vertebra. *Berkala Ilmu Kedokteran.* 2000; 32 (3): 1147-54.
 15. Krogman WM. The human skeleton in forensic medicine. Springfield IL: Charles C. Thomas; 1962.
 16. Krogman WM, Iscan MY. 2nd ed. The human skeleton in forensic medicine. 2nd ed. Springfield IL: Charles C. Thomas; 1986.
 17. Ubelaker DH. Human skeletal remains: exvacation, analysis, interpretation. Washington: Taraxacum; 1999.
 18. Bass WM. Human osteology: A laboratory and field manual. 5th ed. Missouri: Missouri Archaeological Society; 2005.
 19. Sledzik PS. Forensic anthropology in disaster response. In: Blau S, Ubelaker D. Handbook of forensic anthropology and archaeology. California: Left Coast Press, Inc; 2011. p.374-87.
 20. Blau S, Ubelaker D. Global perspectives on issues in forensic anthropology. In: Blau S, Ubelaker D. Handbook of forensic anthropology and archaeology. California: Left Coast Press, Inc; 2011. pp.509-13.