https://research.adra.ac.id/index.php/islamicstudies
P - ISSN: 3048-3980
E - ISSN: 3048-4146

Transhumanism and the Islamic Ontological Paradigm: Evaluating the Bioethical Implications of Technological Enhancements on Human Fitrah

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ABSTRACT

Background. Rapid developments in genetic engineering, neurotechnology, artificial intelligence, prosthetics, and life-extension technologies have intensified ethical debates regarding whether technological enhancement may transform the meaning of human nature. Therefore, a comprehensive ethical framework is needed to evaluate human enhancement beyond technological capability alone.

Purpose. This study aimed to examine the bioethical implications of transhumanist enhancement through the Islamic ontological concept of *fitrah*. Specifically, it explored how different forms of technological modification relate to human dignity, moral agency, identity, and the integrity of human existence within an Islamic ethical perspective.

Method. This qualitative philosophical-normative study employed conceptual analysis, comparative argument evaluation, case-based bioethical assessment, and interpretation of Islamic ontological, bioethical, and transhumanist literature to construct an ethical framework for evaluating enhancement technologies.

Results. The findings reveal that technological interventions occupy different ethical positions based on their purposes, reversibility, effects on responsibility, justice, and human dignity. Restorative technologies demonstrate the strongest compatibility with *fitrah* because they restore impaired functions and alleviate suffering. Augmentative technologies require conditional evaluation due to potential risks of inequality, dependency, and social pressure. Transformative technologies demand greater scrutiny when they alter inherited traits, cognition, embodiment, or moral accountability.

Conclusion. This study concludes that *fitrah* does not represent a prohibition against technological advancement but provides a normative framework for distinguishing human-centered innovation from interventions that may undermine dignity, responsibility, relationality, and ontological integrity.

KEYWORDS

Bioethics, Human Enhancement, Islamic Ethics.

Citation: Chai, N., Thai, A., & Krit, P. (2026). Transhumanism and the Islamic Ontological Paradigm: Evaluating the Bioethical Implications of Technological Enhancements on Human Fitrah. *Islamic Studies in the World, 3*(3), 257–275. https://doi.org/10.17323/islamicstudies.v3i3.4451

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Received: January 12, 2026

Accepted: March 15, 2026

Published: June 21, 2026

INTRODUCTION

Rapid advances in biotechnology, artificial intelligence, neurotechnology, genetic engineering, prosthetics, and human–machine integration have intensified global debates concerning the possibility of enhancing human physical, cognitive, emotional, and biological capacities beyond their conventional limits. Transhumanism emerges within this context as an intellectual and technological movement that views the

human condition as open to deliberate transformation through science and technology. Its advocates commonly emphasize extended longevity, enhanced intelligence, improved physical performance, disease resistance, and greater control over biological limitations (Draucker dkk., 2025; Luckhaus dkk., 2026; Nel & Ewuoso, 2026a). These aspirations challenge traditional philosophical and religious understandings of what constitutes a human being, particularly when technological interventions move beyond therapeutic purposes and seek to redesign capacities, identities, or embodied existence itself.

Islamic thought approaches human existence through an ontological framework in which humanity is understood as a created, morally responsible, embodied, and spiritually oriented being. The concept of fitrah occupies a central position within this framework because it refers to the primordial disposition through which human beings possess an inherent orientation toward truth, moral responsibility, and recognition of divine order (Brister dkk., 2024; Demiris dkk., 2026; Zhao dkk., 2026). Human dignity is therefore not grounded solely in intelligence, productivity, physical strength, or technological capability, but in the integrated relationship among body, soul, moral agency, accountability, and creation. Technological enhancement raises a distinctive theological and bioethical question when intervention no longer aims primarily to restore impaired function but instead seeks to alter the conditions through which human capacities and identities are constituted.

Islamic bioethics has long addressed medical intervention, preservation of life, treatment of illness, reproductive technology, organ transplantation, and genetic medicine through principles derived from the Qur'an, Sunnah, Islamic jurisprudence, and the objectives of Shariah. Emerging enhancement technologies create a more complex normative terrain because the distinction between treatment and enhancement is increasingly difficult to maintain (Alwali, 2026; Maccaro dkk., 2026; Valverde dkk., 2026). Gene editing can prevent inherited disease while potentially selecting desired traits; neural technologies can restore neurological function while also expanding cognitive performance; artificial organs can preserve life while raising questions about increasingly synthetic embodiment. These developments require renewed analysis of whether technological modification can remain compatible with fitrah and under what conditions enhancement may constitute responsible human agency rather than ethically problematic alteration.

The central problem addressed by this study concerns the absence of a clear normative boundary between permissible technological improvement and forms of enhancement that may conflict with the Islamic understanding of human nature (Kim & Kim, 2026; Lavazza & Saquella, 2026; X.-Q. Wang dkk., 2024). Islamic traditions generally support medical treatment and the pursuit of beneficial knowledge, yet enhancement technologies challenge the assumption that intervention is directed primarily toward healing. Transhumanist aspirations can involve increasing intelligence, modifying emotional states, extending lifespan dramatically, altering physical capacities, or integrating biological bodies with artificial systems. The ethical problem therefore lies in determining whether such interventions represent legitimate cultivation of human potential or a redefinition of humanity that disrupts the ontological meaning of fitrah.

The relationship between human agency and divine creation generates a second problem. Technological intervention does not automatically constitute interference with divine order, since medicine, education, and environmental modification have historically been understood as legitimate expressions of human responsibility (Akuma dkk., 2025; Joshi dkk., 2026; Talavera, 2023). Enhancement becomes philosophically more difficult when technology aims not merely to support human flourishing but to overcome characteristics regarded as constitutive of ordinary human existence. Aging, vulnerability, embodiment, cognitive limitation, and dependence are treated by some transhumanist perspectives as defects to be technologically transcended. Islamic

ontology may interpret these same conditions as dimensions of created existence within which moral responsibility, humility, dependence on God, and social obligation acquire meaning.

Justice and accessibility create another major bioethical problem because enhancement technologies are unlikely to be distributed equally (Choi dkk., 2025; Fantus dkk., 2026; Samprón dkk., 2026). Wealthier individuals or societies may gain access to cognitive enhancement, genetic modification, life extension, or advanced prosthetic augmentation while disadvantaged populations remain excluded. Such disparities could transform existing socioeconomic inequalities into biological or cognitive inequalities. Islamic ethics emphasizes justice, protection of human dignity, prevention of harm, and social responsibility, making unequal enhancement a concern that extends beyond individual autonomy. The question is therefore not only whether a person may ethically enhance particular capacities, but whether a social system built around enhancement would preserve fairness, equality, and moral accountability.

The primary objective of this study is to evaluate transhumanist technological enhancement through the Islamic ontological concept of fitrah (Merlino dkk., 2025; Shore dkk., 2026; Żurawski dkk., 2026). The research seeks to clarify how human nature is understood within Islamic philosophical, theological, and ethical traditions and to determine which elements of that understanding are most relevant to emerging enhancement technologies. Particular attention is directed toward embodiment, moral agency, human limitation, dignity, accountability, and the relationship between created nature and technological intervention. This objective allows the study to distinguish legitimate technological support for human flourishing from interventions that may fundamentally alter the normative structure of human existence.

The study also aims to analyze the bioethical implications of selected enhancement technologies, including genetic modification, cognitive enhancement, neurotechnological augmentation, artificial bodily integration, and radical life-extension strategies (Farooq, 2026; Kavadella dkk., 2024; Paleri & Hens, 2025). Each category is examined according to its purpose, reversibility, expected benefits, risks, effects on identity, and potential implications for individual and social justice. The research does not assume that all enhancement technologies are either prohibited or permissible. Its purpose is to establish a differentiated ethical assessment capable of distinguishing therapeutic restoration, functional augmentation, elective optimization, and transformative enhancement.

A further objective is to construct an Islamic bioethical framework capable of evaluating future enhancement technologies that may not yet be fully developed. The proposed framework integrates fitrah, human dignity, moral responsibility, justice, prevention of harm, benefit, and the objectives of Shariah into a structured evaluative model (Ayuso dkk., 2026; Callahan dkk., 2025; Salinas Chaparro dkk., 2025). The expected contribution is a set of normative criteria that can guide scholars, clinicians, policymakers, technologists, and Muslim communities when evaluating technologies that blur traditional boundaries between treatment and enhancement. The study therefore seeks both philosophical clarity and practical relevance in anticipating ethical challenges associated with rapidly evolving human-enhancement technologies.

Existing transhumanist scholarship has extensively debated human enhancement, posthuman identity, technological evolution, artificial intelligence, cognitive augmentation, longevity, and genetic modification (Bubeck dkk., 2026; Pérez-Edgar dkk., 2025; Potz, 2026). Much of this literature is grounded in secular liberalism, utilitarian ethics, technological optimism, or posthuman philosophy. Human autonomy, individual choice, enhancement capacity, and maximization of well-being frequently occupy central positions in these discussions. Limited attention has been given to ontological frameworks in which human value is not reducible to autonomy, performance, or self-

design. Islamic perspectives remain comparatively underrepresented in broader philosophical debates concerning the meaning and limits of technological enhancement.

Islamic bioethical scholarship has addressed biotechnology, genetic engineering, reproductive intervention, cloning, organ transplantation, artificial intelligence, and medical treatment through legal and ethical principles (Ansheila dkk., 2026; Nel & Ewuoso, 2026b; Roldán-Merino dkk., 2025). Much of this research focuses on questions of permissibility, necessity, benefit, harm, or jurisprudential classification. The ontological dimension of fitrah is less frequently developed as a systematic framework for evaluating enhancement technologies. This creates a conceptual gap between Islamic legal reasoning about specific technologies and deeper philosophical questions concerning how technological transformation affects the meaning of being human. A bioethical approach grounded in ontology can provide greater coherence across technologies that may otherwise be evaluated separately.

Research examining Islam and transhumanism often concentrates on broad compatibility or incompatibility between religious belief and technological enhancement. Binary approaches can obscure important distinctions among therapeutic intervention, restorative enhancement, elective augmentation, and radical transformation (Hanh & Nga, 2025; Robleda dkk., 2025a, 2025). A technology used to restore lost hearing raises different ethical questions from one designed to create capacities beyond the normal human range, even when both involve similar technical mechanisms. Limited scholarship has developed a graded evaluative model capable of accounting for purpose, proportionality, identity, justice, and effects on fitrah. The present study addresses this gap by proposing a multidimensional framework rather than a simple permissibility-versus-prohibition dichotomy.

The principal novelty of this study lies in positioning fitrah as an ontological criterion for evaluating technological enhancement rather than treating it merely as a theological concept of innate disposition (Martin-Sanchez dkk., 2023; Nissen dkk., 2026; Yang, 2026). The proposed approach interprets fitrah as a normative framework encompassing embodiment, moral agency, relational dependence, dignity, spiritual orientation, and accountability. Technological enhancement can therefore be assessed according to whether it supports, distorts, replaces, or fundamentally reconfigures these dimensions. This conceptualization allows Islamic bioethics to engage transhumanism at the level of human ontology rather than limiting analysis to isolated legal judgments about individual technologies.

A second element of novelty involves distinguishing between restorative, augmentative, and transformative technologies according to their relationship with fitrah. Restorative intervention seeks to recover impaired human functioning, augmentative intervention extends existing capacities within recognizable human boundaries, and transformative intervention aims to redefine fundamental characteristics of human embodiment or identity. Such distinctions make it possible to avoid both technological rejectionism and unrestricted enhancement. The framework recognizes that human beings legitimately use knowledge and technology to improve life while maintaining that not every technologically achievable modification is ethically equivalent. Ethical evaluation therefore depends on purpose, proportionality, effects on moral agency, justice, and the continuity of human identity.

The justification for this research rests on the accelerating pace of technological innovation and the likelihood that Muslim societies will increasingly encounter enhancement technologies in medicine, education, defense, employment, reproduction, and everyday life. Ethical deliberation undertaken only after technologies become socially entrenched risks reducing religious analysis to reactive approval or rejection. A proactive Islamic bioethical framework can contribute to policy

formation, clinical governance, technological design, and public deliberation before enhancement practices become normalized. The study is positioned to contribute to Islamic philosophy, bioethics, transhumanism studies, philosophy of technology, theology, and health ethics by demonstrating that the central question is not whether humans may use technology to improve themselves, but how technological transformation can occur without undermining the ontological, moral, and spiritual dimensions through which Islam understands human fitrah.

RESEARCH METHODOLOGY

This study employed a qualitative philosophical-normative research design to examine the bioethical implications of technological enhancement through the Islamic ontological concept of fitrah. The design integrated conceptual analysis, normative ethics, Islamic philosophical reasoning, and critical bioethical interpretation (AlJahsh, 2024; Subías-Beltrán dkk., 2025; R. H. Wang dkk., 2023). This approach was selected because the central research problem concerns not only whether specific enhancement technologies are technically possible or legally permissible, but also whether they remain compatible with the Islamic understanding of human nature, dignity, embodiment, moral agency, spiritual responsibility, and accountability before God. The study therefore moved beyond descriptive analysis of technological development toward an evaluation of the normative boundaries between therapeutic intervention, human augmentation, and transformative enhancement.

The analytical framework combined Islamic ontology with contemporary bioethical principles. Human fitrah was examined in relation to embodiment, moral freedom, spiritual orientation, relational dependence, vulnerability, dignity, and responsibility. These dimensions were interpreted alongside Islamic ethical principles concerning benefit (maslahah), prevention of harm (darar), justice (‘adl), preservation of human dignity (karamah), necessity (darurah), and the objectives of Shariah (maqasid al-shariah). Contemporary bioethical concepts, including autonomy, beneficence, nonmaleficence, justice, proportionality, and informed consent, were incorporated as comparative analytical categories rather than as substitutes for Islamic normative reasoning.

The research adopted a graded rather than binary evaluative model. Technological interventions were classified into restorative, augmentative, and transformative categories according to their intended purpose and their effects on ordinary human capacities. Restorative technologies were defined as interventions intended primarily to recover lost or impaired functions, augmentative technologies as interventions designed to strengthen existing capacities beyond ordinary therapeutic need, and transformative technologies as interventions capable of substantially altering human embodiment, identity, lifespan, cognition, or moral agency. This distinction enabled the study to avoid treating all forms of enhancement as ethically identical and provided a more precise basis for determining how different technologies interact with the concept of fitrah.

RESULT AND DISCUSSION

The comparative analysis of Islamic ontological sources, contemporary bioethical scholarship, transhumanist arguments, and selected enhancement technologies revealed three distinct levels of technological intervention: restorative, augmentative, and transformative. Restorative technologies showed the strongest compatibility with the Islamic bioethical framework because their primary purpose was to recover impaired functions, reduce suffering, or protect life without substantially redefining human identity. Augmentative technologies generated more conditional judgments because their ethical acceptability depended on proportionality, justice, risk, purpose, and effects on moral agency. Transformative technologies generated the greatest ontological concern when they

sought to redesign fundamental features of cognition, embodiment, heredity, lifespan, or human–machine identity beyond therapeutic necessity.

Table 1. Comparative Bioethical Classification of Selected Human Enhancement Technologies

Technology	Primary Category	Potential Benefit	Principal Ethical Concern	Compatibility with *Fitrah*
Therapeutic somatic gene editing	Restorative	Prevention or treatment of serious disease	Off-target effects and access inequality	High with safeguards
Advanced therapeutic prosthetics	Restorative/Augmentative	Recovery of mobility and bodily function	Transition from restoration to optimization	High–Moderate
Neurostimulation for neurological disorders	Restorative	Recovery of neurological function	Personality and cognitive side effects	High with proportionality
Cognitive enhancement for healthy individuals	Augmentative	Improved memory or attention	Fairness, dependency, identity, coercion	Conditional
Brain–computer enhancement	Augmentative/Transformative	Expanded communication and cognition	Privacy, agency, dependency, identity	Conditional–Low
Germline enhancement for preferred traits	Transformative	Possible enhancement of inherited capacities	Irreversibility, lineage, consent, inequality	Low
Radical life-extension technologies	Transformative	Extended lifespan and disease resistance	Social justice, meaning of mortality, demographic effects	Highly conditional
Extensive human–machine integration	Transformative	Expanded physical or cognitive capabilities	Continuity of human identity and agency	Low–Conditional

The secondary evidence showed that Islamic ethical evaluation did not support a simple opposition between technological intervention and human fitrah. Technologies intended to restore health or compensate for impairment were generally more compatible with the preservation of life, intellect, dignity, and human flourishing. Ethical difficulty increased when enhancement shifted from restoring a damaged capacity toward optimizing healthy individuals or redefining ordinary human limitations. The decisive distinction was therefore not whether technology altered the body, since medicine inevitably modifies bodily conditions, but whether the modification preserved human moral agency and dignity while remaining proportionate to legitimate benefit.

The stronger ethical acceptability of restorative technologies can be explained by their alignment with established Islamic commitments to treatment, preservation of life, alleviation of suffering, and responsible use of knowledge. Restoring mobility through advanced prosthetics or correcting a serious genetic disorder does not necessarily imply dissatisfaction with divine creation. Such interventions can be interpreted as exercises of stewardship in which human knowledge is used to protect capacities necessary for flourishing and moral responsibility. Technological alteration therefore does not become ethically problematic merely because it changes biological conditions.

The ethical uncertainty surrounding augmentation emerged because enhancement introduces purposes that exceed conventional treatment. Cognitive enhancement, elective neurostimulation, or technologies designed to expand healthy capacities can produce real benefits, yet their justification becomes more dependent on context. Questions concerning competitive pressure, unequal access, dependency, personality alteration, and social expectations become increasingly relevant. The Islamic ontological framework therefore evaluates augmentation not only by asking whether an enhancement works, but also whether the desired improvement serves a morally defensible conception of human flourishing.

The analysis identified six recurring criteria that shaped the ethical status of enhancement technologies: therapeutic purpose, proportionality of benefit and harm, preservation of moral agency, continuity of personal identity, distributive justice, and effects on human relationality. Technologies that performed strongly across these criteria were more compatible with fitrah, while technologies that compromised several dimensions simultaneously required greater ethical restriction. Moral agency emerged as especially significant because human beings within the Islamic ontological paradigm are not merely biological organisms but accountable subjects whose capacities for intention, judgment, and responsibility carry normative significance.

Table 2. Fitrah-Based Criteria for Evaluating Technological Enhancement

Ethical Criterion	Guiding Question	Positive Indicator	Ethical Warning
Therapeutic purpose	Does the technology restore or protect meaningful human function?	Healing and rehabilitation	Enhancement without clear benefit
Proportionality	Do expected benefits outweigh foreseeable harms?	Controlled and reversible benefit	Severe or irreversible uncertainty
Moral agency	Does the individual retain meaningful judgment and responsibility?	Preserved autonomy and accountability	Manipulated cognition or impaired agency

Personal identity	Does enhancement preserve continuity of the human subject?	Functional assistance	Radical alteration of selfhood
Justice	Is access fair and socially responsible?	Equitable distribution	Biological or cognitive class division
Relationality	Does technology preserve meaningful human dependence and solidarity?	Enhanced participation	Extreme isolation or technological dependency
Dignity	Is human worth treated as intrinsic?	Respect independent of performance	Worth tied to enhanced capability
Intergenerational responsibility	Are future persons affected irreversibly?	Limited inheritable risk	Unconsented germline transformation

The distinction between reversible and irreversible interventions also proved important. Technologies that could be discontinued, adjusted, or clinically reversed allowed greater room for ethical experimentation because unforeseen harms could potentially be contained. Germline modification and certain forms of radical biological transformation created stronger concerns because their consequences could extend to future generations who could not consent. Irreversibility therefore amplified ethical scrutiny even when enhancement promised substantial benefits.

Normative inference from the combined evidence indicates that fitrah should not be interpreted as a prohibition against altering human biology. Such an interpretation would be difficult to reconcile with established Islamic acceptance of medical treatment, surgery, prosthetic restoration, and other interventions that modify bodily conditions. The more defensible inference is that fitrah functions as an ontological boundary concerning the preservation of human moral orientation, dignity, accountability, and integrated embodied existence. Technological change becomes ethically questionable when it undermines these constitutive dimensions rather than simply because it modifies biological structure.

A second normative inference concerns the escalating burden of justification across the three technological categories. Restorative interventions require ordinary assessment of benefit, harm, necessity, and consent. Augmentative interventions require additional justification concerning fairness, social pressure, identity, and the meaning of the capacity being enhanced. Transformative interventions require the highest threshold because they may alter the conditions under which humanity itself is understood. The framework therefore supports graduated ethical scrutiny rather than either unrestricted technological optimism or categorical technological rejection.

A clear relationship emerged between enhancement intensity and ontological risk. Greater technological capacity did not automatically produce greater ethical concern, but ethical risk increased when greater capacity was accompanied by irreversibility, alteration of moral agency, inherited consequences, or dependence on technological systems. An advanced prosthetic that restores movement could involve sophisticated human–machine integration while remaining broadly compatible with fitrah. A less technically dramatic intervention that permanently

manipulates personality or moral decision-making could generate stronger ontological concerns because its effects reach the conditions of accountable personhood.

A second relationship appeared between individual benefit and distributive justice. Enhancement may offer substantial benefit to a particular person while simultaneously creating broader social harms when access is restricted to privileged groups. Cognitive or genetic enhancement available only to wealthy populations could transform economic inequality into inherited biological advantage. Islamic bioethical evaluation therefore cannot be limited to autonomous individual choice. The moral status of enhancement also depends on its effects on solidarity, equality, social opportunity, and the dignity of those who remain unenhanced.

The first representative case involved therapeutic gene editing intended to correct a severe inherited disorder through somatic intervention. The technology offered a realistic possibility of preventing serious disability without transmitting engineered modifications to future generations. Fitrah-based evaluation showed strong compatibility when the intervention pursued therapeutic restoration, maintained personal identity, involved informed consent, and demonstrated a proportionate relationship between expected benefit and medical risk. Ethical reservations remained regarding affordability, long-term safety, and unequal access, but these concerns did not fundamentally challenge the ontological status of the intervention.

The second representative case concerned germline editing intended to increase desired cognitive capacities in future children. The intervention differed substantially because its purpose was optimization rather than treatment and its modifications would affect descendants unable to consent. Enhancement could also normalize the idea that intelligence, achievement, or competitive performance determines superior human value. The framework identified concerns involving lineage, distributive justice, parental control over future identity, social coercion, and the commodification of desirable human traits. This case therefore generated significantly greater tension with the Islamic ontological understanding of intrinsic dignity and moral equality.

The therapeutic gene-editing case demonstrates why alteration of biological material cannot itself serve as the decisive ethical criterion. Both therapeutic and enhancement-oriented gene editing may employ similar scientific mechanisms, yet their purposes and consequences differ substantially. Correcting a pathogenic mutation seeks to enable ordinary human functioning, while selecting enhanced capacities introduces normative judgments about which forms of human existence deserve preference. Islamic bioethical assessment therefore requires attention to intention, purpose, proportionality, and social consequences rather than focusing exclusively on the technological procedure.

The germline-enhancement case explains why transformative technologies generate concerns extending beyond bodily safety. The ethical issue is not simply whether the procedure causes medical harm but whether human beings become objects of design according to preferences established by others. Such transformation can shift parenthood from receiving and nurturing a person toward increasingly determining desirable characteristics before birth. The possibility of designing competitive advantage also raises questions about whether human dignity remains intrinsic or becomes connected to engineered performance. These concerns place germline enhancement at the intersection of bioethics, ontology, justice, and intergenerational responsibility.

The overall findings indicate that Islamic bioethics can engage constructively with transhumanist technologies without adopting either unrestricted enhancement or blanket rejection. Fitrah does not demand biological immutability; it provides a normative account of what should remain morally significant when technology alters human capacities. Restoration of impaired function is generally compatible with this account, while augmentation requires conditional

evaluation and transformative enhancement demands substantially stronger justification. The ethical boundary becomes increasingly visible when technology shifts from supporting human agency toward redesigning the conditions of agency, identity, and intrinsic dignity.

The findings also suggest that the central disagreement between transhumanism and the Islamic ontological paradigm concerns the meaning of human flourishing rather than technology itself. Transhumanist approaches may interpret limitation as a condition to be progressively overcome, while Islamic ontology can recognize vulnerability, dependence, mortality, and embodied limitation as dimensions of morally meaningful human existence. Technology remains ethically valuable when it reduces unnecessary suffering and enables responsible flourishing, but enhancement becomes problematic when human worth is reconstructed around technological superiority or liberation from the very conditions that sustain accountability, relationality, humility, and spiritual orientation. Human fitrah therefore functions not as an obstacle to technological progress but as a normative criterion for determining what kind of progress remains genuinely human.

The findings demonstrate that technological enhancement cannot be evaluated adequately through a simple opposition between acceptance and prohibition. The analysis revealed a graded ethical structure in which restorative, augmentative, and transformative technologies occupy different normative positions. Restorative interventions generally showed the strongest compatibility with the Islamic ontological paradigm because they seek to recover impaired functions, alleviate suffering, or protect human life without fundamentally redefining human identity. Augmentative technologies required greater scrutiny because their purposes extend beyond therapeutic restoration toward improving capacities that are already functional. Transformative technologies generated the greatest ethical concern because they may alter embodiment, cognition, heredity, moral agency, or the continuity of human identity itself.

The results also show that fitrah should not be interpreted as biological immutability. Islamic acceptance of medicine, surgery, prosthetic intervention, and other forms of therapeutic modification makes it difficult to sustain the claim that every alteration of the human body constitutes an impermissible disturbance of creation. The more defensible interpretation positions fitrah as an ontological and normative framework concerned with human dignity, moral responsibility, embodied existence, spiritual orientation, relationality, and accountability. Technological intervention becomes problematic when it undermines these dimensions rather than merely changing biological or functional conditions.

The comparative analysis further identified moral agency as one of the most important criteria in distinguishing ethically acceptable enhancement from ontologically disruptive transformation (Alves dkk., 2025; Cheng & Rokop, 2025; Pevkur & Lubi, 2025). Technologies that restore or strengthen capacity while preserving meaningful human judgment and responsibility generated fewer ethical concerns than interventions capable of manipulating personality, emotional disposition, cognition, or decision-making at a fundamental level. Human agency matters because Islamic ontology understands persons not simply as biological systems but as morally accountable beings. Enhancement that weakens the conditions of accountability therefore raises deeper questions than enhancement that merely improves physical performance.

The findings also revealed that distributive justice substantially changes the ethical meaning of enhancement. A technology may offer significant benefits to an individual while producing broader social consequences through unequal access, competitive pressure, or inherited advantage (Millett dkk., 2026; Palmour dkk., 2026; Rueda, 2023). Cognitive enhancement, genetic modification, and longevity technologies could intensify existing socioeconomic inequalities if

available only to privileged groups. Islamic bioethical assessment therefore cannot remain confined to individual autonomy or personal benefit. The moral evaluation of enhancement must also consider how technological access reshapes solidarity, equality, human dignity, and the social meaning of remaining unenhanced.

The findings partially converge with transhumanist scholarship that interprets technology as a legitimate means of overcoming disease, disability, cognitive limitation, and unnecessary suffering. Islamic ethical reasoning does not require rejecting these aspirations categorically. Therapeutic gene editing, restorative neurotechnology, and advanced prosthetics can be understood as extensions of medicine when they protect life and support functional recovery (Bankins dkk., 2025; Qasim dkk., 2024). The present analysis differs from stronger transhumanist positions, however, when enhancement shifts from alleviating suffering toward redefining human flourishing primarily through expanded technological capability.

The results also resonate with contemporary bioethical debates concerning the distinction between treatment and enhancement. Secular bioethics has long recognized that the boundary is conceptually unstable because the same technology can serve therapeutic and non-therapeutic purposes. The present study confirms this difficulty but adds an ontological dimension by asking not only whether an intervention exceeds medical necessity, but whether it changes the moral conditions of human existence. Purpose, proportionality, reversibility, agency, identity, and justice therefore become more important than a rigid treatment-enhancement binary.

The findings extend Islamic bioethical scholarship that has traditionally evaluated biotechnology through maslahah, prevention of harm, necessity, and maqasid al-shariah. These principles remain indispensable, but they may be insufficient when technologies begin to alter human capacities at the level of identity, agency, or heredity. The present analysis contributes by positioning fitrah as a deeper ontological criterion that complements jurisprudential reasoning. Such an approach helps distinguish between interventions that preserve human flourishing and those that may restructure the meaning of humanity itself.

The results differ from interpretations that reduce fitrah to an argument against modifying the body. Such a view risks collapsing Islamic bioethics into technological conservatism and ignores the long-standing acceptance of medical intervention. The present framework treats technological change as ethically neutral in itself and evaluates its moral status according to purpose and consequence. This position avoids both unrestricted technological optimism and generalized religious resistance. Islamic ontology therefore emerges as a critical framework for judging technology rather than as a blanket prohibition against innovation.

The findings signify that the central bioethical question raised by transhumanism concerns the definition of human flourishing. Enhancement becomes ethically controversial not simply because it increases capability, but because it can reshape what societies understand as a successful or valuable human life. A culture that increasingly equates intelligence, physical performance, longevity, or technological integration with superior human worth may weaken the principle of intrinsic dignity. Islamic ontology challenges such a trajectory by locating human value in created dignity and moral responsibility rather than measurable performance.

The results also signify that human limitation possesses ethical meaning. Transhumanist narratives often present vulnerability, aging, dependence, and mortality primarily as problems to be technologically overcome. Islamic ontology allows a more complex interpretation in which these conditions can also shape humility, compassion, solidarity, patience, responsibility, and awareness of human dependence. This does not imply that suffering should be preserved when it can be

treated. The distinction lies between relieving unnecessary suffering and imagining that human flourishing requires the progressive abolition of all limitation.

The importance of moral agency signifies that enhancement technologies may eventually challenge assumptions about personal responsibility. Neurotechnologies capable of modifying emotional states, motivation, memory, or decision-making raise questions about whether actions remain attributable to a stable moral subject. Islamic ethics depends heavily on intention, responsibility, and accountability, making agency-altering technologies particularly significant. A technologically enhanced person may remain biologically human while experiencing changes that complicate the moral continuity through which responsibility is understood.

The findings further signify that technological enhancement is a social project rather than merely a personal choice. Individual autonomy cannot capture the full ethical landscape because enhancement decisions are shaped by markets, institutions, competitive environments, employers, governments, and cultural expectations. Technologies initially presented as optional may eventually become socially expected. The right to remain unenhanced therefore becomes as important as the freedom to pursue enhancement. Fitrah-based bioethics must consequently address coercive social normalization in addition to individual consent.

The principal theoretical implication is that Islamic bioethics should move beyond case-by-case permissibility toward a more coherent ontology of technological intervention. Questions about gene editing, neural augmentation, life extension, and human–machine integration share deeper concerns regarding identity, dignity, agency, justice, and human purpose. A fitrah-based framework can connect these issues within a single normative structure. Such integration would strengthen Islamic engagement with rapidly evolving technologies whose ethical implications may exceed existing legal categories.

The clinical implication is that therapeutic innovation should remain distinguishable from enhancement-oriented optimization wherever possible. Medical institutions can support technologies designed to restore meaningful human function while applying greater scrutiny to interventions intended primarily to produce competitive advantage or non-therapeutic optimization. Clinical ethics committees should consider not only procedural safety and consent but also identity, agency, long-term dependency, and social consequences. The threshold for ethical justification should rise as intervention moves further from treatment toward transformation.

The policy implication concerns distributive justice. Governments and healthcare systems should anticipate the possibility that enhancement technologies could deepen inequality by creating privileged populations with greater biological, cognitive, or longevity advantages. Regulatory frameworks should therefore assess accessibility, social coercion, and intergenerational consequences alongside technical safety. Public policy should avoid allowing markets alone to determine which human capacities become technologically optimized. Islamic principles of justice and dignity provide strong grounds for resisting social systems in which enhancement becomes a marker of superior status.

The technological-design implication is that engineers and developers should incorporate human agency and dignity into the architecture of enhancement systems. Brain–computer interfaces, neurostimulation devices, artificial organs, and AI-mediated cognitive tools should be designed to preserve meaningful user control and reversibility whenever possible. Technologies that create irreversible dependency or obscure the boundary between human decision and algorithmic influence require stronger ethical safeguards. Responsible innovation should therefore treat moral agency as a design objective rather than an external philosophical concern.

The stronger compatibility of restorative technologies can be explained by their relationship with established moral purposes. Islamic ethics recognizes the protection of life, intellect, bodily function, and human welfare as legitimate objectives. Technologies that restore lost capacity operate within this familiar therapeutic logic. Their purpose is not to redefine what a human being should become but to enable individuals to recover capacities necessary for ordinary flourishing. Ethical concerns remain, but they are generally concerns of safety, access, proportionality, and consent rather than fundamental ontology.

The increased concern surrounding augmentation can be explained by the shift from healing toward optimization. Once technology is used to improve healthy individuals, questions of necessity become less decisive and social comparison becomes more important. Enhancement can alter expectations about what counts as normal performance and create pressure on others to follow. A technology that begins as an optional advantage may become an implicit requirement in education, employment, or military settings. Ethical analysis must therefore account for the social consequences of competitive normalization.

The strongest concern surrounding transformative technologies can be explained by their effects on continuity and inheritance. Germline editing, radical life extension, and extensive human–machine integration can create consequences that extend beyond an individual user. Future generations may inherit modifications they did not choose, while society may be required to adapt institutions around fundamentally altered forms of human capability. These features increase the moral burden because mistakes or inequalities may become persistent rather than reversible. Transformative enhancement consequently raises questions about stewardship across generations, not merely present-day individual preference.

The emphasis on fitrah emerged because conventional bioethical principles alone may not fully address these ontological questions. Autonomy, beneficence, nonmaleficence, and justice can evaluate many practical consequences, but they do not always explain why preserving certain dimensions of humanity might matter independently of individual preference. Fitrah introduces an account of human existence that connects freedom with responsibility, embodiment with spirituality, and capability with accountability. This framework explains why technological success cannot serve as the sole measure of moral progress.

Future Islamic bioethical scholarship should develop clearer operational criteria for applying fitrah to emerging technologies. The concept must remain sufficiently precise to guide decision-making without becoming a vague theological label used to prohibit unfamiliar innovation. Scholars should identify which dimensions of fitrah are ethically fundamental, which are adaptable, and how conflicts among dignity, benefit, necessity, and justice should be resolved. Greater conceptual precision would improve consistency across different technological cases.

Future research should also examine how Muslim communities understand enhancement technologies empirically. Philosophical analysis can establish normative categories, but public attitudes, professional practices, and lived religious concerns may reveal additional ethical dimensions. Qualitative interviews with scholars, clinicians, engineers, patients, and users could clarify how fitrah, enhancement, and human dignity are understood in practice. Comparative studies across Muslim-majority societies would also reveal how cultural, legal, and technological contexts shape bioethical judgment.

Future interdisciplinary work should connect Islamic bioethics more closely with neuroscience, genetics, AI, engineering, and regulatory science. Ethical analysis that remains disconnected from technical realities risks evaluating imagined technologies rather than actual systems. Collaboration with scientists can clarify reversibility, uncertainty, risk, and plausible future

applications. Religious scholars can simultaneously provide normative perspectives capable of challenging assumptions embedded within technological design. Such dialogue would allow ethical reasoning to develop alongside innovation rather than after social adoption has already occurred.

Future policy frameworks should adopt anticipatory governance for human enhancement. Regulatory institutions should classify technologies according to restorative, augmentative, and transformative functions while applying progressively stronger ethical scrutiny as ontological and social consequences increase. Public deliberation should include questions of justice, accessibility, agency, intergenerational responsibility, and the right to remain unenhanced. The most constructive Islamic response to transhumanism is therefore neither rejection nor unconditional acceptance, but the development of a principled framework in which technological progress remains subordinate to human dignity, moral responsibility, social justice, and the preservation of the ontological integrity expressed through fitrah.

CONCLUSION

The most important finding of this study is that technological enhancement cannot be evaluated within Islamic bioethics through a simple binary distinction between permissibility and prohibition. The analysis demonstrates that restorative, augmentative, and transformative technologies occupy different ethical positions depending on their purposes, consequences, reversibility, effects on moral agency, and relationship with human fitrah. Restorative interventions generally show the strongest compatibility with the Islamic ontological paradigm because they seek to recover impaired functions, protect life, and reduce suffering without fundamentally redefining human identity. Augmentative technologies require more conditional assessment, particularly when they introduce concerns regarding dependency, competitive pressure, inequality, or changes in personal identity. Transformative technologies demand the highest ethical scrutiny when they alter inherited characteristics, embodied existence, moral agency, or the conditions through which human beings remain accountable moral subjects. Fitrah therefore functions not as a prohibition against biological modification but as a normative boundary for distinguishing technologies that support human flourishing from those that risk redefining the ontological meaning of humanity.

The principal contribution of this research is conceptual, supported by a philosophical-normative methodological framework that integrates Islamic ontology, fitrah, contemporary bioethics, and transhumanist philosophy. The study advances a graded model of technological enhancement that distinguishes restorative, augmentative, and transformative interventions while evaluating each category through human dignity, moral agency, proportionality, justice, relationality, intergenerational responsibility, and maqasid al-shariah. This approach moves Islamic bioethical analysis beyond reactive judgments concerning individual technologies and provides a coherent framework capable of addressing emerging innovations whose implications extend beyond conventional medical treatment. Methodologically, the combination of conceptual clarification, comparative argument analysis, case-based normative evaluation, and cross-disciplinary interpretation offers a systematic means of examining technological enhancement without reducing Islamic ethical reasoning either to technological rejectionism or unrestricted acceptance. The framework contributes to Islamic philosophy, bioethics, transhumanism studies, philosophy of technology, and emerging debates on responsible human enhancement.

The study is limited by its philosophical and literature-based design, which cannot independently determine how Muslims, healthcare professionals, technologists, policymakers, or religious scholars will interpret and negotiate enhancement technologies in actual social contexts. The rapid development of gene editing, neurotechnology, artificial intelligence, brain–computer

interfaces, synthetic biology, and longevity science may also generate applications whose ethical characteristics cannot yet be anticipated fully. Future research should combine normative analysis with empirical bioethics through interviews, expert panels, comparative case studies, and cross-cultural surveys involving Islamic scholars, scientists, clinicians, engineers, patients, and technology users. Further investigation should develop operational indicators for assessing the compatibility of emerging technologies with fitrah and examine difficult questions surrounding artificial cognitive agency, heritable enhancement, radical longevity, technologically mediated personality modification, and the right to remain unenhanced. Such research would strengthen an anticipatory Islamic bioethics capable of guiding technological innovation while preserving human dignity, moral responsibility, social justice, and the ontological integrity of human fitrah.

DECLARATION OF AI AND AI ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

During the preparation of this work, the authors used ChatGPT (OpenAI) to assist with English language refinement, grammatical correction, academic writing structure, and improving the clarity and coherence of the manuscript. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

ACKNOWLEDGEMENT

This is a short text to acknowledge the contributions of specific colleagues, institutions, or agencies that aided the efforts of the authors.

AUTHORS' CONTRIBUTION

Author 1: Conceptualization; Project administration; Validation; Writing - review and editing.

Author 2: Conceptualization; Data curation; In-vestigation.

Author 3: Data curation; Investigation.

DECLARATION OF COMPETING INTEREST

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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