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A Study On Forensic Anthropology in India

Gayathri Vijayan

B.A. LLB(Hons), IV Year, Saveetha School of Law, Saveetha Institute of Medical and Technical Sciences (SIMATS), Saveetha University, Chennai

Abstract

Forensic anthropology is the study of human remains and bones to help identify victims, determine how they died, and reconstruct the circumstances around their deaths. Forensic anthropologists use their knowledge of human variation, skeletal anatomy, and archaeological techniques to analyze bones and their recovery context. The aim of the study is to analyse whether Forensic anthropology is essential for solving criminal cases involving unidentified human remains and furthermore the objectives include to measure whether the use of technology, such as 3D reconstruction, has improved the accuracy of forensic anthropology. A total of 200 samples were collected. Furthermore, using variables such as age, gender, education, location etc as an independent variable and some of the dependent variables are that forensic anthropologists work with archaeological methods, Forensic anthropology is essential for solving criminal cases involving unidentified human remains, whether the use of technology, such as 3D reconstruction, has improved the accuracy of forensic anthropology, Under forensic anthropology which of the following is not related to it. The research has relied on simple percentages and graphs and secondary data which are referred to with books and articles and research papers. Overall, forensic anthropology is indispensable in modern criminal investigations, particularly in cases of mass disasters or when remains are extensively damaged. The integration of advanced technology has notably enhanced the accuracy of forensic analysis, positioning it as an essential tool in the broader criminal justice process. Future research and continued technological advancements will further elevate the role of forensic anthropology in solving complex criminal cases.

Keywords: Forensic, Skeletons, Archeological remains, 3D reconstruction, victims.

1. Introduction

Forensic anthropology is a branch of anthropology that applies the study of human bones and remains to solve legal and criminal cases. It involves analyzing skeletal remains to determine the identity, age, sex, ancestry, and possible cause of death of individuals. This field is particularly useful in cases where bodies are decomposed, burned, or otherwise unrecognizable, as bones often remain long after soft tissues have decayed. By examining skeletal features, forensic anthropologists can provide critical information to law enforcement, aiding in the identification of missing persons and the resolution of criminal investigations.forensic anthropology plays a crucial role in modern forensic science, contributing to criminal justice by identifying victims of violent crimes, accidents, and mass disasters. It is also instrumental in human rights investigations, helping to uncover the identities of victims of war crimes, genocide, and forced disappearances. As a growing field, forensic anthropology continues to evolve with advancements in technology, making it an essential tool in both criminal justice and humanitarian efforts.

The **aim** of the study is to analyse whether Forensic anthropology is essential for solving criminal cases involving unidentified human remains.

The **Evolution of the topic** is a specialized subfield of physical anthropology that applies the principles and techniques of anthropology to solve legal and criminal cases, particularly those involving unidentified human remains. The origins of forensic anthropology can be traced back to the late 19th and early 20th centuries, as anthropologists began to recognize the potential of their methods in criminal investigations. Early pioneers, like Ales Hrdlicka and Wilton Krogman, played pivotal roles in the development of the field, particularly in identifying skeletal remains. In the mid-20th century, forensic anthropology became more formalized as forensic science grew, with anthropologists being called upon to help law enforcement agencies with human identification and criminal investigations.The field saw significant advancements with the introduction of new technologies in the late 20th and early 21st centuries, such as 3D imaging, DNA. Today, forensic anthropology continues to evolve, integrating cutting-edge scientific techniques with traditional methods of bone analysis. It has become a vital part of modern criminal justice systems, offering unique insights into the identification of unknown victims and contributing significantly to solving crimes. The field now works closely with other forensic experts such as pathologists, odontologists, and entomologists to provide comprehensive analyses of skeletal remains. As the practice grows, it plays an essential role in advancing both the scientific understanding of human remains and the application of anthropology in legal contexts.

The government has taken several **initiatives** to integrate forensic anthropology into the criminal justice system, improve forensic science infrastructure, and ensure better utilization of scientific methods for solving crimes. Some of the key government initiatives in this field include:**National Institute of Forensic Sciences (NIFS)**.Establishment of Forensic Science Laboratories (FSLs) such as the **Central Forensic Science Laboratory (CFSL)** are equipped to analyze skeletal remains and provide assistance in forensic anthropology. **Forensic Science Scheme**, the Indian government has provided funding and infrastructural support to state forensic laboratories to modernize their equipment and improve the quality of forensic investigations. **National Crime Records Bureau (NCRB)**:The **NCRB** plays a crucial role in coordinating and collecting data related to crime investigations across India.

Several **factors influence** the effectiveness and development of forensic anthropology in India: Many forensic laboratories lack the necessary tools and technology, such as 3D imaging or DNA analysis, to perform complex anthropological analysis, A lack of a standardized, nationally recognized protocol for using forensic anthropology in criminal investigations can delay or complicate its application,The rapid pace of technological development in forensic science can create challenges in keeping laboratories and professionals updated with the latest tools,There is a shortage of trained forensic anthropologists in India, limiting the use of advanced techniques in criminal investigations,

Forensic anthropology reflects advancements in both technology and interdisciplinary collaboration, shaping the way this field is applied in criminal justice and human rights investigations. Some key **trends** include:The use of technologies such as 3D imaging, CT scanning, and laser scanning has revolutionized forensic anthropology,The growing use of DNA profiling in forensic anthropology has enhanced the ability to identify individuals from skeletal remains, even in cases of extreme decomposition,Forensic

anthropologists are collaborating more with other forensic specialists, such as forensic pathologists, odontologists, criminologists, and archaeologists,Forensic anthropology is being increasingly used in human rights investigations, particularly in conflict zones and post-disaster scenarios. Experts are helping identify victims of war crimes, genocide, and natural disasters, providing closure for families and accountability for perpetrators,This includes ensuring the respectful handling of human remains, transparency in the forensic process, and protecting the rights of individuals involved in the investigation.

Forensic anthropology is a growing field globally, but its development and application vary significantly across countries. Here's a **comparison** In **Thailand**, forensic anthropology is still emerging, with limited formal education and infrastructure. While there have been some efforts, particularly in disaster response, its application in criminal investigations remains underdeveloped compared to other nations. In **Canada**, forensic anthropology is more established, with specialized academic programs and a growing focus on human rights investigations and disaster victim identification. The country has access to advanced technologies like CT scans and 3D imaging, contributing to the field's development. **Russia**, on the other hand, has limited infrastructure for forensic anthropology, with most forensic cases handled by pathologists or archaeologists. The use of modern technologies is less widespread, and training opportunities in forensic anthropology are rare, with many professionals seeking education abroad. In **Europe**, countries like the United Kingdom, France, and Germany have highly developed forensic anthropology systems, with well-established academic programs and research centers. They utilize cutting-edge technologies, such as 3D imaging, DNA analysis, and virtual autopsy, and play a significant role in humanitarian efforts, such as identifying victims of war crimes and contributing to disaster victim identification (DVI).

OBJECTIVES

- To analyse whether Forensic anthropology is essential for solving criminal cases involving unidentified human remains.
- To measure whether the use of technology, such as 3D reconstruction, has improved the accuracy of forensic anthropology.
- To evaluate the Forensic anthropologists apply archaeological techniques in the examination and analysis of human remains for legal or investigative purposes.

REVIEW OF LITERATURE

Haglund, W. D., & Sorg, M. H. (2011): the review provides foundational work in forensic taphonomy, emphasizing how environmental factors, including temperature and exposure to insects or animals, can drastically alter the rate of decomposition. It focused on examining the postmortem fate of human remains, particularly how decomposition is influenced by environmental factors. And to Explore the stages of decomposition, factors such as temperature, humidity, and animal activity, and how these can influence the rate of decay and contribute to estimating time of death. The study of taphonomy is integral to the determination of time of death and the identification of bodies in diverse environmental settings, including homicide investigations, mass fatalities, and disaster recovery operations.

Byers, S. N. (2013): author's textbook provides an introduction to the principles of forensic anthropology. The work covers topics such as skeletal trauma analysis, age and sex determination, and the use of forensic

anthropology in criminal investigations. To introduce students and professionals to the basic principles of forensic anthropology and its role in criminal investigations.And to Discuss the methods for estimating biological profiles using skeletal remains.Explain the process of skeletal trauma analysis. In the end Forensic anthropology plays a pivotal role in criminal investigations, particularly in identifying deceased individuals when conventional identification methods (such as fingerprints or facial recognition) are not available.

Schultz, M., & Henschke, H. (2014): explores the crucial role that forensic anthropology plays in identifying victims of mass disasters. They discuss how modern technological advances, such as DNA analysis and radiography, have been integrated with traditional anthropological methods to improve the accuracy and speed of victim identification in large-scale events like natural disasters, terrorist attacks, or mass fatalities. Investigate plays a critical role in forensic anthropology in identifying victims in mass disaster scenarios. Examine the use of forensic anthropological techniques, such as skeletal analysis, in disaster victim identification. The integration of forensic anthropology with these technologies has revolutionized mass fatality investigations, allowing for more accurate and faster identification of victims.

Symes, S. A. (2016): author examines the role of forensic anthropology and pathology in mass fatality events, such as natural disasters and terrorist attacks. It discussed the coordination between different forensic experts and the challenges faced in large-scale recovery and identification efforts. It explores the process of coordinating recovery operations across multiple forensic disciplines. Address the role of forensic anthropology in victim identification and how it contributes to the overall recovery efforts in mass fatality cases. This paper emphasizes the importance of forensic anthropology in disaster victim identification and provides guidance on working in large-scale recovery operations.

Traithepchanapai (2016): Forensic anthropology is an increasingly developing discipline born about a century ago with the objective to contribute the knowledge of bone biology and physical anthropology to the emerging needs of the court of law. In Thailand by providing information and practice that can help forensic practitioners to apply existing methods in forensic cases and mass disasters. It is learned the emerging need for positive identification in medicolegal settings will lead to rapid advances in education, training and professional engagement of anthropologists from the forensic departments and the law enforcement agencies in Thailand.

Rogers, T. L. (2017): paper reviews methods for determining ancestry using skeletal markers, particularly cranial and dental features. This research advanced the understanding of how forensic anthropologists can use skeletal remains to determine ethnic background, aiding in human identification. It explores the various methods used to determine the ancestry of individuals based on skeletal remains and their effectiveness in forensic applications.It is to discuss the limitations and challenges in using skeletal markers for ancestry determination in forensic anthropology. This research has practical applications in criminal investigations and mass disaster victim identification, aiding in narrowing down the potential ethnic background of unidentified remains.

Ousley, S. D., & Jantz, R. L. (2017): analyzed cranial morphological differences between Eastern and Western European populations, offering a framework for identifying geographic origins from skeletal

remains. Their research contributes to the understanding of ancestry estimation. Aims to identify and differentiate cranial morphological traits in Eastern and Western European populations, offering a reliable method for determining geographic origins from skeletal remains. Examine the cranial features that distinguish Eastern and Western European populations and Assess the effectiveness of cranial morphology in forensic ancestry estimation. Overall Significant differences in cranial shape and structure exist between Eastern and Western European populations, which can be identified through detailed morphometric analysis.

Larsen, C. S. (2017): explores how bioarchaeologists and forensic anthropologists interpret behaviors and life histories from human skeletal remains. Topics include diet, health, trauma, and disease. Aim to explore how skeletal remains can be used to interpret past human behaviors, lifestyles, and health conditions. Is to Examine the link between diet, health, and lifestyle as revealed by skeletal analysis and how these factors contribute to forensic investigations. Skeletal analysis can provide significant insights into an individual's diet, physical activity, and overall health.The incorporation of bioarchaeological principles has enhanced the understanding of individuals beyond mere identification, helping to build a broader narrative of their lives and behaviors.

Terry, R. G., & Ubelaker, D. H. (2018): author discusses methods for estimating the age of individuals based on skeletal remains. To evaluate and refine methods for estimating age based on skeletal remains, focusing on both juvenile and adult age determination techniques. Their objective was to assess the reliability and accuracy of these age estimation methods across different populations and age groups. The findings underscore the importance of refining these techniques to improve their applicability in forensic investigations and the creation of biological profiles, especially in criminal cases where age estimation is crucial for identifying individuals.

Rogers, T. L., & Saunders, S. (2018): This study explores how forensic anthropology is applied in human rights investigations, particularly in the identification of victims of political violence and mass graves. It explores the application of forensic anthropology in human rights investigations, particularly in identifying victims of political violence and mass graves. Their study highlights case studies from international contexts to demonstrate the effectiveness of forensic anthropological methods in the recovery and identification of individuals in politically sensitive or conflict zones. The objective was to show how forensic anthropology can be integral to documenting human rights violations and contributing to justice for victims of mass violence.

Neha Baryah & ors. (2019): This comprehensive review focuses on the status and development of forensic anthropology in India and emphasises the need for its recognition as a specialty of significance. It conducted a comprehensive review focusing on the development and status of forensic anthropology in India. The authors emphasize the need for forensic anthropology to be recognized as a specialized discipline of significance, similar to its recognition in developed countries. Their objective was to highlight the current state of forensic anthropology in India and the challenges the country faces in its implementation, as well as the need for further research and development to align with global standards in the field.

Vaswani (2019): This study examines that there is a need for further updated and complete information on the development of forensic anthropology in India, including its importance and its current status.examines the development of forensic anthropology education and training in India. The study aims to provide updated and comprehensive information on the current status of forensic anthropology in India, focusing on its importance and the gap in education and training programs. It was to argue for the establishment of specialized forensic anthropology training programs to improve the country's ability to handle forensic cases and meet the demands of law enforcement, thereby raising the profile of forensic anthropology as an essential field of study.

Latham, K. E., & Moore, M. K. (2019): review new methodologies and practices in forensic anthropology for mass fatality events, focusing on large-scale identification efforts. Their study aims to assess the role of forensic anthropology in such events and to evaluate the innovative techniques used in skeletal analysis, such as DNA analysis and advanced imaging technologies. It highlights the evolving role of forensic anthropology in disaster victim identification and provides insights into how new technologies and methodologies can enhance the efficiency and accuracy of these efforts, especially in mass fatality situations.

O'Rourke, S. M., & Brown, S. (2021): author explores the use of 3D imaging technologies, such as CT scans and MRI, in forensic anthropology, focusing on their ability to provide detailed, non-destructive analyses of skeletal remains. Their study highlights how these advanced imaging techniques enhance the ability to identify trauma, fractures, and other forensic markers that may be critical for human identification and case resolution. It evaluates the future potential of 3D imaging technologies in forensic anthropology, offering a more precise and efficient method for analyzing human remains and supporting forensic investigations.

Jayaprakash PT (2021): emphasizes the need to expand research and training in forensic anthropology in India to improve the identification of human remains using globally recognized anthropological methods. The author discusses the progress made in the field in India, particularly in relation to individual identification, and stresses the importance of further developing expertise and infrastructure in the country. Mainly to assess the current state of forensic anthropology in India, identify gaps in training and research, and highlight the practical relevance of implementing internationally accepted methods for forensic identification, which could foster further growth and specialization in the field.

Rodriguez, W., & Bass, W. M. (2021): This text provides an in-depth analysis of the stages of decomposition, from fresh body to skeletonization. provide a detailed analysis of the stages of decomposition of human remains, from the initial fresh body stage to complete skeletonization. Their study also explores how environmental factors such as temperature, humidity, and exposure to animals can influence the rate of decomposition, which can be used to estimate the time of death. The objective was to offer critical insights into forensic taphonomy, laying the foundation for understanding how decomposition occurs in different environmental settings and its significance in estimating time of death, which is crucial for forensic investigations.

Ubelaker, D. H. (2022): Author provides an overview of the scientific principles behind forensic anthropology. It provides an overview of the scientific principles of forensic anthropology, focusing on methods for identifying human remains. The study covers a wide range of techniques including the analysis of dental records, skeletal characteristics, and DNA. The aim was to highlight the importance of these methods in human identification, examining the challenges and advancements in forensic anthropology. The article provides a comprehensive review of the various tools and techniques forensic anthropologists use to create biological profiles, particularly in criminal investigations.

Schenk, S., & Preissler, A. (2022): discuss the role of forensic anthropology in disaster response, emphasizing its use in identifying victims in large-scale disasters. They review case studies and technological advances.They focus on the evolution of forensic anthropology in disaster response, emphasizing its role in identifying victims of large-scale disasters. Their study reviews case studies and the technological advancements that have shaped the field, including the integration of DNA analysis and radiographic methods. The objective was to evaluate the changing role of forensic anthropology in disaster response and how advancements in technology have improved the identification of disaster victims, underscoring the importance of these techniques in saving lives and providing closure in tragic events.

Sauer, N. J. (2023): author reviews the role of forensic anthropology in human remains identification, emphasizing the importance of osteological analysis for determining biological profiles. reviews the role of forensic anthropology in the identification of human remains, emphasizing osteological analysis for determining biological profiles. The study highlights practical applications of forensic anthropology in criminal investigations, providing case studies that demonstrate its value in real-world scenarios. The objective was to emphasize the essential role of forensic anthropologists in human remains identification and to review the challenges, advancements, and practical applications of osteological analysis in both legal and investigative contexts.

Krogman, W. M., & Iscan, M. Y. (2023): author addresses how forensic anthropologists use skeletal features to identify age, sex, ancestry, and stature, which are crucial for establishing a biological profile. offer a comprehensive guide to analyzing human skeletal remains, focusing on the identification of age, sex, ancestry, and stature, which are critical for establishing a biological profile. Their foundational text is considered a classic in forensic anthropology. It was to provide a detailed and systematic approach to skeletal analysis, offering forensic anthropologists the tools and methods necessary for human identification. By focusing on skeletal features, the authors provide an essential resource for those in forensic medicine, emphasizing the importance of these characteristics in creating accurate biological profiles for legal and investigative purposes.

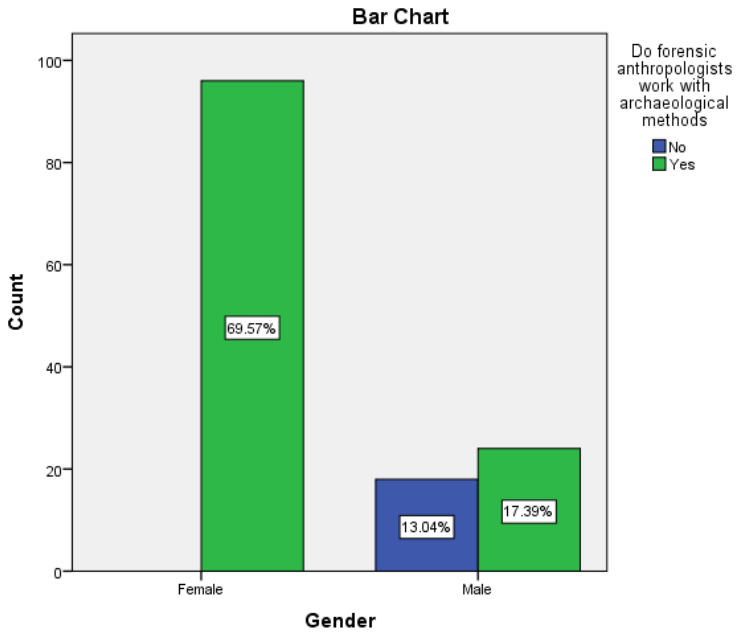
METHODOLOGY

The study used both primary and secondary data. Primary data a total of 200 samples have been taken out of which is taken through simple sampling and the sampling frame taken by the researcher is empirical with the structured questionnaire. By using age, gender, education, location etc as an independent variable and some of the dependent variables are that forensic anthropologists work with archaeological methods, Forensic anthropology is essential for solving criminal cases involving unidentified human remains, whether the use of technology, such as 3D reconstruction, has improved the accuracy of forensic

anthropology, Under forensic anthropology which of the following is not related to it. And I have used Simple percentages and graphs and secondary data which are referred to with books and articles and research papers etc.

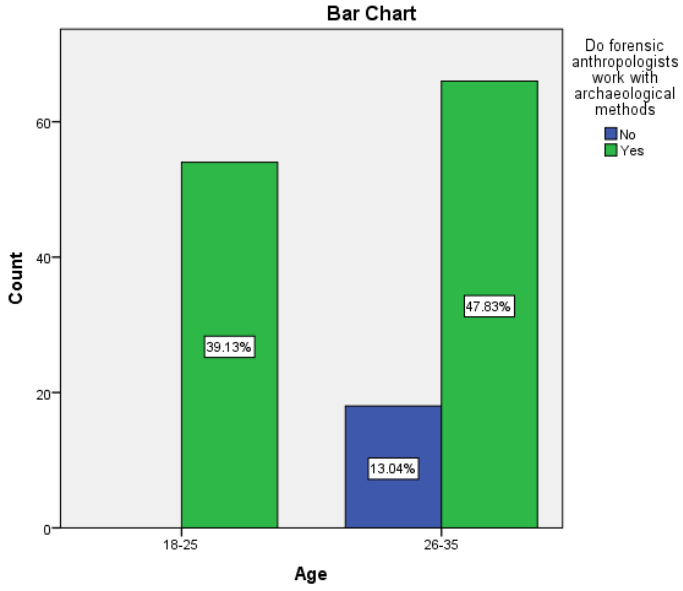
ANALYSIS

FIGURE 1



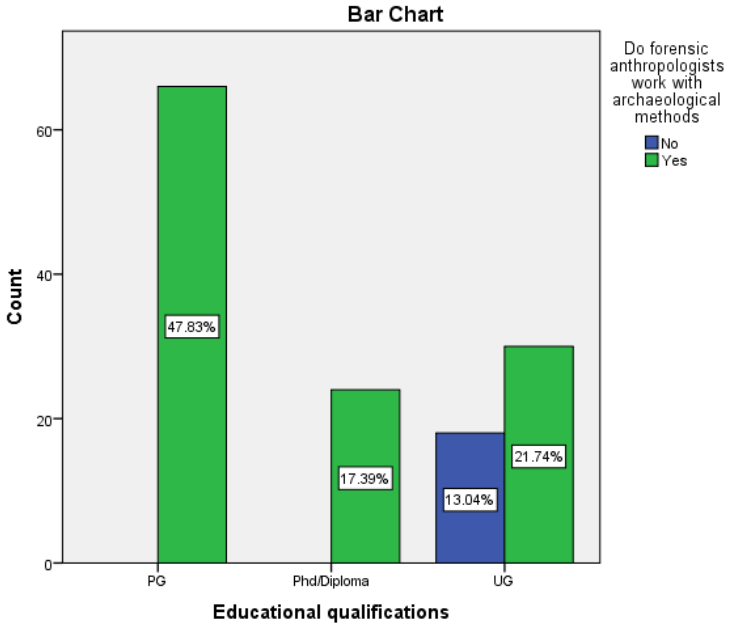
LEGEND: figure 1 represents the difference between gender by do forensic anthropologists work with archeological methods.

FIGURE 2



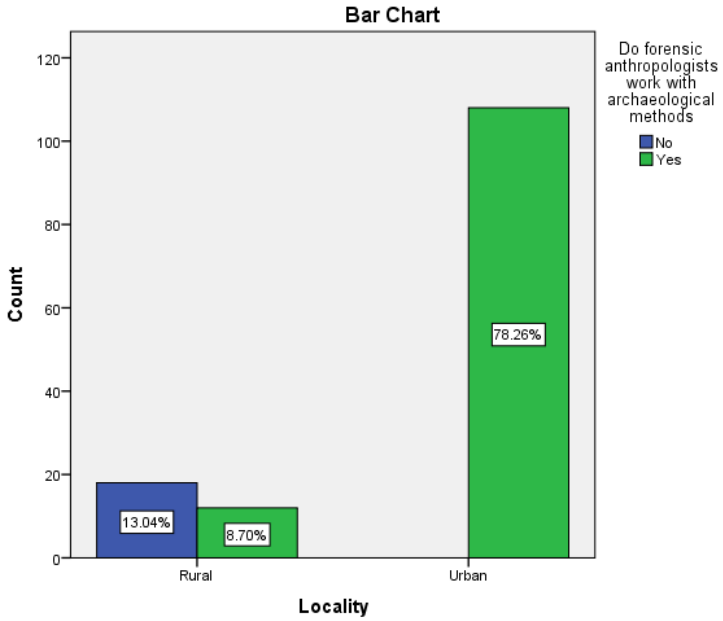
LEGEND: figure 2 represents the difference between Age by do forensic anthropologists work with archeological methods.

FIGURE 3



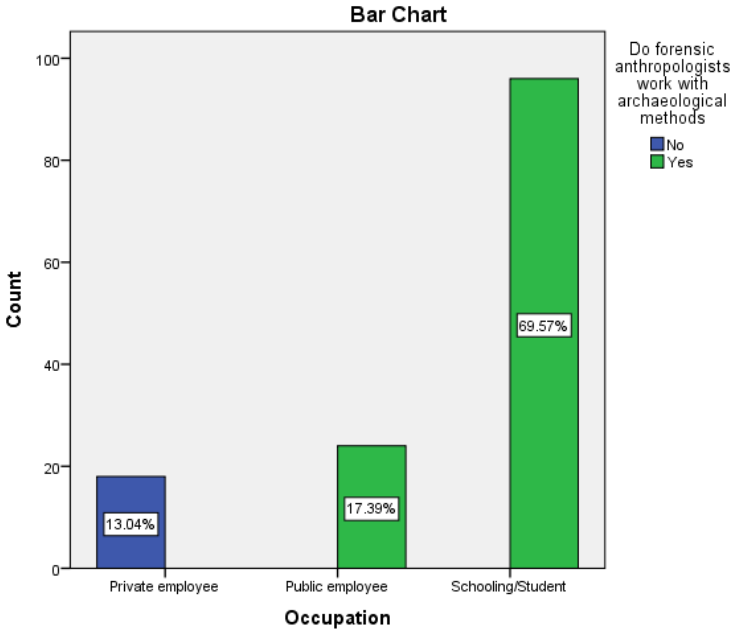
LEGEND: figure 3 represents the difference between educational qualification by do forensic anthropologists work with archeological methods.

FIGURE 4



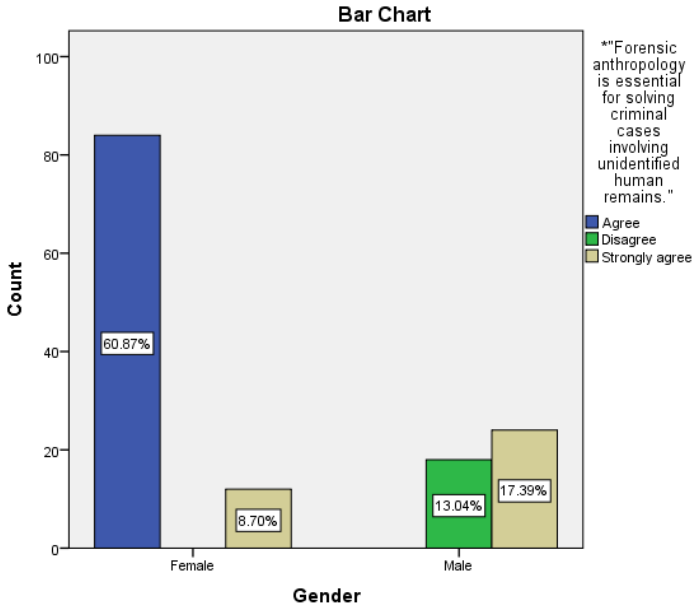
LEGEND: figure 4 represents the difference between locality by do forensic anthropologists work with archeological methods.

FIGURE 5



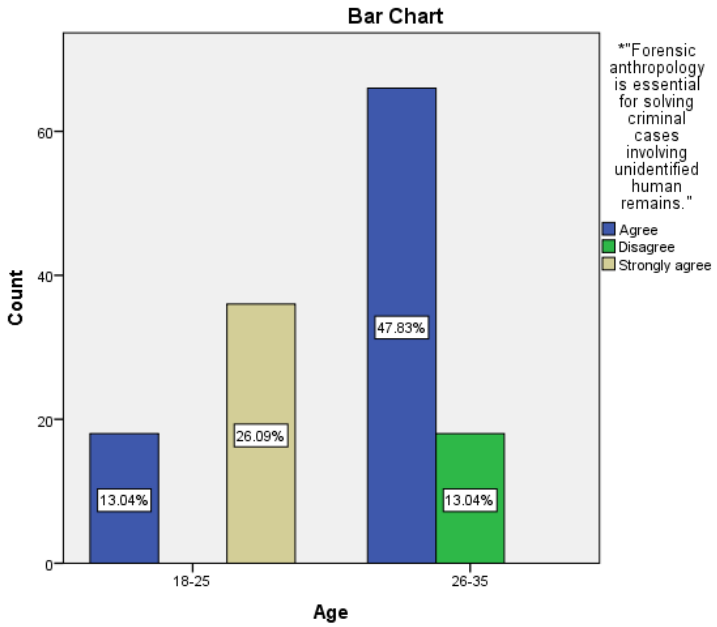
LEGEND: figure 5 represents the difference between locality by do forensic anthropologists work with archeological methods.

FIGURE 6



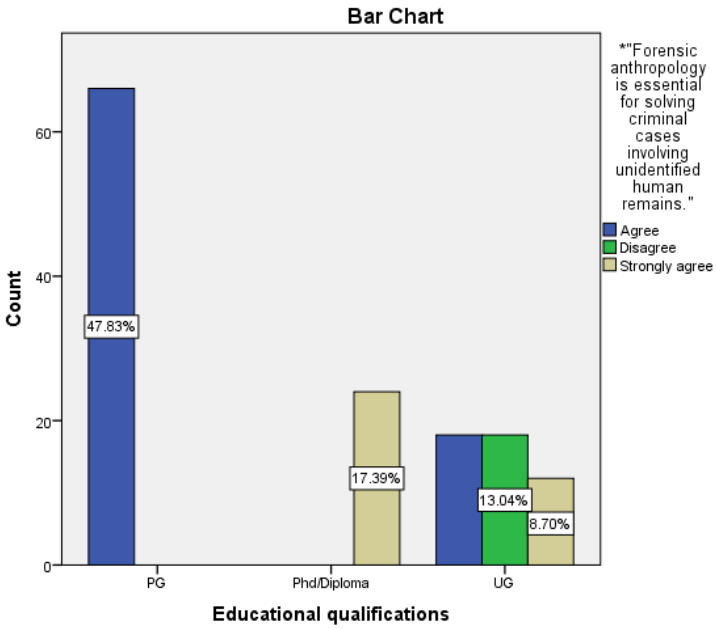
LEGEND: figure 6 represents the difference between Gender by forensic anthropology is essential for solving criminal cases involving unidentified human remains.

FIGURE 7



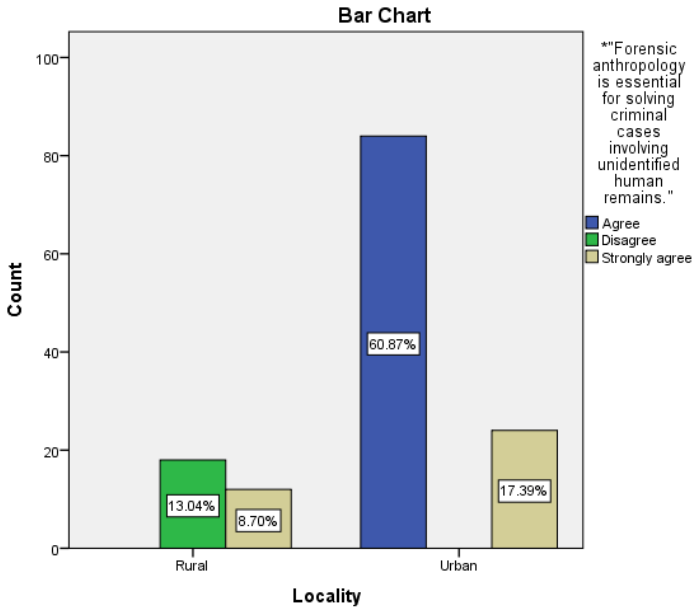
LEGEND: figure 7 represents the difference between age by forensic anthropology is essential for solving criminal cases involving unidentified human remains.

FIGURE 8



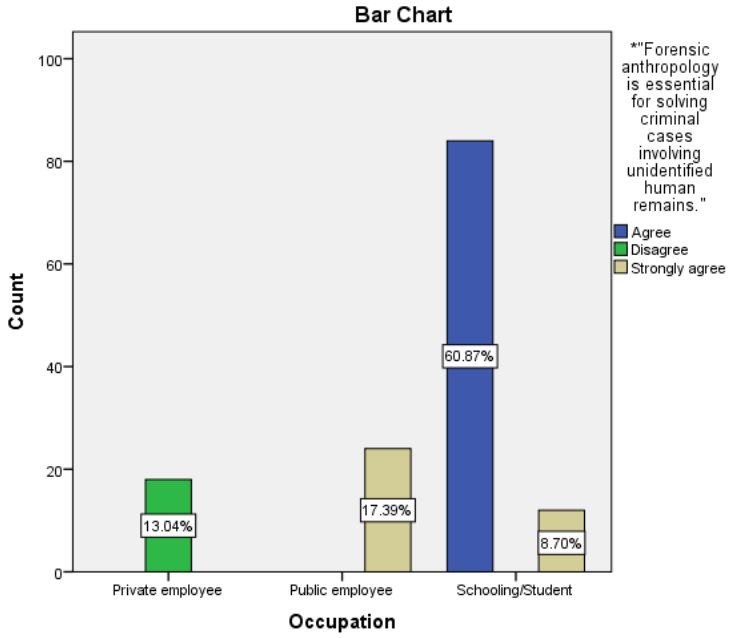
LEGEND: figure 8 represents the difference between educational qualifications by forensic anthropology is essential for solving criminal cases involving unidentified human remains.

FIGURE 9



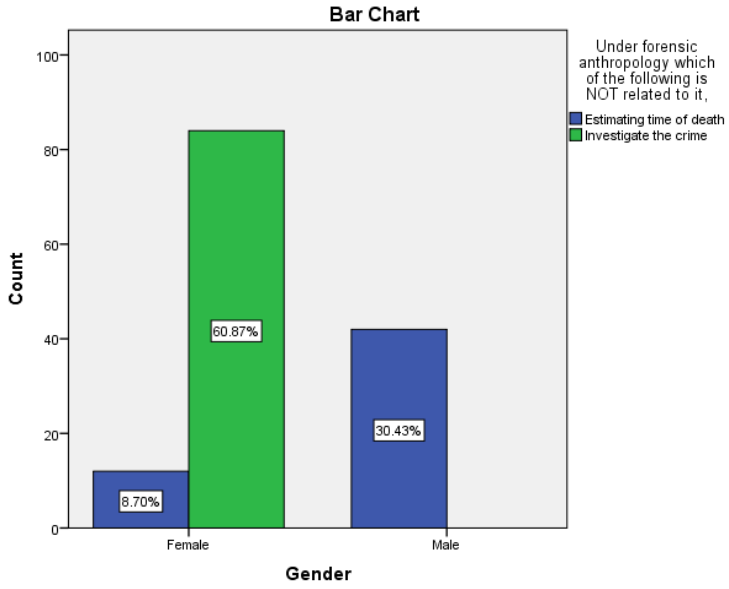
LEGEND: figure 9 represents the difference between locality by forensic anthropology is essential for solving criminal cases involving unidentified human remains.

FIGURE 10



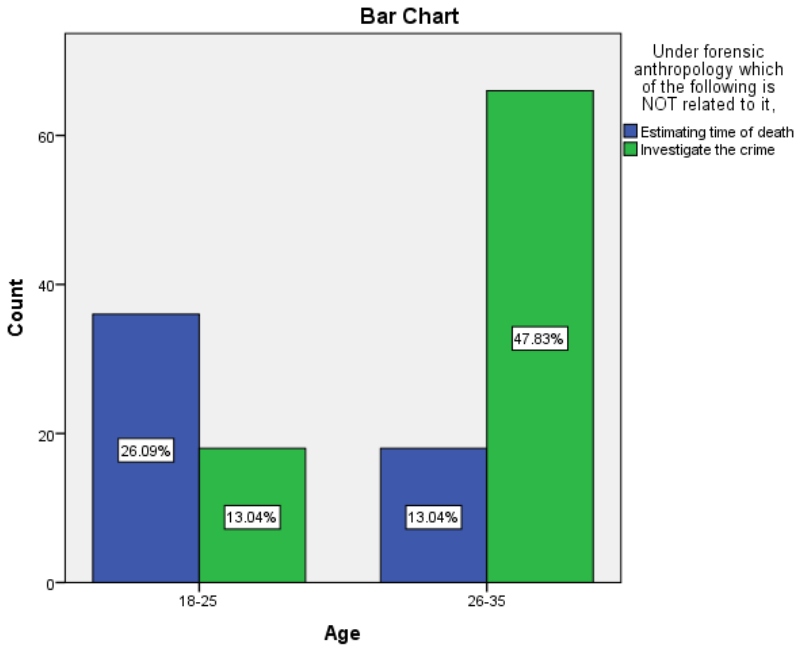
LEGEND: figure 10 represents the difference between locality by forensic anthropology is essential for solving criminal cases involving unidentified human remains.

FIGURE 11



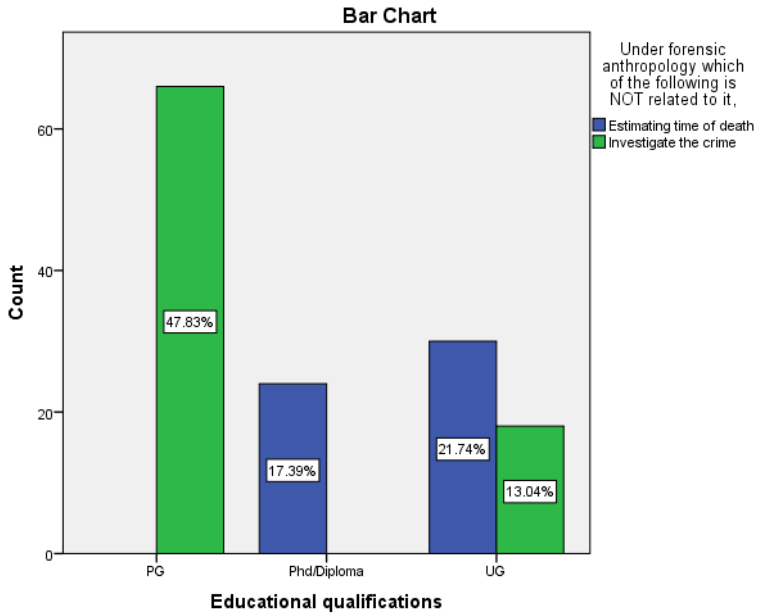
LEGEND: figure 11 represents the difference between gender by which of the following is not related to forensic anthropology.

FIGURE 12



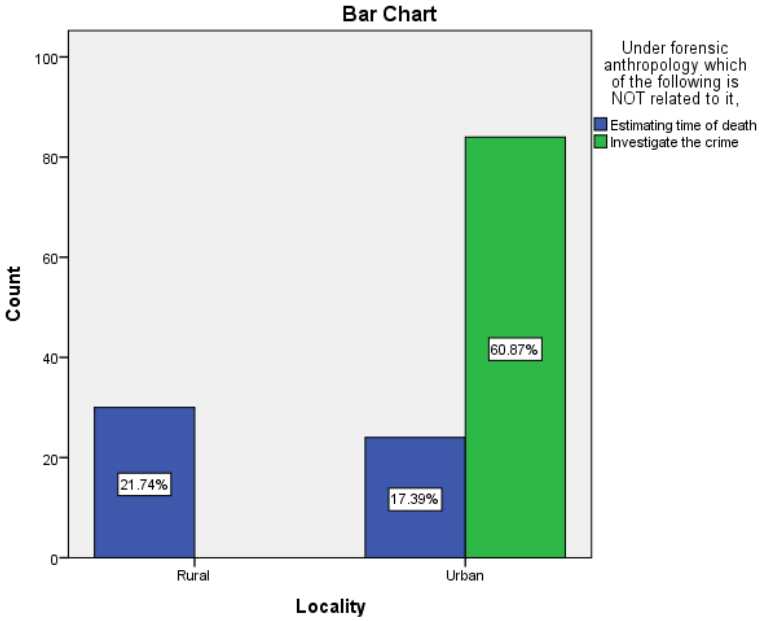
LEGEND: figure 12 represents the difference between age by which of the following is not related to forensic anthropology.

FIGURE 13



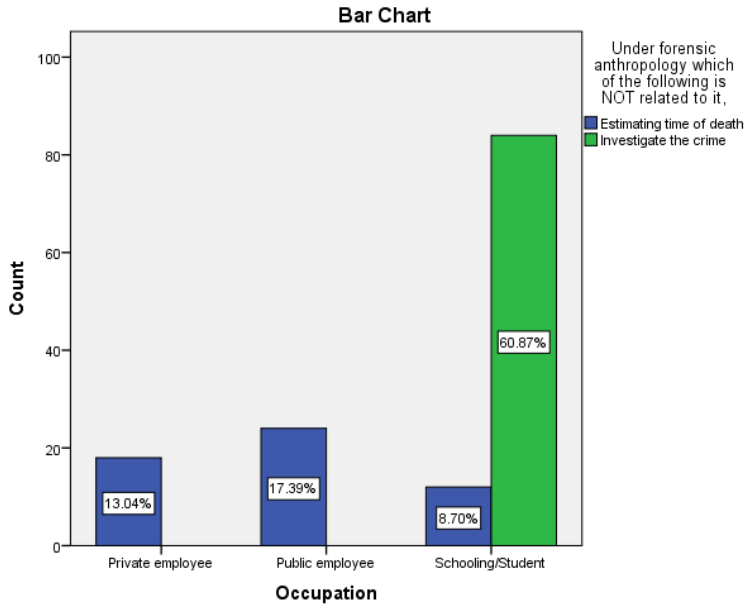
LEGEND: figure 13 represents the difference between educational qualification by which of the following is not related to forensic anthropology.

FIGURE 14



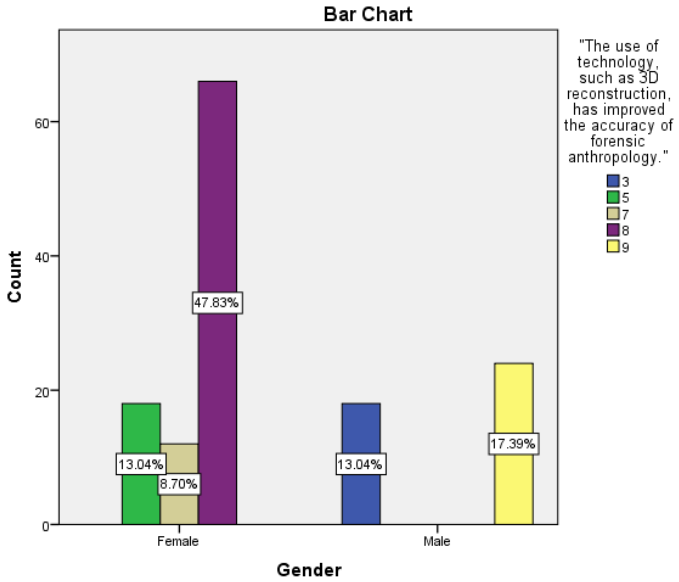
LEGEND: figure 14 represents the difference between Locality by which of the following is not related to forensic anthropology.

FIGURE 15



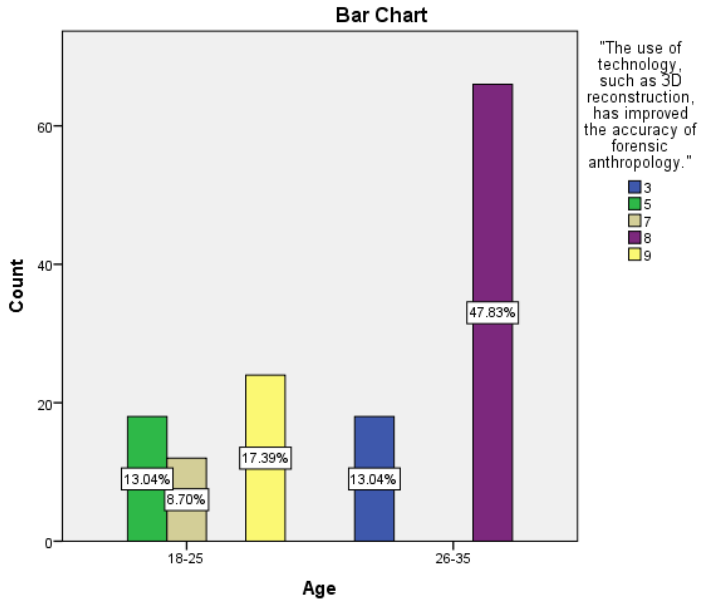
LEGEND: figure 15 represents the difference between Occupation by which of the following is not related to forensic anthropology.

FIGURE 16



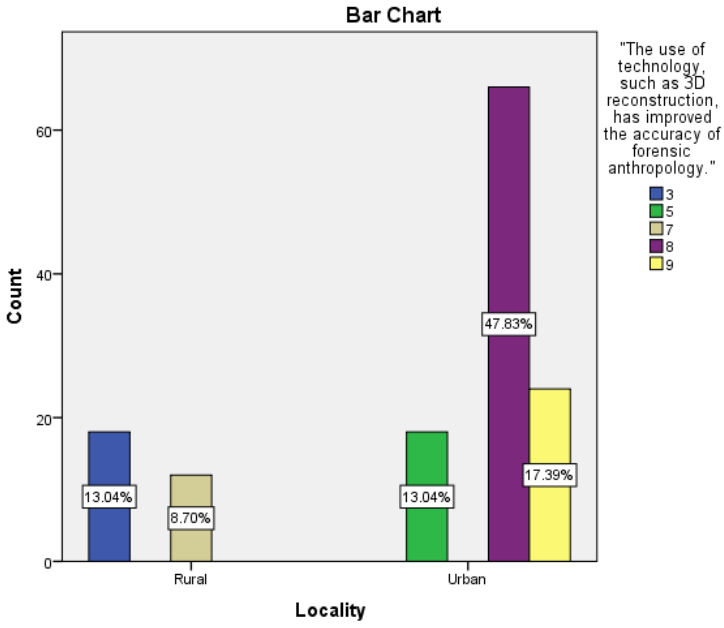
LEGEND: figure 16 represents the difference between gender by the uses of 3D technology in forensic anthropology has improved the accuracy level.

FIGURE 17



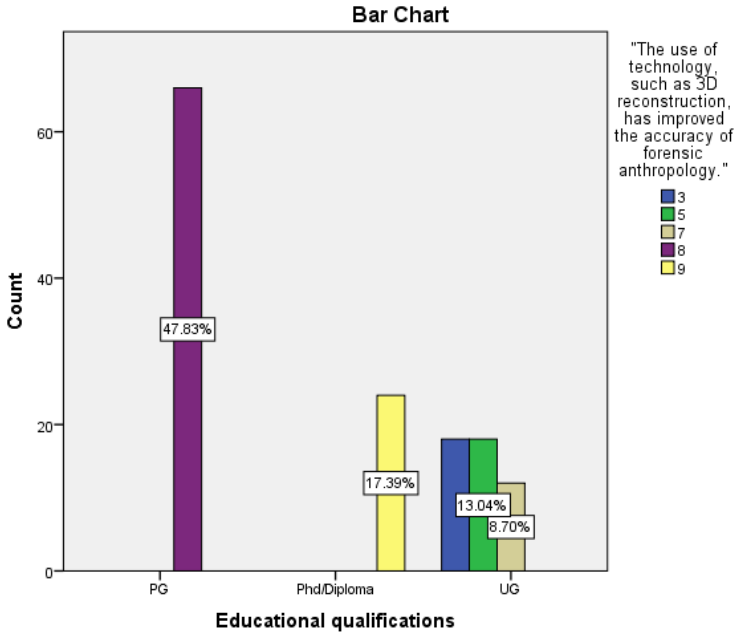
LEGEND: figure 17 represents the difference between age by the uses of 3D technology in forensic anthropology has improved the accuracy level.

FIGURE 18



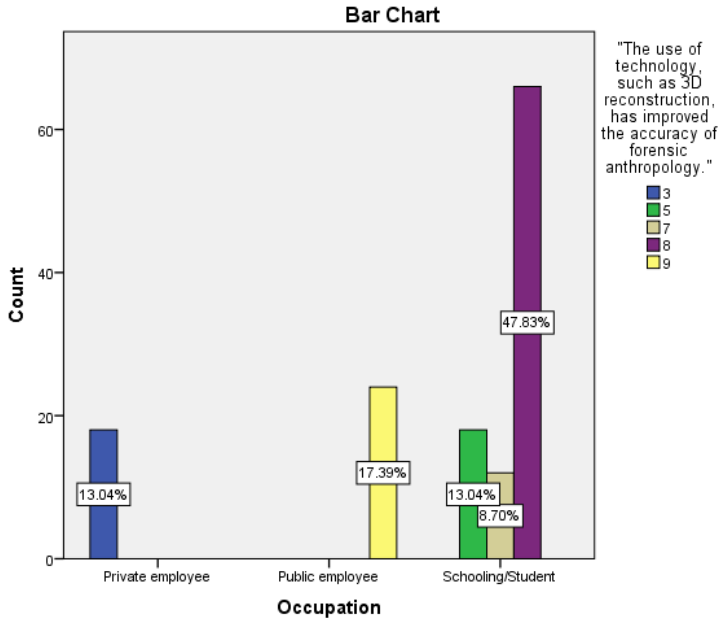
LEGEND: figure 18 represents the difference between locality by the uses of 3D technology in forensic anthropology has improved the accuracy level.

FIGURE 19



LEGEND: figure 19 represents the difference between educational qualifications by the uses of 3D technology in forensic anthropology has improved the accuracy level.

FIGURE 20



LEGEND: figure 20 represents the difference between occupation by the use of 3D technology in forensic anthropology has improved the accuracy level.

RESULTS

For fig 1 Females gave their 69.57% of response in favour of Yes for forensic anthropologists work with archaeological methods. **For fig 2** 26-35 aged people gave their 47.83% of response in favour of Yes for forensic anthropologists work with archaeological methods. **For fig 3** those who are pursuing PG gave their 47.83% of response in favour of Yes for forensic anthropologists work with archaeological methods. **For fig 4** People who are living in urban areas gave their 78.26% of response in favour of Yes for forensic anthropologists work with archaeological methods. **For fig 5** Students gave their 69.57% of response in favour of Yes for forensic anthropologists work with archaeological methods. **For fig 6** Females gave their 60.87% response in favour of agreeing for solving criminal cases involving unidentified human remains. **For fig 7** 26-35 aged people 47.83% gave their response in favour of agreeing to solving criminal cases involving unidentified human remains. **For fig 8** those who are pursuing PG gave their 47.83% gave their response in favour of agreeing to solving criminal cases involving unidentified human remains. **For fig 9** People who are living in urban areas gave their 60.87% response in favour of agreeing to solving criminal cases involving unidentified human remains. **For fig 10** Students gave their 60.87% of response in favour of agreeing to solving criminal cases involving unidentified human remains. **For fig 11** Females gave their 60.87% of response in favour of investigating the crime as not a process of forensic anthropology. **For fig 12** 26-35 aged people gave their 47.83% of response in favour of investigating the crime as not a process of forensic anthropology. **For fig 13** those who are pursuing PG gave their 47.83% of response in favour of investigating the crime as not a process of forensic anthropology. **For fig 14** People who are living in urban areas gave their 60.87% of response in favour of investigating the crime as not a process of forensic anthropology. **For fig 15** Students gave their 60.87% of response in favour of investigating the crime as not a process of forensic anthropology. **For fig 16** Females gave their 47.83% of response in favour for the use of technology as 3D reconstruction has improved the accuracy of forensic anthropology. **For fig 17** 26-35 aged people gave their 47.83% of response in favour of use of technology as 3D reconstruction has improved the accuracy of forensic anthropology. **For fig 18** People who are living in urban areas 47.83% in favour of the use of technology as 3D reconstruction has improved the accuracy of forensic anthropology. **For fig 19** those who are pursuing PG gave their 47.83% of response in favour for the use of technology as 3D reconstruction has improved the accuracy of forensic anthropology. **For fig 20** Students gave their 47.83% of response in favour of the use of technology as 3D reconstruction has improved the accuracy of forensic anthropology.

DISCUSSION

For fig 1 Females are more likely to support the idea that forensic anthropologists work with archaeological methods. This could be because women, in general, may be more engaged with interdisciplinary fields like forensic anthropology and archaeology, recognizing how these areas overlap. **For fig 2** Individuals in this age group show moderate support, possibly because they are in a phase where they are still learning about or developing an understanding of how forensic anthropology can link to archaeology. While they may recognize its importance, they may not yet have a deep understanding of how the two fields collaborate in practice. **For fig 3** Postgraduate students show a moderate response, which could suggest that while they are familiar with advanced topics in their field, they may not always associate forensic anthropology with archaeological methods. Their focus might be more on specific areas within anthropology, leading to a more neutral stance on the relationship between the two. **For fig 4** Urban residents tend to show strong support for forensic anthropology working with archaeological methods.

This could be because urban areas often have better access to educational institutions, media, and public discussions about forensic science, which makes these concepts more familiar and accepted in these communities. **For fig 5** Students show a higher level of agreement, likely because they are exposed to interdisciplinary subjects like forensic anthropology and archaeology in their education. As they are in the learning phase, they are more open to understanding how these fields overlap, making them more likely to agree with the idea. **For fig 6** Females tend to support forensic anthropology in solving criminal cases involving unidentified human remains. This response might reflect a broader empathy or interest in the justice system, particularly in how forensic science can be used to solve crimes and bring closure to families of victims. **For fig 7** This age group shows a moderate level of agreement, which could be because they recognize the importance of forensic anthropology in criminal cases but may not fully understand its applications. They are likely at a stage where they are still learning or forming their opinions on how forensic methods fit into crime. **For fig 8** Postgraduate students show a moderate agreement, likely due to their academic background, which might focus on more theoretical aspects of forensic anthropology rather than practical applications in criminal cases. They may recognize its potential but are not yet fully immersed in how it is applied in real-world scenarios. **For fig 9** Urban dwellers show a moderate level of agreement, which suggests that they may be more aware of forensic science and its role in criminal investigations. However, their understanding might be shaped by media and public exposure, which can sometimes oversimplify the role of forensic anthropology in crime-solving. **For fig 10** Students show a moderate level of support, reflecting their awareness of forensic anthropology through their education and the media. They likely understand its importance in solving criminal cases but may not yet have in-depth knowledge of how it works in practice. **For fig 11** Females tend to agree more with the idea that investigating crime is not strictly a process of forensic anthropology. This could suggest that they recognize the broader scope of criminal investigations, where forensic anthropology is just one tool among many other methods used in solving crimes. **For fig 12** People in this age group also show moderate agreement with the idea that forensic anthropology is not always central to crime investigations. This could reflect a general understanding that criminal investigations often involve multiple fields, and forensic anthropology may only be needed in certain circumstances, such as identifying human remains. **For fig 13** Postgraduate students' moderate response suggests they understand that forensic anthropology is not always necessary in every criminal investigation. Their response could be influenced by their academic focus, where they may see forensic anthropology as a specialized field used only in specific types of cases. **For fig 14** Urban residents show moderate agreement, perhaps because they understand that crime investigations usually rely on a variety of methods, including police work, criminal psychology, and other forensic sciences. Forensic anthropology is seen as important, but not always central to every investigation. **For fig 15** Students tend to agree that crime investigation does not always involve forensic anthropology. This might reflect their understanding that forensic anthropology is typically used in specific cases, such as those involving human remains, and is not part of every investigation. **For fig 16** Females show a moderate response to the idea that 3D reconstruction technology improves forensic anthropology. This suggests that while they recognize the role of technology, they may not fully understand how specific technological tools are applied within the field of forensic anthropology. **For fig 17** Individuals in this age group show moderate support for the use of technology in forensic anthropology. They are likely familiar with technological advances but may not fully appreciate how tools like 3D reconstruction impact the accuracy of forensic investigations, particularly if they have limited exposure to the field. **For fig 18** Urban residents show a moderate level of agreement with the use of 3D reconstruction

technology in forensic anthropology. This could be because people in urban areas have greater access to information about modern technologies and are aware of how they improve accuracy in various fields, including forensic science. **For fig 19** Postgraduate students show moderate agreement with the idea that 3D reconstruction improves the accuracy of forensic anthropology. Their academic background likely exposes them to the role of technology, but they may not yet see it as a primary tool in forensic anthropology unless they are directly working in the field. **For fig 20** Students show a moderate response to the use of 3D technology in forensic anthropology. While they may be aware of technological advancements, they might not have enough exposure to understand fully how these technologies are used to enhance accuracy in forensic investigations.

LIMITATIONS

A study on forensic anthropology in India faces several limitations, which hinder its growth and application within the country including Insufficient Infrastructure and Resources limits the ability to perform in-depth and accurate investigation, Research in forensic anthropology in India is limited due to insufficient funding and government support. As a result, the field lacks substantial academic and applied research that could help improve methodologies and practices. Most forensic professionals in India receive training in broader forensic science fields, which may not fully equip them with the expertise required for detailed skeletal analysis or the use of advanced technologies.Forensic anthropology is still not widely recognized as a crucial part of the criminal justice system in India. In many cases, law enforcement and legal professionals may not prioritize forensic anthropology when investigating crimes involving human remains, relying more on traditional forensic methods.

SUGGESTION

To overcome the limitations of forensic anthropology in India and enhance its effectiveness in both criminal justice and humanitarian efforts, several steps can be taken like,India should introduce more specialized courses and degree programs in forensic anthropology at universities and institutions, ensuring a strong academic foundation.The government should invest in state-of-the-art forensic laboratories equipped with advanced technologies.India should develop and implement clear legal guidelines for the use of forensic anthropology in investigations especially in humanitarian basis.Address Ethical and Cultural Sensitivities,Improve Interdisciplinary Collaboration,Create a National Forensic Anthropology Database.

CONCLUSION

Forensic anthropology in India, despite its potential to play a crucial role in criminal investigations and humanitarian efforts, faces significant challenges including insufficient infrastructure, limited research, inadequate specialized training, and a lack of legal recognition. These limitations hinder the field's growth and its integration into the criminal justice system. However, by implementing targeted reforms such as specialized education programs, government investment in forensic infrastructure, the development of clear legal guidelines, and fostering interdisciplinary collaboration, India can enhance the effectiveness of forensic anthropology. Additionally, addressing ethical and cultural sensitivities and creating a national database for forensic anthropology will further strengthen its role in both law enforcement and humanitarian efforts. With these improvements, forensic anthropology can become a vital tool in solving crimes, identifying victims, and contributing to justice in India.

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