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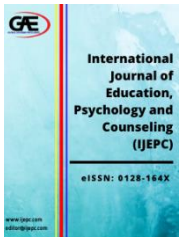


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# THE FUTURE SOLDIERS: ETHICAL AND STRATEGIC CHALLENGES IN DNA PROFILING FOR MILITARY RECRUITMENT

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**Abstract:**

This study explores the intersection of DNA profiling and military recruitment, focusing on the ethical, strategic, and operational implications of using genetic information to optimize soldier selection. The study aims to investigate the potential benefits of integrating DNA profiling into military recruitment and examine the ethical challenges, specifically regarding privacy, discrimination, and consent. A qualitative, phenomenological approach was employed, involving informal interviews with three military experts: Maj Gen Dato Hj Ya'cob bin Hj Samiran, Brig Gen Zainudin bin Bahari, and FAdm Dr. Tay Yap Leong. The valid responses were analysed using NVivo 12 Plus Through thematic analysis of interview data, the study outlines potential benefits such as personalized training, disease resistance identification, and budget optimization, while addressing ethical concerns like genetic discrimination and privacy violations. The research reveals that while DNA profiling offers strategic advantages, unresolved ethical and legal issues could hinder its implementation. The study is limited by its reliance on informal interviews and the absence of empirical validation through DNA profiling trials. Future studies should explore the practicality and broader societal implications of these technologies.

**Keywords:**

DNA Profiling, Ethics, Military, Privacy, Strategy, Knowledge

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## Introduction

Military operations are now entering an era where advanced technologies and information systems have the potential to reshape traditional paradigms. DNA profiling is one such area where genetic information could be leveraged to enhance military recruitment, particularly in identifying candidates with advantageous physical, cognitive, and psychological traits. In Islamic tradition, knowledge is viewed as both a gift and a responsibility that guides ethical behaviour. The Prophet Muhammad (PBUH) emphasized the importance of seeking knowledge throughout one's life, a principle that extends to governance, decision-making, and ethical considerations. As an advanced form of knowledge, DNA profiling must be approached with caution to avoid misuse. The ethical implications of utilizing such powerful technologies, particularly concerning privacy, genetic discrimination, and consent, cannot be overstated (Smith & Johnson, 2020).

The concept of knowledge as power is a central tenet in both Islamic philosophy and modern military strategy. In Islam, the ethical responsibility to use knowledge for the greater good is paramount, as underscored in the Quran: *"He (Allah) taught man that which he knew not"* (Quran 96:5). This verse highlights the moral obligation to utilize knowledge wisely and ethically. The rapid advancements in DNA profiling technologies present significant ethical challenges, particularly in military recruitment, where the line between strategic advantage and ethical misconduct may blur. DNA profiling, which has already transformed fields such as forensic science and medicine, holds the potential to revolutionize military operations. However, concerns regarding privacy, genetic discrimination, and informed consent raise critical questions about how genetic information should be used in human resource decision-making (Smith & Johnson, 2020). As military organizations increasingly depend on data-driven approaches for recruitment and training, it becomes essential to critically evaluate the ethical frameworks that guide the use of DNA profiling.

Recent developments in artificial intelligence (AI), augmented reality (AR), and DNA profiling have already begun to transform military strategies (Smith & Johnson, 2020). Initially employed in forensic science and medical diagnostics, DNA profiling is now being considered as a tool to optimize military recruitment by identifying candidates with desirable traits. However, this integration of technology also raises significant ethical concerns, particularly in areas such as privacy, informed consent, and potential genetic discrimination (Williams & Clarke, 2019). The integration of advanced technologies, such as AI, AR, and DNA profiling, signals a paradigm shift in military operations. These innovations offer unprecedented potential to optimize recruitment and training processes. However, with this increased power comes heightened responsibility—particularly in managing genetic information in an ethically sound manner. Proper consideration must be given to ensure that these technologies are employed in ways that respect individual rights and societal values

This study aims to explore how DNA profiling could shape the future of military recruitment by increasing efficiency while simultaneously presenting ethical and practical dilemmas.. This paper explores the feasibility and implications of incorporating DNA profiling into military recruitment, addressing the ethical, legal, and practical challenges. Discussions with Maj Gen Dato Hj Ya'cob bin Hj Samiran, Brig Gen Zainudin bin Bahari, and FAdm Dr. Tay Yap Leong highlighted strategies to mitigate ethical issues while recognizing potential benefits for future recruitment and career development.

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## Literature Review

### *The Power of Knowledge Theory*

The concept that knowledge equates to power dates back to the works of *Francis Bacon* and is also rooted in Islamic philosophy, as seen in the teachings of *Al-Ghazali*. In modern contexts, this theory is highly applicable to military strategies that emphasize the use of data and information to enhance decision-making and efficiency. Bacon's statement, "*Knowledge is power*," reflects the military's potential to leverage DNA profiling in recruitment to create optimized, resilient forces (Davis & Thompson, 2020). The collection of genetic data provides actionable insights that can be strategically deployed to improve soldiers' performance and the effectiveness of military operations.

The theory of *knowledge as power*, first popularized by Francis Bacon, suggests that information gives individuals and organizations the ability to shape their futures. In military contexts, DNA profiling offers a powerful means of improving recruitment by providing precise insights into physical and cognitive abilities (Davis & Thompson, 2020). However, Islamic thought also emphasizes the responsibility that comes with knowledge, as expressed by scholars like *Al-Ghazali*, who argued that knowledge should be used to promote justice and the well-being of society.

### *Ethical Framework in DNA Profiling*

The ethical framework governing the use of DNA in human contexts, particularly in Islamic and secular ethical thought, prioritizes *justice*, *privacy*, and *non-discrimination*. DNA profiling in military recruitment raises questions of genetic determinism, a form of reductionism that discounts the complex interplay of nature and nurture. Islamic ethics stress the importance of respecting human dignity and privacy, aligning with secular perspectives such as *Kant's moral philosophy*, which advocates for the inherent worth of individuals and the ethical limits of using genetic information to make human resource decisions (Williams & Clarke, 2019).

## Methodology

This study employs a qualitative, phenomenological approach to explore the ethical implications and potential benefits of DNA profiling in military recruitment. The research methodology consists of two key elements:

### *Data Collection*

Informal interviews were conducted with three key military figures—Maj Gen Dato Hj Ya'cob bin Hj Samiran, Brig Gen Zainudin bin Bahari, and FAdm Dr. Tay Yap Leong. These discussions focused on their views regarding the practical and ethical considerations of integrating DNA profiling into recruitment processes. Informal interviews were conducted with Maj Gen Dato Hj Ya'cob bin Hj Samiran, Brig Gen Zainudin bin Bahari, and FAdm Dr. Tay Yap Leong. These military experts were asked to provide insights on the strategic and ethical aspects of using genetic data for recruitment. The interviews focused on their personal experiences and perceptions of the use of advanced technology in the military.

### *Data Analysis*

Following the interviews, data collected were completely transcribed; the recorded interviews were played several times; and the organized materials were read line-by-line several times. In order to obtain a deeper descriptive structure of the responses, the content of each interview is

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further analysed based on the thematic deductive analysis (Braun and Clarke, 2006). Using this technique, the patterns of the interview data were analysed to extract the themes and subthemes hidden among the responses. The data were themed and analysed using NVivo software. NVivo is a qualitative software, which has been used extensively in qualitative research, as a means to facilitate in the categorization process (Welsh, 2002).

This method allowed for an in-depth understanding of the experts' perspectives on both the advantages and the challenges associated with DNA profiling. The data analysis allowed the thematic analysis in identifying recurring themes, such as privacy concerns, genetic discrimination, and the potential strategic advantages of DNA profiling.

The methodology also provides a comprehensive understanding of expert perspectives but is limited by the subjective nature of informal interviews. No empirical data was collected to support or challenge the claims made during the interviews.

In conclusion, the methodology is exploratory, aiming to provide an initial understanding of the phenomenon rather than empirical validation. The informal nature of the interviews adds a dimension of candidness but also presents a limitation in the generalizability of findings. The valid responses were analysed using NVivo 12 Plus

## Analysis and Findings

### *Potential Benefits of DNA Profiling in Military Recruitment*

From the analysis, it was found that there are potential benefits of DNA profiling in military recruitment of which are stipulated below such as the identification of physical traits and genetic aptitude matching; identification of cognitive traits and cognitive enhancement; personalized training and development; promoting optimisation of nation's defence budget; and understanding of sport and post service career talent.

Using informal interview, this study presents five dimensions of critical success factors generated from the analysis of the content of the qualitative data. The dimensions highlighted are as follows: physical aptitude; cognitive and psychological aspects; ethical concerns; legal challenges; personalized training; strategic benefits and budget. The descriptions on the key findings are as follows .

### *Identification of Physical Traits and Genetic Aptitude Matching*

One potential benefit of integrating DNA profiling in military recruitment is the identification of physical traits that could enhance soldiers' physical and mental capabilities. Genetic markers associated with muscle strength, endurance, and overall physical fitness could be identified, allowing the military to select candidates with optimal physical traits for specific roles. This precision in recruitment could lead to a more physically capable and resilient force, capable of meeting the rigorous demands of military operations (Kim & Kim, 2018). According to Williams and Clarke (2019), the use of genetic information can significantly contribute to identifying individuals who possess the physical traits necessary for high-performance military tasks.

For instance, specific genetic markers linked to high oxygen utilization and muscle fibre composition could be advantageous in selecting elite infantry units. DNA profiles could be

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analysed to identify individuals with genetic markers associated with physical fitness, endurance, or resistance to specific environmental factors. It also could be used as guide in enhancing physical abilities by genetic modifications, or might be explored to enhance physical abilities, such as strength or speed, beyond natural human limits. This could help in selecting candidates for roles that require these attributes.

Another benefit is the disease resistance in evaluating individuals with genetic resistance to certain diseases could be valuable for maintaining a healthy and operational force in challenging environments.

***Identification of Cognitive Traits and Cognitive Enhancement***

In addition to physical traits, DNA profiling can also identify cognitive traits that enhance strategic and decision-making skills. Genetic information might be used to identify individuals with cognitive traits such as higher intelligence, memory, or decision-making abilities, making them suitable for roles in strategy, intelligence, or leadership positions.

Cognitive abilities such as memory, attention, and problem-solving are critical in military settings where quick thinking and strategic planning are essential. By identifying genetic markers linked to these cognitive traits, the military could potentially recruit individuals predisposed to excel in high-stress and complex environments (Jackson, 2016). For example, genetic variants associated with enhanced cognitive resilience under stress could be valuable in selecting personnel for high-stakes roles such as special operations force. Williams and Clarke (2019) suggest that understanding genetic influences on cognitive functions can aid in selecting personnel who are better suited for roles requiring advanced strategic and cognitive capabilities.

DNA profiling could also be used to assess psychological traits like resilience, stress management, and adaptability, which are crucial for soldiers in high-stress combat situations.

***Personalized Training and Development***

Another significant advantage of DNA profiling in military recruitment is the potential for personalized training and development. By understanding an individual's genetic profile, training programs can be tailored to maximize their strengths and address any weaknesses. Personalized training can lead to more effective and efficient development of military personnel, enhancing overall performance and readiness (Peterson, 2017).

Kim and Kim (2018) highlight that customized training based on genetic profiles can optimize learning outcomes and improve the efficacy of training programs, ultimately leading to a more capable and adaptable military force. Customized training regimens based on genetic predispositions could optimize physical conditioning, mental resilience, and even recovery times from injuries. Tailoring training programs based on an individual's genetic profile could help maximize their potential in specific roles.

***Promoting Optimisation of Nation's Defence Budget***

By managing a methodological genomic approach in military population studies, DNA profiling could help in optimizing the Nation's Defence Budget. Genetic profiling can aid in reallocating resources to meet the physical, physiological, and psychological needs of military personnel. This approach allows the government to better understand and optimize food

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rations, nutritional needs, and the requirements for retraining and personnel mobility's (Davis & Thompson, 2020).

For example, genetic data could inform tailored nutrition plans that enhance performance and health, reducing overall healthcare costs and improving operational efficiency.

***Understanding of Sport and Post Service Career Talent***

Military personnel are not merely combatants but individuals with multifaceted talents and potentials. Understanding their genetic predispositions can uncover hidden talents in sports and other career fields. In peaceful times, these uncovered talents can significantly contribute to national sports and other areas.

Moreover, recognizing and nurturing these talents can provide military personnel with valuable career opportunities post-service, facilitating their transition to civilian life and ensuring their long-term well-being and productivity (Brown & Green, 2021).

***Ethical Concerns in DNA Profiling for Military Recruitment***

From other pertinent aspects, it was also found that there are ethical concerns in DNA profiling for military recruitment as stipulated below such as the privacy issues; genetic discrimination; consent and autonomy; and other related issues in respect to ethical concerns.

***Privacy Issues***

One of the foremost ethical concerns in utilizing DNA profiling for military recruitment is the risk of genetic data breaches. The sensitive nature of genetic information necessitates stringent measures to ensure its protection and confidentiality. Unauthorized access or misuse of genetic data could lead to significant privacy violations and personal harm (Smith & Johnson, 2020). Robust security protocols and policies must be implemented to safeguard genetic information, ensuring that only authorized personnel can access and use the data for its intended purpose.

Jackson (2016) emphasizes the importance of implementing robust security protocols and policies to safeguard genetic information, ensuring that only authorized personnel can access and use the data for its intended purpose. Maintaining confidentiality is paramount to protecting individuals' privacy rights and preventing potential misuse.

***Genetic Discrimination***

The potential for genetic discrimination poses another significant ethical challenge in the context of military recruitment. There is a risk that individuals may be unfairly judged or excluded based on their genetic traits, leading to discrimination in recruitment, promotion, and other aspects of military life (Williams & Clarke, 2019). Jackson (2016) discusses the dangers of genetic discrimination and underscores the need for policies and practices that mitigate biases. Ensuring a fair and equitable recruitment process requires careful consideration of how genetic information is used and establishing safeguards to prevent discriminatory practices based on genetic data.

***Consent and Autonomy***

Ensuring informed consent and respecting individual autonomy are critical ethical considerations when implementing DNA profiling in military recruitment. It is essential that individuals fully understand the implications of genetic testing and voluntarily agree to

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participate without coercion. Jackson (2016) highlights the importance of transparency and education in the consent process, ensuring that individuals are aware of their rights and the potential uses of their genetic information.
Respecting autonomy means that individuals should have the right to decide whether or not to undergo genetic testing and how their genetic data will be used, reinforcing the principles of personal freedom and informed decision-making (Jackson, 2016).

***Other Issues***
In the context of using DNA profiling for recruitment, concerns about eugenics and genetic determinism arise when genetic information is used to select or prioritize individuals for specific roles based solely on their genetic traits. This approach simplifies the complex nature of human attributes, fails to account for environmental factors, and can lead to discrimination and ethical dilemmas similar to those associated with historical eugenics movements.

Modern science recognizes the importance of both genetic and environmental factors in shaping human traits and acknowledges the ethical imperative to respect individual autonomy, rights, and dignity. Therefore, genetic determinism and eugenic practices are viewed with scepticism in contemporary ethical and scientific discussions.

Stochastic factors, in the context of genetics and biology, refer to random or unpredictable events and processes that can influence the development, traits, and outcomes of living organisms. These factors introduce an element of chance and variability into biological systems.

In summary, stochastic factors introduce an element of chance and unpredictability in genetics, biology, and development. They emphasize that while genetic and environmental factors play critical roles in shaping living organisms, there is always some degree of inherent randomness in biological processes. This recognition of stochastic factors is important in understanding the complexity and diversity of life.

***Legal and Practical Challenges in DNA Profiling for Military Recruitment***
From the analysis and findings, there are issues in relation to legal and practical challenges in DNA profiling for military recruitments such as about the legal framework and regulations; and practical considerations in implementation.

***Legal Frameworks and Regulations***
The implementation of DNA profiling in military recruitment necessitates a thorough understanding of the existing legal frameworks and regulations. While there are legal protections in place to safeguard genetic information, significant gaps remain that could pose challenges. Smith and Johnson (2020) highlight the inadequacies in current legal structures, particularly in addressing the nuances of genetic data usage in military contexts. Furthermore, international perspectives vary widely, with some countries having stringent regulations while others lack comprehensive legal protections.

Furthermore, international perspectives vary widely, with some countries having stringent regulations while others lack comprehensive legal protections (Smith & Johnson, 2020). This disparity complicates the establishment of a standardized approach to DNA profiling in

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military recruitment, necessitating a careful analysis of global legal standards and the development of robust, cohesive policies to protect individuals' genetic data.

***Practical Considerations in Implementation***

Beyond legal challenges, the practicalities of implementing DNA profiling in military recruitment present substantial hurdles. The logistics of DNA collection and analysis are complex and resource-intensive. Peterson (2017) discusses the practical issues related to the infrastructure and technology needed for DNA analysis, including the challenges of integrating genetic data into existing military systems. Efficiently and securely collecting genetic samples from a large pool of candidates requires meticulous planning and execution.

In ensuring the seamless and secure incorporation of genetic information into recruitment processes involves addressing technological, operational, and administrative aspects, all of which are critical to the successful implementation of DNA profiling in military settings (Peterson, 2017).

***Addressing Ethical, Legal, and Privacy Concerns in DNA Profiling: Strategies and Recommendations***

The rapid advancement in DNA profiling technology necessitates a rigorous approach to ethical, legal, and privacy concerns. This article outlines critical strategies to address these concerns, emphasizing the importance of developing comprehensive ethical guidelines, enhancing legal protections, ensuring privacy and data security, promoting transparency and accountability, and ensuring informed consent.

***Developing Ethical Guidelines***

Establishing clear ethical standards is paramount to the responsible use of DNA profiling. Collaboration with bioethicists and legal experts is essential in crafting these guidelines, ensuring they are robust and comprehensive (Williams & Clarke, 2019). Ethical guidelines should address issues such as informed consent, data privacy, and non-discrimination, providing a framework for the ethical use of genetic information in military recruitment.

***Enhancing Legal Protections***

Robust legal frameworks are necessary to protect individuals' genetic information. Advocating for and ensuring compliance with international laws is a crucial strategy. Continuous updates to legal protections are needed to keep pace with technological advancements, ensuring that they provide effective safeguards against misuse (Smith & Johnson, 2020).

***Ensuring Privacy and Data Security***

Protecting the privacy and security of genetic data is of utmost importance. Implementing advanced data encryption methods is a key strategy in safeguarding this sensitive information. Regular audits and monitoring of data usage further ensure that data security protocols are adhered to, minimizing risks of data breaches (Peterson, 2017).

***Promoting Transparency and Accountability***

Transparent policies on the use of genetic data and accountability mechanisms for misuse are essential to foster trust in DNA profiling technologies. Clear, accessible policies help individuals understand how their data will be used, while accountability mechanisms ensure that any misuse of information is promptly addressed (Jackson, 2016).

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***Ensuring Informed Consent***

Informed consent is a cornerstone of ethical DNA profiling. Comprehensive consent processes ensure that individuals are fully aware of how their genetic information will be used. Continuous education and awareness programs are also critical, as they keep the public informed about their rights and the implications of DNA profiling (Williams & Clarke, 2019).

***Psychometrics and DNA profiling***

Selection based on psychometrics and DNA profiling are two distinct approaches for assessing and identifying individuals for various purposes, including recruitment. Here are how they differ.

***Basis of Assessment***

With regard to basic assessment, there are difference between psychometric and DNA profiling such as psychometrics involves the measurement of psychological traits, abilities, and characteristics through standardized tests and assessments. These can include cognitive assessments, personality tests, and situational judgment tests. Psychometrics focuses on evaluating an individual's mental and emotional attributes.

On the other hand, DNA profiling, involves with the analysis of an individual's genetic material to identify specific genetic markers or traits. It is rooted in the analysis of an individual's biological and genetic makeup.

***Nature of Traits Assessed***

There are also difference with respect to nature of traits assessed such as psychometric assessments typically measure psychological and cognitive traits such as intelligence, personality, emotional stability, problem-solving abilities, and interpersonal skills. These traits are considered malleable and influenced by a combination of genetic, environmental, and developmental factors.

Meanwhile, DNA profiling focuses on genetic traits, which are typically considered less malleable. These traits can include genetic predispositions to certain diseases, physical attributes, and, theoretically, some behavioural traits based on current genetic knowledge.

***Ethical and Legal Considerations***

There are also differences in ethical and legal considerations such as psychometrics: While ethical considerations are still crucial in the use of psychometric assessments, there are established guidelines and ethical standards in the field of psychology to protect individual rights, informed consent, and fair use of assessments whereas, the use of DNA profiling for selection raises more complex and contentious ethical and legal issues, as discussed earlier.

Genetic information is often considered more sensitive, and there are fewer established guidelines for its use in contexts like recruitment.

***Complexity of Analysis***

There are also distinct differences due to the complexities of the analysis such as the analysis of psychometric data focuses on interpreting responses to standardized tests and questionnaires, which are typically well-established and validated. The analysis of psychometric data is complex but well-understood within the field of psychology.

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On the other end, genetic analysis is a highly specialized and technically complex field. It involves DNA sequencing and the identification of specific genetic markers. Genetic analysis requires advanced laboratory equipment and expertise, making it more resource intensive.

***Predictive Value***

There are also differences with respect to predictive values of both analyses. Psychometric assessments aim to predict an individual's potential or performance based on their cognitive and psychological traits. While they can offer valuable insights, they are not absolute predictors and may not fully capture an individual's abilities.

As opposed to that, DNA profiling, even if hypothetically used to predict certain traits, still has limitations in predicting complex human attributes or behaviour. Genetic information is only one factor among many that influence an individual's traits and capabilities.

In summary, while both psychometric assessments and DNA profiling are tools for assessing individuals, they differ significantly in terms of the nature of traits assessed, ethical considerations, complexity, and predictive value. Psychometrics focuses on psychological and cognitive traits, while DNA profiling deals with genetic traits, and each approach has its own set of strengths and limitations.

**Guidelines for Ethical DNA Profiling**

Establishing ethical guidelines for DNA profiling is a complex task that requires careful consideration and input from various stakeholders. Here's a general guideline that can serve as a starting point for discussions on ethical, legal, and moral considerations in DNA profiling.

***Informed Consent***

For informed consent, the principle is to obtain clear and informed consent from individuals before collecting and analysing their DNA. In term of implementation, the involved individuals must be provided with detailed information about the purpose, risks, and potential consequences of DNA profiling. They should have the right to refuse participation without any adverse consequences.

***Data Privacy and Security***

With respect to data privacy and security, the principle is to safeguard genetic data to protect individuals' privacy and security. In term of implementation, it is a must to establish stringent security measures to protect genetic information from unauthorized access, breaches, or misuse. Adhere to relevant data protection laws and regulations.

***Non-Discrimination***

The principle of non-discrimination is ensuring that genetic information is not used to discriminate against individuals. In term of implementation, the prohibition of the use of genetic data for discriminatory purposes, including in areas such as employment, insurance, or access to services. Enforce legal protections against genetic discrimination.

***Transparency***

In term of transparency the principle is to maintain transparency in the use of genetic data. While, in term of implementation, the need to clearly communicate the purposes and uses of

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genetic profiling to individuals. Moreover, in term of implementation, it is a pre-requisite to promote transparency in research, testing, and data storage practices.

***Access and Ownership***
With regard to access and ownership, the principle is the need to really clarify the ownership and access rights to genetic data is vital. In term of implementation, the definition of who owns the genetic data need to be established. The established guidelines for how and when individuals can access their own data are also essential. It also need to really specify on how researchers or organizations able to access data for legitimate purposes.

***Limited Scope***
The guideline also need to scrutinize the limited scope of DNA profiling. In principle, the limit of genetic profiling need to be well-defined and with ethically justifiable purposes. Meanwhile, in term of implementation, the definition to specific contexts in which genetic profiling is permitted, such as medical research, diagnosis, and treatment are must observed processes. Moreover, it is also vital to prohibit profiling for arbitrary or frivolous purposes.

***Third-Party Use***
The third party use principle's guideline is the need to regulate the sharing of genetic data with third parties. In respect to implementation, *it r*equires explicit consent for any sharing of genetic data with third parties. In addition to that, it is vital to monitor and control the purposes and recipients of shared data.

***Ethical Review Boards***
In principle, the establishment of an independent ethical review boards to oversee genetic profiling is a must. In order to implement as such, it is vital to create expert committees to assess and approve the ethical and scientific justifiability of genetic profiling projects, especially in research contexts.

***Public Engagement***
The principle of public engagement is to involve with the public and stakeholders in decision-making. However, in term of implementation, the encouragement of public input and engagement in discussions surrounding the ethical use of DNA profiling is a necessity. Moreover, the promotion through dialogue between policymakers, scientists, and the public are also advisable.

***Continuous Evaluation***
In ensuring continuous evaluation, the principle is to regularly review and update ethical guidelines. In term of implementation, it becomes vital to ensure that guidelines are evolving with advances in science, technology, and societal values. Moreover, periodically assess the ethical implications of genetic profiling as well as adaption to new and existing policies are addressed accordingly.

In a nutshell, these guidelines aim to promote responsible and ethical DNA profiling practices that respect individual rights, protect privacy, and ensure that the use of genetic information benefits society without causing harm or discrimination. Stakeholders, including scientists, policymakers, ethicists, and the public, should be actively involved in shaping and upholding these guidelines.

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## Conclusion

This study underscores the transformative potential of DNA profiling in military recruitment, particularly by enhancing the precision of soldier selection and training. Nevertheless, it also uncovers substantial ethical and legal concerns, such as privacy violations, genetic discrimination, and the need for informed consent. These challenges must be carefully addressed before the technology can be ethically integrated into military practices. The primary contribution of this research is its identification of both the strategic advantages and the ethical dilemmas posed by the use of DNA profiling in military contexts.

Addressing the ethical, legal, and privacy concerns surrounding DNA profiling in military recruitment requires a comprehensive and multifaceted approach. Key strategies include developing robust ethical guidelines, enhancing legal protections, securing privacy and data integrity, promoting transparency, and ensuring informed consent. These strategies are essential to ensuring the responsible and ethical use of DNA profiling technologies, protecting individuals' rights, and fostering public trust. Continuous education and collaboration among military, legal, and bioethical stakeholders will be vital in maintaining and refining these standards as the technology evolves.

This study contributes to the broader discourse on the intersection of genetic information and military strategy, providing a nuanced understanding of the ethical complexities involved. Future research must continue to explore these dimensions to ensure that the deployment of DNA profiling in military contexts is both effective and ethically sound. Future studies should aim to conduct pilot programs that test the feasibility and societal impacts of genetic profiling in recruitment, including legal frameworks that could govern its use. Moreover, empirical research that evaluates the actual predictive power of genetic information in determining physical and cognitive traits is needed to substantiate the claims made in this study. A follow up study should be made to evaluate the scientific validity of using genetic information for recruitment, assess the legal frameworks governing genetic data, and propose guidelines for the ethical and responsible use of DNA profiling in military contexts.

## Limitations

The primary limitation of the study is its reliance on informal interviews without empirical testing of DNA profiling's practical applications in recruitment.

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**Appendix:**

A summary of the key findings is presented below:

| Theme | Key Findings |
|---|---|
| **Physical Aptitude** | DNA profiling can identify genetic markers for strength, endurance, and disease resistance. |
| **Cognitive and Psychological** | Genetic information can highlight cognitive traits like memory, intelligence, and decision-making. DNA markers can potentially reveal intelligence, memory, stress resilience, and leadership potential. |
| **Ethical Concerns** | Privacy violations, potential for genetic discrimination, and lack of informed consent are major concerns. |
| **Legal Challenges** | Current legal frameworks are insufficient to handle the complexity of genetic data in military recruitment. |
| **Personalized Training** | Tailored training based on genetic profiles can improve soldier performance and resource allocation. |
| **Strategic Benefits** | Personalized training based on genetic predispositions could optimize soldier performance. |
| **Budget Optimization** | DNA profiling could optimize the defence budget by better aligning resources with soldier needs. Genomic data could allow for more efficient resource allocation, reducing training and healthcare costs. |

Source: (Tengku Ahmad Ridhaudin & Abdul Rahim Abdul Rahman, 2024)