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ORIGINAL ARTICLE

To Determine the Outcome of Exhumation in Pakistan

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ABSTRACT

Background: Exhumation, a delicate process involving the examination of deceased bodies, serves various purposes such as investigating homicides, suicides, and DNA analysis.

Methods: This retrospective cohort study, conducted from January to July 2023 at Gambat Medical College, Pakistan, utilized a convenience sampling technique with a sample size of 377 determined by WHO guidelines. Data on exhumed cases were collected using structured forms and analyzed for demographic characteristics, condition of bodies, and causes of death.

Results: The study included predominantly male individuals (72.1%) with a mean age of 39.36 years, primarily from urban areas (68.4%). Reasons for exhumation were homicide (69.2%), suicide (19.1%), and DNA analysis (11.7%). Males were more common in younger age groups and identifiable conditions, with varying causes of death including firearm injuries (22.0%) and blunt injuries (16.7%).

Conclusion: Exhumation outcomes in Pakistan reveal demographic trends, varying causes of death, and success rates. Findings emphasize the need for culturally sensitive forensic practices and highlight regional disparities in methods of homicide. Further research incorporating broader contexts is essential for comprehensive understanding and informed interventions.

Keywords: Exhumation, forensic investigation, homicide, Pakistan, demographic trends, causes of death

INTRODUCTION

Exhumation, the process of retrieving a body from its burial site, plays a pivotal role in forensic science, especially in the context of judicial inquiries into unresolved or contested deaths. In Pakistan, this process is not only a scientific and legal procedure but also a topic of significant cultural and religious sensitivity.[1] The decision to exhume a body often involves complex considerations, balancing the need for justice with respect for the deceased and their families.

The relevance of exhumations in Pakistan is underscored by their potential to clarify the circumstances of death, particularly in cases where foul play is suspected or when the initial autopsy reports are inconclusive.[2] Exhumations may also be necessary when new evidence surfaces or when technological advances allow for more sophisticated post-mortem analyses that were not previously possible. In regions like Faisalabad, the prevalence of exhumation has been documented, indicating a significant demand for these procedures in the face of legal and medical uncertainties.[3]

The legal framework governing exhumations in Pakistan is defined by the Criminal Procedures Code (CrPC), which mandates judicial oversight and strict procedural adherence to ensure that the exhumations are conducted lawfully and ethically. This is essential not only for the integrity of the legal process but also for maintaining public confidence in the justice system.[1] The procedural aspects involve the identification of the grave, the careful disinterment of the body, and subsequent forensic examinations which may include toxicology, histopathology, and other forms of analysis depending on the condition of the remains and the nature of the case.[1-6]

Environmental factors play a crucial role in the outcomes of exhumation. The rate of decomposition is influenced by local climatic conditions, the depth at which the body was buried, and the materials used in the burial process. In the warm climate of many parts of Pakistan, rapid decomposition can obscure forensic evidence, complicating the task of determining the cause of death or identifying the deceased.[4] This challenge is exacerbated by delays in the legal process, which can hinder the effectiveness of exhumations in providing clear answers to grieving families and the justice system.[5]

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The objectives of this study are threefold: to evaluate the procedural integrity of exhumations carried out under the legal system in Pakistan, to analyze the forensic outcomes of these exhumations in terms of establishing causes of death or confirming identities, and to assess the impact of environmental and procedural variables on these outcomes. By addressing these aspects, the study aims to contribute to a better understanding of the effectiveness of exhumations as a tool for justice in Pakistan, particularly in cases of homicide or suspicious deaths where the initial investigations have left substantial doubt about the circumstances surrounding the death.[7]

The exhumation of bodies in Pakistan is a critical yet sensitive endeavor that intersects with legal, medical, and ethical dimensions. This study seeks to dissect these intersections to illuminate the efficacy and implications of exhumations within the Pakistani forensic context. By doing so, it hopes to provide insights that could inform improvements in procedural practices and enhance the overall trust in the mechanisms of forensic justice.

METHODS

Study Design: This research employs a retrospective cohort study design to investigate the frequency of positive exhumation cases within a specified population.

Study Location and Duration: The study was conducted at the department of Forensic Medicine and Toxicology, Gambat Medical College, PSAQJSJIMS GAMBAT AND PUMHS, Nawabshah from January 2023 to July 2023. Exhumations were performed by team in Gambat Medical College, Khairpur.

Sampling Technique: A convenience sampling technique was utilized, wherein cases of exhumation conducted by the team of Gambat Medical College, Khairpur during the specified timeframe were included in the study.

Sample Size Calculations: The sample size was determined using the World Health Organization (WHO) sample size calculator. Based on a frequency of positive exhumation cases at 42.85%[5], a margin of error (d) of 5%, and a confidence level (CI) of 95%, the calculated sample size was n=377.

Data Collection Tools: Data were collected using structured data collection forms designed specifically for this study. These forms included variables related to the characteristics of the exhumed cases, autopsy findings, and any other relevant information.

Data Collection Process: During the specified study period, the team of Gambat Medical College,Khairpur, meticulously documented each exhumation case. Data collection involved a

comprehensive examination of the exhumed bodies, including autopsy procedures, and recording any pertinent findings related to the cause and manner of death.

Ethical Consideration: The study adhered to ethical guidelines outlined by the Institutional Review Board (IRB) of Gambat Medical College,Khairpur . Informed consent was obtained from relevant authorities for the exhumation procedures, and confidentiality of all collected data was strictly maintained throughout the study. Additionally, the study respected the dignity of the deceased individuals and their families, ensuring that all procedures were conducted with utmost sensitivity and respect for cultural norms.

RESULTS

The study involves individuals with a mean age of 39.36±13.89 years, primarily comprising males (72.1%). Regarding residential status, 68.4% are from urban areas, while 31.6% reside in rural regions. The suspected cases for exhumation are categorized as homicide (69.2%), suicide (19.1%), and cases involving DNA analysis (11.7%) as shown in TABLE 1.

Table 1: Demographic data of exhumed bodies

Variable	Mean±SD, Freq (%)	95% C.I.
Age in years	39.36±13.89	37.95 ---- 40.77
Gender		
Male	272 (72.1%)	
Rural	105 (27.9%)	
Residential Status		
Urban	258 (68.4%)	
Rural	119 (31.6%)	
Suspected Cases for exhumation		
Homicide	261 (69.2%)	
Suicide	72 (19.1%)	
DNA Analysis	44 (11.7%)	

In the 18–30 age group, there are 104 individuals, with 74.3% being male and 74.3% female. For the 51–60 age group, 70.3% are male, and 29.7% are female. Finally, in the 60–70 age group, 44.4% are male, and 55.6% are female as documented in TABLE 2.

Table 2: Age and Gender Distribution in Exhumation Cases

Age	Male	Female
18 – 30 Years	104 (74.3%)	104 (74.3%)
31 – 40 Years	48 (76.2%)	15 (23.8%)
41 – 50 Years	63 (75.9%)	20 (24.1%)
51 – 60 Years	45 (70.3%)	19 (29.7%)
60 – 70 Years	12 (44.4%)	15 (55.6%)

The table presents the condition of individuals based on gender. In the identifiable condition category, 72.1% are male, and 27.9% are female. For semi-putrefaction, 70.9% are male, and 29.1% are female.

Table 3: Condition of the Dead body in Exhumation Cases

Condition	Male	Female
Identifiable	124 (72.1%)	48 (27.9%)
Semi Putrefaction	73 (70.9%)	30 (29.1%)
Completely Putrefaction	29 (85.3%)	5 (14.7%)
Skeletonized	26 (76.5%)	8 (23.5%)
Bones Decomposed	20 (58.8%)	14 (41.2%)

The data presents the breakdown of males and females concerning the duration since burial: 2-6 weeks (62.5% males, 37.5% females), 7-12 weeks (83.7% males, 16.3% females), 13-24 weeks (69.4% males, 30.6% females), 25-48 weeks (71.2% males, 28.8% females), and 49-60 weeks (74.5% males, 25.5% females) as shown in TABLE 4.

Table 4: Time since Burial in Exhumation Cases

Time since Burial	Male	Female
2 – 6 weeks	25 (62.5%)	15 (37.5%)
7 – 12 weeks	41 (83.7%)	8 (16.3%)
13 – 24 weeks	25 (69.4%)	11 (30.6%)
25 – 48 weeks	146 (71.2%)	59 (28.8%)
49 – 60 weeks	35 (74.5%)	12 (25.5%)

Firearm injury accounts for 22.0%, poisoning for 5.6%, blunt injury for 16.7%, drowning for 11.1%, and cases labeled as undetermined constitute 44.6%. The positive success rate of exhumation was 58.4% while exhumation was negative in 41.6% bodies (TABLE 5).

Table 5: Causes of death on Exhumation

Cause	Frequency	Percentage
Fire Arm injury	83	22.0%
Poisoning	21	5.6%
Blunt injury	63	16.7%
Drowning	42	11.1%
Undetermined	168	44.6%

DISCUSSION

Exhumation, the process of digging up and examining a deceased person's body, is a complex and sensitive procedure. It involves various reasons such as homicide, suicide, and DNA analysis.[8,9] The study examined individuals with a mean age of 39.36±13.89 years, primarily males (72.1%) from urban areas (68.4%). Reasons for exhumation included homicide (69.2%), suicide (19.1%), and DNA analysis (11.7%). Demographic trends varied across age groups, with males dominating younger cohorts and females being more prevalent in older age groups. The condition of individuals and duration since burial differed by gender, with males more commonly found in identifiable conditions and shorter durations since burial. Causes of death encompassed firearm injuries (22.0%), poisoning (5.6%), blunt injuries (16.7%), drowning (11.1%), and undetermined cases (44.6%). Overall, the success rate of exhumation was 58.4%, with negative outcomes in 41.6% of cases.

While the study focused on exhumations in Pakistan, it is important to consider findings from other related research. Exhumation outcomes have been studied in various countries around the world [10-13], and the findings provide valuable insights into the process and its outcomes. Research from countries such as the United States, the United Kingdom, Saudia Arabia and Spain has shown that exhumation outcomes can vary widely depending on factors such as the condition of the body, the expertise of the forensic team, and the specific aims of the exhumation.

For example, a study in the United States found that exhumation outcomes were most successful when the process was carried out by experienced forensic anthropologists and pathologists. [14] Similarly, research in the United Kingdom revealed that exhumations for the purpose of DNA analysis resulted in high success rates when conducted using advanced forensic techniques [15-17] In Spain, exhumations related to historical and political contexts have provided important insights into the identification of individuals and the preservation of evidence for

use in legal proceedings. [18] By drawing on findings from these and other countries, we can gain a more comprehensive understanding of exhumation outcomes and their potential implications for forensic investigations in Pakistan.

The findings regarding the causes of death in the current study present a diverse range of factors, including firearm injuries, poisoning, blunt injuries, and drowning. This distribution contrasts with previous studies conducted in Shaheed Benazirabad, where the primary reason for death after exhumation was the use of sharp instruments in the majority of homicide cases. [19] The disparity in findings could stem from several factors. Firstly, regional differences in societal norms, cultural practices, and access to weapons may influence the methods used in homicides. For instance, areas with higher rates of firearm ownership may see a greater proportion of deaths resulting from gunshot wounds, while regions with limited access to firearms may witness more deaths from sharp instrument use. In this study by Kumar et al[19], exhumations were likely initiated due to family members' suspicions of homicide, especially when initial physical examinations failed to determine the cause of death. Additionally, suspicions may have been fueled by concerns related to property distribution within families. However, it's important to note that these conclusions are drawn from the current study alone, and broader national studies may provide additional context and insights.

Additionally, variations in forensic practices and investigative techniques between studies can impact the identification and documentation of causes of death. Different methodologies or levels of forensic expertise may lead to differences in the categorization and attribution of specific causes of death. Moreover, demographic characteristics of the study populations, such as age, gender, and socio-economic status, can also influence the prevalence of certain methods of homicide. For instance, younger populations may be more involved in violent confrontations resulting in blunt injuries or firearm-related incidents, while poisoning may be more prevalent among specific demographic groups due to access to toxic substances or motives related to poison.

CONCLUSION

In conclusion, this study sheds light on the outcomes of exhumation procedures in Pakistan, revealing demographic patterns, causes of death, and success rates. The findings underscore the importance of culturally sensitive forensic practices and highlight regional variations in homicide methods. Further research incorporating broader contexts is essential for a comprehensive understanding and informed interventions. By addressing these factors, forensic investigations can be refined, contributing to improved justice and violence prevention measures in Pakistan and beyond.

REFERENCES

1. Javed MW, Karem N. Exhumation and its Procedural Aspects in Pakistan. Journal of Law & Social Studies (JLSS).;3(1):19-27.
2. Hussain T, Bhatti AM, Ahmed QI, Karim A, Abid MM, Abid MH. Fate/Outcome of Exhumation in Pakistan. InInfimed. Forum 2019 Nov 16.
3. Nadeem S, Parveen H, Awan AF. PREVALENCE OF EXHUMATION IN DISTRICT FAISALABAD;: A LOCAL EXPERIENCE. The Professional Medical Journal. 2018 Aug 4;25(08):1277-82.
4. Parveen A, Rajper S, Kumar P, Memon HA, Memon AU, Aslam N. Exhumation-A key to supporting homicide victims' justice: Situation in Hyderabad District of Pakistan. A cross-sectional study. Annals of the Romanian Society for Cell Biology. 2021 Dec 30;25(7):1882-6.
5. Humayun M, Khichi ZH, Chand H, Khan O. Exhumation—A Key To Provide Justice To Victims Of Homicide: Situation In Larkana And Sukkur Divisions. Journal of Ayub Medical College Abbottabad. 2010 Mar 1;22(1):168-70.
6. Saleem MW, Singh D, Fauzia T, Rashid A, Hashmat S, Alam SA. Analysis of exhumations carried out in three divisions of Sindh. Pakistan Journal of Medical & Health Sciences. 2023 Dec 20;17(06):445-.
7. Awan E, Afzal H, Yousfani GM, Imran S, Memon A, Pehlwani HA. Retrospective analysis of 258 consecutive forensic exhumations with emphasis on causative agents/cause of death. JMMC. 2022;13(1):9-12.
8. Gitanjali D. Descriptive study of exhumations--a four-year study in a medical college in north Tamilnadu--India. Journal of Evolution of Medical and Dental Sciences. 2018 Jun 4;7(23):2757-61. DOI 10.14260/jemds/2018/623. https://www.jemds.com/data_pdf/gitanjali-june-4-.pdf
9. Akhiwu WO, Nwafor CC. Exhumations: rarely done procedure but useful in many circumstances—a review of 47 cases in Nigeria. Egyptian Journal of Forensic Sciences. 2019 Dec;9:1-9. DOI 10.1186/s41935-019-0175-x. https://ejfs.springeropen.com/articles/10.1186/s41935-019-0175-x
10. Mouhammed AD. Whether dead men really do tell stories-a study on tales from the graves. ARCHIVOS DE MEDICINA. 2017;3(2):7. https://toxicology.imedpub.com/whether-dead-men-really-do-tell-stories-a-study-on-tales-from-the-graves.php?aid=20749
11. Cai J, Dawson L, Javan GT, Özsoy S, Quaak FC, Ralebitso-Senior TK. From Experimental Work to Real Crime Scenes and the Courts. InForensic Ecogenomics 2018 Jan 1 (pp. 177-209). Academic Press. DOI https://doi.org/10.1016/b978-0-12-809360-3.00008-4
12. Zaki MK, Sobh ZK. Knowledge, attitude, and practice of forensic practitioners during COVID-19 pandemic in Arab countries. Legal Medicine. 2021 Sep 1;52:101903. DOI 10.1016/j.legalmed.2021.101903. https://pubmed.ncbi.nlm.nih.gov/33990044
13. Finney R, Shulman L, Kheirbek R. Embalming, Viewing and the Social Construction of the Corpse: Time for Another Look. Innovation in Aging. 2021;5(Suppl 1):771. DOI 10.1093/geroni/igab046.2853. https://www.ncbi.nlm.nih.gov/pmc/articles/8681364
14. Pittner S, Bugelli V, Benbow ME, Ehrenfellner B, Zissler A, Campobasso CP, Oostra RJ, Aalders MC, Zehner R, Lutz L, Monticelli FC. The applicability of forensic time since death estimation methods for buried bodies in advanced decomposition stages. PLoS One. 2020 Dec 9;15(12):e0243395. DOI 10.1371/journal.pone.0243395. https://doi.org/10.1371/journal.pone.0243395
15. Mansegosa DA, Giannotti PS, Marchiori JI, Jofré FN, Aballay FH, Aisa CF. The story of a homicide: The location, exhumation, and multidisciplinary analysis of a clandestine burial. Forensic Science International: Reports. 2021 Jul 1;3:100165. DOI 10.1016/j.fsir.2020.100165. https://www.sciencedirect.com/science/article/pii/S2665910720301158
16. de Boer HH, Obertová Z, Cunha E, Adalian P, Baccino E, Fracasso T, Kranioti E, Lefévre P, Lynnerup N, Petaros A, Ross A. Strengthening the role of forensic anthropology in personal identification: position statement by the Board of the Forensic Anthropology Society of Europe (FASE). Forensic Science International. 2020 Oct 1;315:110456. https://www.sciencedirect.com/science/article/pii/S0379073820303182
17. Etxeberria F, González-Ruibal A, Herrasti L, Márquez-Grant N, Muñoz-Encinar L, Ramos J. Twenty years of forensic archaeology and anthropology of the Spanish Civil War (1936–1939) and Francoist Regime. Forensic Science International: Synergy. 2021;3. DOI 10.1016/j.fsisyn.2021.100159. https://pubmed.ncbi.nlm.nih.gov/34471866
18. Márquez-Grant N, Díaz MÁ, González RM. The use of archaeology in the criminal and medico-legal context in Spain. Forensic archaeology: A global perspective. 2015 Mar 11:173-82. DOI https://doi.org/10.1002/9781118745977.ch21
19. KUMAR P, AWAN EA, SAMAD A. Positive versus Negative Exhumation Post-Mortem: An Ethical Concern of a Burial Body.

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