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Can We Live Longer and Should We? Radical Life Extension, Biomedicine, and Islamic Bioethics

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Abstract: This article explores several interrelated questions: First, is biomedicine, in line with transhumanist impulses, 'medicalizing' natural life processes such as aging into a 'disease' to be overcome? Second, does biomedical evidence indicate the possibility of radical life extension, and what does the Islamic scripture say of this possibility? Are these two domains of knowledge in conflict? Third, if pushing human longevity is scientifically possible, should we do so? The essay begins with an account of transhumanism and its relationship to biomedicine and contemporary healthcare. Next, the biomedicalization of the aging phenomenon is introduced to allow for analyzing the role of biomedicine in its attempt to 'transcend' aging, thereby radically enhancing longevity. Then we juxtapose and critically analyze scientific and scriptural evidence on the changes in average life expectancy over time, to demonstrate whether the two domains of knowledge can be aligned or whether one source of knowledge must be privileged over the other. The final section attends to the moral boundaries of medical practice. Here, we introduce the reader to ethical guideposts such as the theological notion of changing the creation of God, which is used to proscribe human enhancement and alteration activities. Lastly, we outline an intervention that links various Islamic moral sciences to theoretical, practical and applied bioethical deliberation processes.

Keywords: Life enhancement; extreme longevity; Islamic epistemology; Islam and science

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Transhumanism: A Brief Introduction

Transhumanism has been variably described as an ideology, a social movement, and a set of processes (Mobayed, 2017). Linked to Enlightenment philosophies and ones that hold empirical science as key to human progress, transhumanism entered popular discourses in the 1980s and 1990s (Manzocco, 2019) through the establishment of the World Transhumanist Association, the publication of manifestos, and several high-profile cultural events and conferences (Bostrom, 2014). [1] Transhumanism is best viewed as a loose socio-political and intellectual movement with various thought leaders, including Nick Bostrom, an Oxford University-based philosopher; Natasha Vita-More, an American designer and artist, and James Hughes, an American bioethicist and associate provost at the University of Massachusetts in Boston. Allied with this movement are think-tanks such as ThinkH+ (n.d.), and academic centers such as the Future of Humanity Institute (n.d.) and the Institute for Ethics and Emerging Technology. Furthermore, technology companies, such as Elon Musk's *Neuralink* (2024) and Google's *DeepMind*, participate in projects that emerge from transhumanist ideas.

In its boldest version, transhumanism aspires to a post-human future where humanity *trans*itions from its current species and *trans*cends into some grander form of life melded with or wholly ensconced within technology. While not all adherents aim at such a future, they share the objective of redressing human frailty through technology; human biology is seen as limiting life pursuits. As Bostrom notes, transhumanism is about "evaluating the opportunities for enhancing the human condition… opened up by the advancement of technology," including the "radical extension of human health-span, eradication of disease… augmentation of human intellectual, physical, and emotional capacities" and possibly "creating superintelligent machines… that could profoundly alter the human condition" (Bostrom, 2005).

Transhumanists claim continuity with European Enlightenment thought including rationalism, humanism, and scientism. Hughes notes that transhumanism is "an ideological descendant of the Enlightenment,"

[1] For example, the World Transhumanist Association was established in 1998 and is now known as Humanity+; Natasha Vita-More, a strategic designer and artist, published "The Transhuman Manifesto" in 1983 and "The Transhuman Arts Statement" in 1992 and displays of her transhuman artwork occurred at venues such as the National Centre for Contemporary Arts in Russia and at the Telluride Film Festival shortly thereafter; Nick Bostrom, a philosopher, published *Transhumanist Frequently Asked Questions* in 1999 and later founded the Future of Humanity Institute at Oxford University in 2005; Max More, a philosopher, published his seminal essay, "Transhumanism: Toward a Futurist Philosophy" in 1990, and founded the Extropy Institute which held conferences dedicated to transhumanism in the 1990s; short essays such as "A Manifesto for Cyborgs" (1985) by Donna Haraway, a scholar in the fields of science, technology, and feminist studies, and "The Post-Human Movement Manifesto" (1988) by Steve Nichols, a scientist.

and its core belief is that "science can be used to transcend the limitations of the human body and brain" (Hughes, 2010). Max More, another transhumanist philosopher, adds that transhumanism imports its optimism for curtailing human finitude through science-based developments and its valuation of this life rather than a supernatural afterlife from secular humanism (More, 1990). Consequently, organized religion is viewed with disdain. Illustratively, Bostrom exclaims, "empirical science and critical reason—rather than revelation and religious authority—are ways of learning about the natural world and our place within it and of providing a grounding for morality" (Bostrom, 2005). Not surprisingly, over 90 percent of the World Transhumanist Association's members identify as atheists (Jackson, 2020). Nonetheless, there have been dialogues between transhumanism and some religious voices, particularly Christian ones around shared ideals of relieving human suffering and improving the self.[2]

Three principal technology-mediated endeavors are, arguably, vital to the transhumanist vision. The first involves genetic engineering through which inborn diseases are eliminated, aging-related physiological declines are curtailed, and the body and mind are enhanced for optimal functioning and/or to push beyond species-specific capacity limitations. The second revolves around physical modifications that restore previously lost biological functioning or augment it. A cyborg may represent the ultimate end of such endeavor. Prosthetics that restore eyesight while also enabling "seeing" beyond the visible spectrum, as well as those that allow the user to "hear" colors, mark moves toward becoming a transhuman. The third endeavor, mind-uploading, targets death directly. The aspirational goal is to copy and download one's mind—the aspect of one's being that is held to be the repository of one's identity—onto a mechanical device or a synthetic body, thereby allowing one to live on forever. While mind uploading may be the realm of science fiction, some aspects of the genetic engineering and body modification envisaged by transhumanists are part of current biomedical research and practice. Research on genetic and genomic therapies abounds, and some clinical trials target aging through gene editing (Belete, 2021).

Connections between Transhumanism, Biomedicine, and Contemporary Healthcare

Although the term biomedicine was first used in 1923 to describe medical and scientific research related to radioactive materials, it now

[2] An August 2005 special issue of the *Journal of Evolution and Technology* titled "Religion and Transhumanism" documents such engagements (Campbell and Walker 2005); a book section titled "Philosophy and Religion" in *The Transhumanism Handbook* edited by Newton Lee (2019) also details religious outlooks that may overlap with transhumanism.

represents "the umbrella theoretical framework for most health science and health technology work done in academic and government settings [globally]" (Valles, 2020). It signifies a theoretical framework together with a body of multidisciplinary knowledge used to identify and address human maladies. Like transhumanism, biomedicine inherits its views on human nature and what is knowable from European Enlightenment thought (Ali, 2018). Both systems share a naturalistic account of the human, rely on empirical approaches to glean truths, and hope in technology-infused solutions to human maladies. As such, healthcare practices growing out of the biomedical paradigm are susceptible to becoming instrumentalized for transhumanist goals.

Social epidemiologist Nancy Krieger delineates three hallmark features of biomedicine's approach to human maladies. First, diseases are tied to biological, chemical, and physical phenomena. Second, biomedicine privileges knowledge garnered through laboratory and clinical experimentation. Third, biomedicine commits itself to, both philosophically and methodologically, reductionism. Thus, biomedicine holds that the human being is best understood through an examination of its subsidiary parts, and, in concert, the phenomenon of human illness is primarily explained by disorder, malformation, maladaptation, and dysfunction of these constituent parts (Krieger, 2024; Valles, 2020). These features are mutually reinforcing; a naturalistic account of disease requires methodological naturalism be employed in research and, in turn, lends explanatory power to reductionism. Extending the line, the biomedical worldview generates a research paradigm that delivers a body of knowledge that furnishes the grounds for a specific type of healthcare practice.

Accordingly, the disease etiology and the grounds for cure are found in the body; anatomical structures, biochemical functions, and physiological processes contain "truths" about human disease and cure. Technology is used to examine and probe the human body so that it reveals its secrets, and biodata in the form of chemical markers and physiological thresholds are sought to ascertain the presence of disease, its status/progression, and its resolution. Biomedicine focuses on objectifying, classifying, and quantifying the human body because deviations from posited norms mark supposed disease.[3]

[3] Yet, diseases are, at least in part, socioculturally constructed. Societal expectations shape norms in terms of human behavior, traits, and appearance. Should an individual fall outside of these expected norms, they could be classified as diseased. A much-discussed example is the "disease" of idiopathic short stature. Implicit to labeling such conditions as diseases are assumptions about the normative body, and fueling cultural expectations that these conditions be termed disease states are biotechnological remedies that can be had.

Biomedicine is intrinsically linked to healthcare across the globe. The physician's work of diagnosing and treating patients is wedded to the naturalistic and reductionist understandings of the human being. Ideally, the clinician identifies diseases by obtaining biological data and examining bodily structures. Only after interrogating the body in this way should the physician proceed to select an appropriate therapeutic regimen. Moving upwards from the patient–clinician encounter, patient-level biomedical data is aggregated into population-level data stores, which are then used to determine the boundaries of normativity and allows for the sociocultural construction of disease states. Once the disease label is applied to a condition, pharmaceutical and biotechnological companies take up the cause to develop therapies.

In this essay, we explore several inter-related questions: first, is biomedicine, in line with transhumanist impulses, 'medicalizing' natural life processes such as aging into a 'disease' to be overcome? Second, does biomedical science point towards our ability to substantially prolong life and what does the Islamic scripture say of this possibility? Are these two domains of knowledge in conflict? Third, if radically pushing human longevity is scientifically possible, should we do so from an Islamic perspective?

A Case Study: Radical Life Extension

Long-held caricatures of physicians as "men against death" fuel the expectation that healthcare will continually to increase human longevity (De Kruif, 1932). Similarly, recent leaps in computing sciences and biological mimicry give hope that science and technology will rid humankind bodily dysfunction and disorder. Hence, societal aspirations of solving aging through biotechnology bring healthcare practices closer to transhumanist aspirations, among which is the enhancement of Radical Life Extension (RLE).

Australian philosopher and ethicist Margaret Somerville (1942–) describes RLE as "life extension beyond the postulated human species maximum lifespan, which is believed to be about 120 years and where the extension is brought about by human intervention" (Somerville, 2009). Sociologist Bryan Turner (1945–), on the other hand, defines RLE as "the expansion of a person's lifespan far beyond what is currently humanly possible by eradicating aging and disease" (Turner, 2009). Others distinguish between moderate and radical life extension. For instance, Campbell places moderate life extension in the realm of 100–200 years and RLE in the territory of 400 years or more (Campbell, 2020), while American sociologist Shahin Davoudpour and philosopher John Davis view moderate extension as a life expectancy of 120 years, and RLE as the

complete cessation of aging so that humans live up to 1,000 years (Davoudpour & Davis, 2022).

The pursuit of RLE results from decades of advancements in public health, medicine, and biotechnology. Indeed, public health and technology-driven measures such as food security, water purification, sanitation, vaccination, antibiotics, and cancer chemotherapy have substantially decreased mortality and increased human longevity (Vijg & De Grey, 2014). In addition, progress in the understanding of aging processes at the molecular basis of aging combined with ideological beliefs about the trajectory of human evolution have led many scientists to adopt a highly "optimistic" view of the possibility of greatly extending the human lifespan and forestalling death. This 'new' attempt to redefine human destiny is based on several philosophical assumptions.

First, humans are considered not to be designed for aging or death; their physical nature is malleable (Schuler, 2021). Therefore, becoming old and dying need not be part of human destiny. Second, aging and mortality are not "natural," but rather diseases to be overcome and transcended (Schuler, 2021). Remedying the symptoms of, and diseases resulting from, old age, therefore amounts to rectifying human deficiencies (Lombard, 2023). Third, our current understanding of health, medicine, and therapy are narrow and distorted; health should be viewed as not simply restoration to what is normal, rather, it should also aim at maximizing human potentialities through bodily enhancements; freeing humans from physical vulnerabilities reflects a more accurate meaning of health and well-being (Lombard, 2023). Fourth, pain, suffering, and bodily demise are all maladies, whereas interminable human longevity enables humans to experience joy and self-fulfillment through meaningful endeavors undisturbed by death (Lorrimar, 2018).

In pursuit of conquering and, ultimately defeating, aging, transhumanists propose two workplans. The first involves mind uploading, defined as the process of transferring one's consciousness into a non-biological entity, another biological body, or across the internet (Doorani, 2023). Here, the aim is to keep one's mind indefinitely operative after the demise of the body, thereby liberating one from bodily confinement (Gaitán, 2019). The second is the extension of embodied human life through measures that attenuate aging. These measures include caloric restriction, genetic manipulation, stem cell therapy, and other pharmacological interventions[4] (Fontana et al., 2010; Verdaguer et al.,

[4] Note the difference between anti-aging strategies to achieve RLE and anti-aging strategies in the field of geriatrics or elderly health. While the modalities may overlap, the former's goal is to radically extend the human lifespan and eventually avoid death, while the latter's aim is primarily to avoid aging-related diseases and maximize one's health in old age.

2012). In this essay, we will focus on the latter (extension of embodied human lives) and not the former (mind uploading), because mind uploading is highly speculative (Warby, 2021), and its goal is to achieve (digital) immortality, which is beyond the remit of RLE.

The science behind anti-aging efforts

Calorie Restriction (CR) is defined as the "reduction of dietary intake below energy requirements while maintaining optimal nutrition" (Flanagan et al., 2020). CR reduces metabolic rates and oxidative damage, improves markers of age-related diseases, and promotes stem cell self-renewal and tissue regeneration (Green et al., 2022). Even though CR experimentation has been largely conducted using animal models, studies involving human subjects corroborate its role in enhancing longevity. These include the Okinawa Island study in Japan that shows associations between lower caloric consumption and a healthier and longer lifespan (Most et al., 2017), and the Comprehensive Assessment of Long-term Effects of Reducing Intake of Energy (CALERIE) study in America that demonstrates a positive impact of CR on aging biomarkers (Dorling et al., 2021).

On the other hand, drugs can mimic the effects of CR. Known as "CR mimetics", these pharmacologic interventions target the metabolic pathways CR affects without requiring actual calorie reduction (Ingram et al., 2006). Anti-aging pharmacological drugs can be classified into four groups according to their target/level of interventions: 1) senolytics, 2) rapalogs, 3) metabolic, and 4) anti-diabetic drugs (Petr et al., 2024). The third anti-aging strategy, gene therapy, alters a person's genes. There are three main categories of gene therapy: gene replacement, gene editing, and epigenetic modification (Yu et al., 2023). Gene replacement refers to the substitution of a faulty gene with a healthy or engineered one (Pandey & Balekar, 2018), while gene editing involves techniques that alter specific DNA sequences by inserting a healthy/modified sequence and replacing the pathological one (Scanlon, 2020). Epigenetic modification modifies the expression of genetic information through inhibiting or activating the expression of certain genes and adjusting imbalances in gene expression (Li et al., 2020; Li, 2021). The fourth modality, stem cell (SC)[5] therapy, is a type of regenerative medicine that utilizes the unique properties of viable human stem cells, such as self-renewal and differentiation, to replenish and replace damaged cells and tissues with new cells (Biehl & Russell, 2009). SC therapy can be self-to-self (autologous), in which patients' own cells are

[5] Stem cells are cells that have the capacity to self-renew and differentiate into more specialized types of cells and tissues. Sources of stem cells include embryonic stem cells, adults stem cells, induced pluripotent stem cells (which are adult stem cells that have been altered to act like embryonic stem cells), and perinatal stem cells.

used, or they can be derived from a healthy donor (allogeneic). Potential applications of SC therapy have been demonstrated in aging-related diseases such as Parkinson's, Huntington's, and stroke (Nguyen et al., 2019) and aging-related defects such wrinkles and skin thickness through the use of adipose-derived mesenchymal stem cells (ADMSC) (Mazini et al., 2020).

Limitations of the science

Even though research evidence that supports the possibility of life extension is increasing, it has several drawbacks. First, despite some positive findings, studies predominantly use animal models rather than human subjects. As a result, it is unknown whether the interventions would be effective among humans. For instance, a meta-analysis by Liang et al. that investigated survival records from studies reported that CR and CR mimetics were superior to other types of anti-aging interventions (Liang et al., 2018). Yet, all the studies analyzed used animal models, such as Drosophila (a type of fruit fly) and Caenorhabditis elegans (a type of nematode) (Liang et al., 2018). Likewise, the pro-longevity effects of anti-diabetic drugs (metformin and acarbose) and rapalogs (rapamycin), and the anti-aging effects of SC therapy (e.g., mesenchymal SC transplantation) on cognitive function have been demonstrated in animal models (Garay, 2021; Shetty et al., 2018). Second is the question of safety, adverse effects, and the efficacy of the interventions used in anti-aging research. Illustratively most studies are in the clinical trial phase(s),[6] with very few agents receiving approval for routine use by the Food and Drug Administration (FDA). Indeed, a recent review of stem cell therapy-based studies to slow or reverse aging conducted in the United States, Europe, China, Japan, found that the majority were Phase I/II clinical trials (Garay, 2021), denoting that the safety and true efficacy of SC therapies has yet to be ascertained (NIH, 2022). Similarly, gene therapy has been associated with the genotoxic potential of viral vectors that can upregulate proto-oncogenes, predisposing subjects to cancer (David & Doherty, 2017). Whether this risk exists with anti-aging genetic interventions remains unknown.

[6] Clinical trials are research that involve people and test new ways to prevent, detect, diagnose, or treat diseases. There are usually four phases: 1) in Phase I, researchers test a drug or treatment in a small group of people (20–80) for the first time—the aim is to study drug safety and identify side effects; 2) in Phase II, the new drug or treatment is given to a larger group of people (100–300) to determine its effectiveness and to further study its safety; 3) in Phase III, the drug is tested among large groups of people (1,000–3,000) to confirm its effectiveness, monitor side effects, and compare it with standard treatments; 4) in Phase IV, once a drug is approved by the FDA and made available to the public, researchers track its safety in the general population, seeking more information about the treatment benefits and optimal use (see source: NIH 2022).

Considering these limitations, we argue that research on longevity and life extension is at a rudimentary stage (Fukuda et al., 2023). Substantiation of its evidence on efficacy is limited by factors such as inadequate human subjects, safety concerns and adverse effects, and scarcity of late-stage clinical trials. Thus, as it stands, whether human beings can achieve RLE or extreme longevity soon is a question to which the science is ambiguous.

Islamic perspectives on aging, longevity, and death

To fully capture the Islamic perspective on aging, longevity, and death, one needs to know how Islam views the human life course. In his book *The Lives of Man*, the well-known North African Islamic theologian Abdullah ibn ʿAlawi al-Haddad (d. 1720) described the five stages of human existence (al-Haddad, 1991). The first stage is life before conception. This began with the creation of the Prophet Adam, after which all his progenitors (in their essential form, as souls) were brought forward before God to take the covenant recognizing His Unity and Lordship (Q.7:172). The second stage is life in this world, which involves the soul being merged with a body to create an ensouled being. It begins with human conception and birth and ends with death (defined as a separation of the human soul from the human body). It is in this life that humans are tested and given the opportunity to merit-make for the afterlife. This stage has several substages including childhood, youth, maturity, and old age. The third stage is the intermediary life (*barzakh*); a phase that begins upon death and continues until the Day of Resurrection. The fourth stage is life on the Day of Judgment, where humankind will stand before God to give an account of their lives in this world. In the last stage—also known as life of the eternal abode—every human being either enters heaven or hell (al-Haddad, 1991; Sulaiman, 2020).

Critically, the life of this world is only a small portion of the full spectrum of human existence. The endeavor to extend life, as espoused by transhumanists or RLE advocates, is fully concentrated in this stage. As transhumanists generally refute a metaphysical reality, it only makes sense that they focus on maximizing this portion. From an Islamic perspective, there are two ways of understanding this phenomenon. First, given its brevity, this 'worldly life' is only important in so far as it serves as an instrument to better one's afterlife. Said another way, the principal role of this brief portion of one's existence is to gather virtuous deeds and prove their worth in the sight of God, with the hope that doing so improves one station in the afterlife. Thus, some Muslims may contend that living longer is praiseworthy, for it gives humans more time and opportunities to do good and make amends for their misdeeds. Second, and in contrast to the former view, Muslims tend to be reticent about seeking longevity because life on earth is described as illusion and deception in the Qur'an (Q.57:20).

Thus, one's goal is to exit the illusion with their goodness intact as quick as possible. Indeed, a Prophetic supplication reads "O Allah, keep me alive so long as life is good for me, and bring me death if death has good for me."[7] As such, it is not life or death – or the duration spent in this world – that really matters, but the virtuous pursuits conducted within it. Longevity, as well as death, are indexed to the end they allow for. The hadith's repetition of the word *khayr* – generally translated as goodness – indicates Islam's emphasis on the end goal of life and death. Death could portend a goodly end as it curtails ones capacity for sin.

Islamic teachings consider aging as a natural part of the human life cycle. Aging reminds humans of, and is a path toward, death and the next life. Scriptural sources attribute meaning to the aging process at different levels. The first level pertains to the physical or biological nature of aging; becoming old is depicted as a natural process characterized by a gradual decline in physical and mental strength (Q.19:4; Q.30:54). The second level is social or relational, where notions of aging are tied to relationships between the older persons and surrounding people, and responsibilities of community members for their care and welfare. For instance, the Qurʾan emphasizes a child's duty toward his/her old parents, highlighting that caring and honoring them comes second after worshiping God (Q.17:23). Similarly, several *ḥadīth* expound the divine command of treating older people with respect, underscoring collective obligations to care for elderly members in society. The third level involves the spiritual domain. Old people are portrayed as having a special rank before God, thus cherishing and extending support to them is a means to attain God's pleasure. Examples are *ḥadīth,* which illustrates how God's mercy, forgiveness, and leniency increase for His servants as they age and highlight kind treatment and respect for the elderly as a means to obtain divine reward and be accepted into the community of believers.[8]

Abu Ali Al-Hussein Ibn Abdullah Ibn Sina (d. 1037), the most influential physician and philosopher-scientist of the medieval Islamic world, classified the human life into four periods: the period of growth (childhood-adolescence), the prime of life (period of beauty), elderly life (period of decline), and decrepit age (senility) (Gruner, 1973). In his 'Canon of Medicine', Ibn Sina presents the goal of health as maintaining or restoring health (when it is lost), and guiding the human body towards attaining a natural life span, and thus, a natural death. Death, on the other

[7] Sahih Muslim 2680a, Book 28, Hadith 10. Available at: https://sunnah.com/muslim:2680a

[8] Anas bin Malik reported: Messenger of Allah (pbuh) said, "*If a young man honours an older person on account of his age, Allah appoints someone to show reverence to him in his old age*." (Riyad as-Salihin no. 359).

Narrated by Abdullah ibn Amr ibn al-ʿAs: The Prophet (pbuh) said: "*Those who do not show mercy to our young ones and do not realise the right of our elders are not from us*" (Sunan Abi Dawud no. 4943).

hand, is described as an inevitable life event, with every person's lifetime largely dependent on the intrinsic heat-moisture balance in the body (Nimrouzi et al., 2017). Therefore, like many early Muslim physician-scientists, his focus was not on substantial life prolongation, rather he exerted his energies to discover regimens that prevent illnesses and states of imbalance that can cause premature deaths, and promote healthy lifestyles pertaining to diet, sleep, physical activities and stress management (Siahpoosh et al., 2023).

Juxtaposing scriptural with scientific evidence on extreme longevity

The Qurʾan does not specify the human lifespan but stresses in multiple verses that this is a matter of the unseen, ultimately residing within God's provenance (Q.21:35) (Musa, 2009). It states that God blesses some humans with long lives and decrees early deaths for others out of His wisdom and as a reflection of His power (Q.7:34; Q.10:49; Q.16:61; Q.35:45). Accordingly, it is difficult to pinpoint specific verses that explicitly spell out the prospect of extreme longevity or inspire humankind to pursue it in the general sense. It is not far-fetched to think of the overall Qurʾanic outlook on a prolonged lifespan with indifference. This apparent lack of importance attached to extreme longevity – as opposed to the enthusiasm for anti-aging research in modern science – should not be viewed in a pejorative sense. It is not because Islam does not value life, rather, the Qur'anic message reflects an attempt to redirect the human focus from quantity (number of years lived) to quality (good action in lifetime) (Q.101:6–9).

Nonetheless, the Qurʾan does not negate the possibility of humans having the capacity to survive extraordinarily long years. Several accounts confirm its occurrence. The story of Prophet Nūh is the most frequently cited example of extreme longevity. The Qurʾan (Q.29:14) explicitly mentions he lived "*a thousand years bar fifty*" among his people. Scholars of the Qurʾan have various opinions on Prophet Nūh's total lifespan; some state that he lived for 950 years in total, while others suggest that he might have lived between 1,020 and 1,700 years (IslamQA, 2013). A second account is the story of the People of the Cave who fled into a cave to escape persecution while maintaining their faith in God. While this event can be regarded as a miracle, the verses clearly indicate that the men survived for an extended duration—approximately three centuries according to some scholars (Fudge, 2007).

Several *aḥādīth* are quoted in discussions on aging and the human lifespan. Herein we focus on two well-known ones. In the first, Abū Hurayra reports that the Prophet Muhammad described the lifespan of his

ummah to be between 60 and 70 years,[9] with a small number exceeding that range. In the second, the Prophet is reported to have said that God does not create a disease without providing a remedy, except for one which is old age.[10] Al-Tirmidhī (d. 892), the renowned Islamic scholar *ḥadīth* specialist from Uzbekistan, grades the former *ḥadīth* as *ḥasan* and the latter as *ṣaḥīḥ*.[11] At first sight, the two *ḥadīth* seem to suggest that the human life expectancy is somewhat static or fixed, nullifying the possibility of "treating" or defying the aging process. One might then wonder: Does this mean life extension beyond its current threshold is impossible? Does this not contradict scientific evidence of anti-aging biomedical interventions that seem promising? What about those Qurʾanic accounts?

First, while the two Qurʾanic narrations are definitive evidence, i.e. certain in both transmission and semantic import, to confirm the occurrences of extreme longevity, the narratives do not definitively indicate that human beings are naturally endowed with capacity for such lifespans. Prophet Nūh's lifespan of 950 years is said to be a special divine favor (see Sedick 2023).[12] Similarly, the story of *Ashāb al-kahf* is an obvious miracle and divine intervention that was bestowed on account of the youths' fealty to God. Furthermore, these occurrences predate the Prophet Muhammad and as such these people may not be included in the term *ummah* in the *ḥadīth* (more on this term below).

The first *ḥadīth* that specifies a range "between 60 and 70" can be deemed problematic as published data show that the global average life expectancy has surpassed 70 since 2011, currently stands at 73.3, and is expected to hit 77 by 2050 (Macrotrends, n.d.). In other words, its trend has been upward for the last several decades and may increase in the future. However, we maintain that these statistics cannot negate the *ḥadīth* content.

[9] Abū Hurayra narrated that the Messenger of Allah (*s.a.w.*) said: "The lifespan for my Ummah is from sixty years to seventy [years]" (Jamiʿ at-Tirmidhī no. 2331). In another narration, it was reported slightly differently: The lifespan for my Ummah is from 60 years to 70 years and very few surpass this (Sunan Ibn Majah no. 4236).

[10] Usamah bin Sharik said: Some Bedouins asked: "O Messenger of Allah (pbuh) shall we treat (our ill)?" He said: "Yes, O worshipers of Allah! Use remedies. For indeed Allah did not make a disease but He made a cure for it" —or— "a remedy. Except for one disease." They said: "O Messenger of Allah (pbuh)! What is it?" He said: "Old age." (Jamiʿ at-Tirmidhī no. 2038).

[11] A *sahīh hadīth* is a *hadīth* that has a connected chain of transmission, each narrator being upright in character, exacting, and reliable in his narration and transmission. A *hasan hadīth* is a *hadīth* which has a connected chain of transmission, by narrators who are upright and exacting, but whose exactness is less than the exactness found in a *sahīh hadīth*, and which is free from irregularities or serious flaws. Available at: https://islamqa.org/shafii/seekersguidance-shafii/169108/what-is-the-difference-between-a-sahih-hassan-and-daif-hadith/

[12] For the explanation on the different types of miracles in Islam (*muʾjizah* and *karāmah*), see IslamQ&A (2012).

We begin by performing a brief intratextual analysis[13] of the term *umr*. In the Qur'an, *umr* – or more specifically its triliteral root – appears 24 times in 10 derived forms, and the meaning ranges from 'to build/maintain', 'to grant life or to be granted life', 'to settle' and 'to perform *umrah*' to 'an aged person', 'age', 'life' and 'lifetime.' If we focus only on *umr* that appear as nouns, there are 11 occurrences from which 8 convey notions of age, life and lifetime (Corpus, 2017). Consequently, in its simplest form, *umr* is understood as an individual's age or the duration or his/her lifespan.[14] This is not difficult to understand. However, challenges appear when *umr* is compounded by *ummah*, which is a collective term, thus rendering the interpretation of *umr* more technical and complicated. Determining the *umr* of a person is not the same as determining the *umr* of a population. The latter needs a more complex calculation, but first, the definition has to be clear and comparable to that of modern terms used in the relevant field. Does *umr* refer to the human lifespan or to average life expectancy? Or does it denote the modal age at death? Note that these demographic terminologies have a different meaning and may reflect a distinct concept. While people tend to use lifespan and life expectancy interchangeably, they are actually not similar. Lifespan is the maximum length of time a species can be expected to survive, regardless of the number of members who achieved that age. Meanwhile, life expectancy refers to the average number of years a person can expect to live (Parker & Achaval, 2017); an estimate of the mean age of population members when they die. Conversely, modal age at death means the age at which most deaths occur in a population (Canudas-Romo, 2010).

What follows is our reasoning of why the *ḥadīth* content cannot be refuted based on the conceptualization of these demographic terminologies. Importantly, these longevity measures are not exhaustive; we select three commonly used modern metrics to demonstrate how they are not comparable to the term *umr*, and thus cannot be used to affirm or negate the Prophetic saying:

1. *Umr* as lifespan

The term lifespan in modern demography means the maximum age that can be achieved by any member of a given species (Parker & Achaval, 2017). Currently, the human lifespan stands at 122 (Robine et al., 2019). The

[13] Intratextual analysis is a method of studying Qur'anic terminologies by examining and comparing their occurrences in other verses and sections within the Qur'an. On the other hand, interterextual analysis compares the Qur'an's content with other existing texts, such as Abrahamic religious texts or literary genres. Here, we limit our assessment to intratextual analysis of *'umr* as this is most relevant and to avoid lengthy discussions beyond the article scope.

[14] The term *umr* is defined in the Reverso Arabic-English disctionary as age, life, lifetime, longevity, and lifespan: https://context.reverso.net/translation/arabic-english

age mentioned in the *ḥadīth* is a range and not a single value. Moreover, a maximum lifespan can be established even by one or a few members reaching an extreme age, while the *ḥadīth* clearly refers to a collective phenomenon.

2. *Umr* as average life expectancy

Typically, the term average life expectancy refers to the average life expectancy at birth (LEB). As mentioned earlier, the global LEB has passed 70 since 2011, while the *ḥadīth* clearly gives an upper range of 70. A closer examination shows that comparing LEB to *umr* is problematic because LEB is a mean value[15] and it is highly influenced by infant and child mortality rates (Ortiz-Ospina, 2017). As such, LEB is less practical when the goal is to understand longevity of older adults (Parker & Achaval, 2017). In fact, compared to the other two longevity measures—median and modal ages at death—LEB is the only measure that "changes regardless of the age at which the reduction in mortality occurs" (Canudas-Romo, 2010). In other words, LEBs values do not accurately reflect longevity in old age given that its calculation depends on other factors, mainly infancy mortality rates.

3. *Umr* as modal age at death

Given the drawback of LEB that employs a mean value, some demographers maintain that the modal age at death is a more useful measure to reflect longevity of older adults. But here the main obstacle is the lack of data of this measure in many regions. Today, most countries maintain records and trends of LEB but not of modal age at death. In fact, nations that systematically document their modal age at death are few, mainly comprising high-income Western countries (Canudas-Romo, 2010). Therefore, there is insufficient evidence to prove or disprove the *hadīth* based on the modal age of death.

In a similar vein, the word *ummah* is not uniformly defined. Even though the *ḥadīth* text is explicit about the *ummah* being attributed to Prophet Muhammad, the next question would be: Does this refer only to Muslims who believe in his message? Or does this include the global community from his time to this day? An intratextual analysis of the term *ummah* reveals that the term appears 64 times in the Qur'an, with the plural form (*umam*) found in 13 cases. Of 64 occurrences, 53 were revealed in Makkah and the remaining 11 in Medina (Al-Ahsan, 1986). While Makkan verses use the word *ummah* somewhat synonymously with *qawm, milla, dīn, tarīqa, jamā'a* and *sha'b* in a rather loose sense, Medinan verses largely imply that *ummah* was more specific to the newly emerging Muslim

[15] A major disadvantage of mean is that it is sensitive to extreme values/outliers, and it is not an appropriate measure of central tendency if the data distribution is skewed.

community around the Prophet (Ahmed, 1975). Relatedly, the Qur'anic usages of the expressions *ummatan wāhidah* (Q.21:92), *ummatan wasata* (Q.2:143) and *ummatan muslima* (Q.2:128) clearly bring out the origin, ideological orientation and character of the community based on Islamic monotheism (Ahmed, 1975). Nevertheless, when analyzed in relation to the socio-historical specificities of the Prophet's life, we find that the term *ummah* was also used in the Aqabah treaty to refer to the Jewish community living in Medina; but scholars argued this was different and employed in a "general sense of a confederal community or a defensive alliance system"(Ahmed, 1975). As such, some commentators have underscored the potential inclusivity of this term,[16] which can be extended to non-Muslims (Mohammed & Jureidini, 2022).

However, considering the wider consensus on the meaning of *ummah* and the Prophet's usage of a possessive pronoun ("my *ummah*") in the *hadīth* text, we contend here that: a) *ummah* most likely alludes to the community of believers (Muslims) or those who are committed to the message of Islam (Al-Ahsan, 1986); b) *ummah* is a trans-territorial and trans-temporal construct based on ideological unity; therefore it is not confined to believers during the Prophet's lifetime. Next, we highlight how this term—regardless of how it is defined—cannot be used to affirm or negate the content of the second *ḥadīth*. Let's see the two scenarios below:

1. *Ummah* as the community of believers (Muslims)

If we take this definition, the existing life expectancy statistics are difficult to apply because most published data are global or country-based and do not differentiate people based on religious beliefs. There is almost no way to know the actual lifespan of life expectancy of Muslims exclusively. Perhaps the closest is to look at the vital statistics of Muslim-majority nations; again, this is not accurate because it is not entirely specific to Muslims. Interestingly, the Pew Research Center found that the LEB in Muslim-majority countries was approximately 68 between 2010 and 2015, and subsequently rose to 71 between 2020 and 2025 (Center, 2011). It also reported wide variations between low-income and high-income Muslim nations (Razzak et al., 2011). As such, we maintain that the range between "60 and 70" in the *ḥadīth* text cannot be proven false because there is no evidence from contemporary demographic data to show this is true for Muslim populations.

2. *Ummah* as the global community

[16] Some scholars who claim that *ummah* includes non-Muslims often (historically) refer to the People of the Book (Christians and Jews), especially those who lived in peace with Muslims as a community. I acknowledge that details on how this term applies, or does not apply, to the modern nation-states is a more complex issue and unfortunately is beyond the scope of this chapter.

If we regard *ummah* as the global community (not just Muslims), the next hurdle is to determine to what extent existing data/statistics reflect those in the past. The *ummah* of Prophet Muhammad is not restricted to contemporary modern society, rather it began with the advent of Islam in 610 ce and will continue beyond our generation today.[17] Conversely, systematic civil registration and collection of vital statistics are a relatively modern affair. For instance, the first country reported to implement a national civil registry was France in 1539 (Encyclopedia, 2022). In Northern Europe, the parish register began in 1608 in Sweden, later followed by Finland and Denmark. The USA developed its first standard for registration of vital events, including births and deaths, in 1900 (Statistics, 2009). Thus, one cannot discredit the *ḥadīth* content because the lack of organized and systematic data collection before the modern civil registry limits our knowledge of how long the *ummah* in the past had lived.

Now we turn to the second *ḥadīth* which states that God provides a cure for every disease except for old age. If we accept its literal meaning, it would appear as if old age or the aging process is not a condition that can be remedied. Hence, how does one make sense of the increasing scientific evidence today that demonstrates the possibility of aging being slowed down or delayed? True that the evidence is not conclusive, but does this *ḥadīth* mean that we should not strive toward prolonging lives or invest in anti-aging studies and technologies because the scripture clearly says there is "no cure to old age"?

Expounding on this *ḥadīth*, some scholars maintain that the word "*al haram*"—which is literally understood as old age, or the feebleness and frailty resulting from aging—was used metaphorically to refer to death.[18] In his famous book *Fatḥ al-Bārī*, Ibn Ḥajar al-ʿAsqalānī (d. 1449), a renowned Egyptian classic Islamic scholar, wrote that *al-haram* in this *ḥadīth* was symbolic of death and was used to signify death (*shabīhan bil maut*)[19]. Likewise, al-Zarqānī (d. 1710), another Islamic scholar from Egypt, in his book *Sharḥ al-Zarqānī ʿala Muwaṭṭaʾ al-Imām Mālik* likened the term *al-haram* to death; he highlighted another instance in which the Prophet narrated something similar but used a different term, "*al-sām*," which was then defined as death (al-Zarqani, 1990). Commenting on the association between *al-haram* (old age) and disease, al-Khaṭṭābī (d. 998) claimed that the term *al-haram* does not signify disease in the typical sense; rather, *al-haram* was likened to a disease, because with aging comes a gradual and

[17] Muslims believe that Prophet Muhammad is the final messenger of God and there is no prophet after him. This means his *ummah* continues until the end of time.

[18] This explanation was given in a *ḥadīth* website maintained by the Aldorar Alsaniyyah Foundation in Saudi Arabia, under the supervision of Shaykh Alawi bin Abdul Qadir Al-Saqqaf (see Hadith Encyclopedia n.d.).

[19] This explanation was provided in a hadith/fatwa website and available at: https://www.islamweb.net/ar/fatwa/355309

irreversible deterioration and damage to bodily functions—this condition is similar to a progressive disease that leads to death.[20]

Is there any contradiction between this *ḥadīth* and scientific findings from the longevity and life extension research? We say no, for the following reasons: First, if the term *al-haram* is symbolic of death, as opined by many classical Islamic scholars described earlier, the *ḥadīth* is precise; death is a certainty in Islam (Q.3:185), a universal phenomenon, and an indisputable scientific fact. To this day, there is no cure to death, despite all the sophisticated biomedical technologies we have acquired. Second, if *al-haram* denotes a state of irreversible weakness and frailty due to old age (as indicated by al-Khaṭṭābī), the *ḥadīth* is still accurate. This is because anti-aging measures today are predominantly focused on prevention; their aim is to preserve health and delay age-related diseases and symptoms instead of treating illnesses after they start (Tenchov et al., 2024). In other words, anti-aging therapies are meant for those in relatively good health to prolong their vitality and youthfulness. They are less applicable to older adults who are already inflicted with severe age-related diseases and symptoms of decline—a state similar to *al-haram*.

Based on the empirical and Islamic scriptural evidence presented, we contend the possibility of humanity radically extending its lifespan cannot be affirmed or negated. The scriptural evidence does not contradict contemporary bioscientific findings on anti-aging research nor demographic data on life expectancies. Therefore, RLE could be part of our future.

The Moral Bounds of Medical Practice: Should We Pursue RLE?

Conceptions of Therapy, Enhancement, and Alteration in Contemporary Bioethics

With RLE being an open possibility, we now turn to the question of whether we ought to seek this end through the profession of medicine. Recognizing the linkage between the philosophical and epistemic commitments of medicine and transhumanism, namely a naturalistic and reductionistic account of the human being as well as health and disease, numerous bioethicists have warned against healthcare embracing transhumanism (Jones, 2016; Porter, 2017). In varied ways, these scholars seek to define the practices of medicine proper as related to restoring lost abilities and functions, facilitating equality of opportunity, and acknowledging human finitude. Transhumanism, on the other hand, is seen as desiring the impossible, e.g., immortality, creating abominations, e.g., cyborg life, and betrays hubris concerning the capacities of science and

[20] This explanation was provided in the same hadith/fatwa website as above at: https://www.islamweb.net/ar/fatwa/355309

technology. Accordingly, scholars use the concepts of therapy and enhancement to draw a border between practices that fall within the purview of medicine and those that do not. The distinction is explicated in at least three ways, each giving primacy to a different stakeholder in drawing the line.

The first approach puts the onus on policymakers and licensing bodies, assumed to gain their authority from the polity, to demarcate therapy from enhancement. This view, termed the professional domain approach, holds that any practice that a physician engages in, or in other words, any good or service that a clinician provides, is therapeutic. Thus, activities that occur outside of a patient-clinician professional relationship may be considered an enhancement. For example, the prescription of testosterone within the confines of a patient–doctor relationship is therapeutic. In contrast, taking testosterone on the advice of an athletic trainer may be considered an enhancement. This view coheres with the idea that medical practice is based on a social contract and that patients' values regarding what is done to their bodies outline the parameters for the social structuring of healthcare delivery (Juengst, 2004).

The second approach entails the construction of normativity. Proponents argue that healthcare, at its core, is a means to equality of opportunity for society's members. Hence, medicine's role is to assist individuals in overcoming their inherent biological and psychological, and at times social, curtailments that frustrate achievement. Accordingly, restoring or improving the patient's abilities to an "equality of opportunity" threshold is medicine's mandate and judged to be therapeutic; moving beyond that reference to create an advantage is considered enhancement. Defining norms becomes a crucial moral activity. Tying normativity to equality of opportunity introduces society-specific elements to the definition of treatment, for what therapy is in one social context might be considered enhancement in another. Alternatively, one could ground normativity in biological or psychological function. This would require identifying species-specific capacities, developing measurement tools, and then mapping data onto a bell curve-type distribution to set up thresholds for what is classified as treatment or enhancement.

In a third approach, termed the disease-based approach, the state of the human being acted upon distinguishes treatment and enhancement. Treatments target individuals experiencing a health problem tied to a disease, disability, dysfunction, or disorder. On the other hand, enhancement activities are applied to an individual with normal traits and functioning. This approach is based on the idea that maladies are empirically verifiable and, hence, the appropriate targets for treatment.

Yet, this view inherits the same normativity challenge as the previous one. It also places the authority to define and responsibility to police the boundary between therapy and enhancement squarely within the profession of medicine.

Differentiating therapy from enhancement is viewed as critical to the defense against transhumanistic ideals instrumentalizing healthcare. Yet, the dividing line is fuzzy. Fabrice Jotterand, a philosopher-ethicist, attempts to address ambiguities by adding a third category, alteration. Driven by the concern that therapy and enhancement do not accurately portray the radical transformation envisaged by transhumanism, he notes that "the goal [of transhumanism] is to transcend biological boundaries through technological means to alter human capacities" (Jotterand, 2008)He redefines therapy and enhancement to accommodate a third category of alteration and sharpen the distinctions between each category. Therapy primarily entails restoring capacities lost due to disease but may include modifications that raise individuals with inborn diminished capacities to a posited biological norm. Enhancement involves activities that augment an individual's biological capacities beyond species-typical norms. Alteration, on the other hand, traverses biological limits such that the resulting state is no longer considered human.

Harkening back to RLE, an example of therapy would be to provide medications or interventions that target age-related disease and dysfunction such as arthritis or dementia. The result of such targeted treatment may be a modest lifespan increase as morbidity is reduced. Conversely, targeting the aging process specifically – to slow or arrest it – with the intent of extending human lifespan falls within the category of enhancement. This assessment, however, becomes complicated if one chooses to define therapy as that which occurs within the confines of a patient-clinician relationship. Indeed, some clinicians are directly involved in longevity research or may hold that it is proper to prescribe anti-aging and/or life-extension modalities to their patients. Yet, a valid counterargument derives from the inequalities RLE may produce. Radically prolonging human lives will widen the gap between societies in high-income regions most likely to benefit from RLE technologies and those in lower-income regions often deprived of access to basic health care (Kass, 2004). Additionally, RLE has been predicted to aggravate existing economic scarcities, social inequalities, and environmental degradation, ultimately leading to intergenerational conflicts (Dumas & Turner, 2007; Partridge et al., 2009). Thus, RLE would be considered to be an enhancing and not a therapeutic use of biotechnology based on this schema as well. The third approach would also deem RLE to be an enhancement because RLE activities target the normal human being as opposed to an individual with curtailed capacities or abilities. Lastly, depending on the modalities

utilized for reversing aging or immortalizing human beings one could argue that we have traversed enhancement and moved into the alteration category as the 'humanness' of the resulting being comes into question.

An Islamic Bioethical Perspective on the Bounds of Medical Practice and RLE

Islamic bioethics is an evolving multidisciplinary discourse that uses the Islamic tradition to address moral questions and ethical issues related to biomedicine and healthcare. At the center of this discourse is a discursive pairing: an individual (or institution) from the biomedical arena that seeks religious guidance and resources, and an expert respondent (or group) representing the Islamic tradition. This pair is commonly a Muslim physician and an Islamic jurist, and *fatāwā* are important source material for the field (Padela & Moosa, 2021). Religious authority in these discussions is naturalized within the personage of Islamic jurists because Islamic law is considered the preeminent moral science within the religious tradition, and questions of what can be done often precede what ought to be done. Surrounding this dyad are other scholars (biomedical scientists, policy experts, and social scientists, among others) who, ideally, provide information that clarifies the issues at hand and thereby complements the interaction.

The dominance of Islamic law notwithstanding, in our view, Islamic bioethical deliberation should map onto act, agent, and end goal-based morality by drawing upon the sciences of (i) law, (ii) virtue and practical ethics, and (iii) theology, respectively (Padela, 2022; Padela & Moosa, 2021; Sartell & Padela, 2015). Islamic law, *fiqh*, principally focuses on assessing the morality of an act. Yet, Islamic moral theology (Fadel, 2008), *uṣūl al-fiqh*, is the hermeneutical science for deriving law from scripture and relates to act-based morality, and it furnishes tools for explicating theological understandings of illness, cures, health, and other concepts related to biomedicine. This latter aspect is complementary to the science of *kalām*, scholastic theology, where metaphysical and ontological frameworks help explicate such concepts. The *maqāṣid*, together with *uṣūl* and *kalām*, attend to outcome-based morality.[21] On the other hand, various Islamic sciences of moral formation and literary genres cultivating virtue and practical

[21] The *maqāṣid* refer to the higher objectives of Islamic law and are considered to be the core human interests that the law protects. The theory of *maqāṣid* is grounded in notions of general human interest/welfare, *maṣlaḥa*, which is an ethico-legal construct, but also can be a source, for Islamic law. There is considerable debate regarding the scope of *maqāṣid,* their usage to ground new rulings, and their usage in Islamic medical ethics deliberation. Here, I am simply suggesting that *maqāṣid* frameworks could service outcome-based morality. For a fuller discussion of the promise and perils of using *maqāṣid* frameworks to engage modern biomedicine see Padela, Aasim I. 2025. *Maqasid Al-Shariah and Biomedicine: Bridging Moral, Ethical, and Policy Discourses*. International Institute of Islamic Thought (IIIT),Herndon, VA .

ethics, including *'ilm al-ahklāq, taṣawwuf*, and *adab*, attend to the reformation of one's inner being, molding one to incline toward righteous action. *Adab* manuals specific to various professions go further in connecting the inner and the outer by motivating one to live out virtues in their vocational practice. While *adab* can be wedded to scriptural understanding of the virtues, the genre also incorporates practice-based virtues that are not scripturally based. These are gleaned from exemplars within the profession since the internal goods of the profession are best known to and demonstrated by those in the practice.

Together, then, broadly speaking, law, theology, and the sciences of virtue and practical ethics offer a complete assessment of the moral dimensions of biomedicine as they attend to the morality of the act, the goals to be achieved and actualized, and the agent. Indeed, a comprehensive ethics framework must be constructed to assess and evaluate this confluence. With that introduction out of the way, what is an Islamic perspective on the moral parameters of medical practice as related to RLE?

In applying an *adab* perspective to this question, assessing what exemplar Muslim physicians considered to be the goals of medicine is informative. Classical Muslim theorists see physicians' practices as restoring patients' health, fixing that which has been lost due to injury, and preventing illness. As stated earlier, Ibn Sina describes that medicine's purpose as "is to preserve health when well and restore health when ill." (Aligabi, 2020). Abu al-Faraj Ali ibn al-Husayn ibn Hindu (d. 1032), Ibn Sina's contemporary, concurs that "medicine is a profession that deals with human bodies and brings them good health" (Tibi & Savage-Smith, 2010). Explicating the phrase 'brings them good health,' he notes that this phrase refers to preserving health when present and restoring it if absent thus matching Ibn Sina's view of the goals of medicine. Another classical Muslim physician, ibn al-Nafis, elaborates further, "A physician is not obligated to maintain one's youth and vitality (bodily strength), nor is he obligated to make every person reach their longest possible lifespan, let alone prevent death (Ibn Abī al-Ḥazm & al-Nafis, 2008). Hence, at least historically, RLE, was not an explicit aim of the profession and its Muslim exemplars.

Moving to the legal aspect of Islamic bioethics, radical life extension and transhumanistic interventions, are not much discussed within extant *fatāwā.* This is understandable given that jurists are responding to questioners embedded within present contexts, while transhumanism and RLE, is more science fiction/future than contemporary reality. However, the responsa literature offers some insight into Islamic norms that weigh upon such interventions. In accordance with the sketch of Islamic bioethics

deliberation noted above, juridical academies that bring together multiple physicians, jurists, and other scientists are often considered to be the best sources of Islamic bioethics 'rulings.' These collective resolutions are thought to avoid bias and blindspots that single jurists may have.

Accordingly, contemporary Islamic juridical councils circumscribe the extent to which Muslim physicians (and patients) should modify the human body. They hold that physicians must treat diseases that can be objectively assessed, and therapy entails correcting a physical or physiological defect, whether acquired or inborn. These views align with classical Muslim physician's noted above. According to jurists, moving beyond these thresholds to augment capacities features contravenes scriptural commandments that prohibit changing creation.

Illustratively, in *fatāwā* related to genetic engineering and body modification (all techniques that could be utilized for transhumanist goals), jurists oft-cite a Quranic verse in which Satan promises to command humankind to "change the creation of God (*taghyīr bi-khalq Allāh*)" (Q.4:119), to draw a red line by prohibiting body modifications that significantly alter the human body and/or impact human nature. For example, in 1998, the Islamic Fiqh Academy of the Muslim World League (IFA-MWL) prohibited "interfering with genes to improve the human race"(Al-Bar et al., 2015). The Islamic Fiqh Academy of the Organization of Islamic Cooperation (IFA-OIC) concurred in their 2013 resolution noting that such usage would contravene the prohibition of changing God's creation, violates human dignity, and does not meet the threshold of dire need or necessity to justify its use. (Shabana, 2022). Similar constraints were noted by a resolution adopted by the International Organization for Medical Sciences, which brought together Muslim physicians and jurists to deliberate on the issue; they called for a ban on using genetic technologies to enhance humanity (Shabana, 2022). On the other hand, licit therapeutic uses are defined as treatments that "restore the original (sound) condition" (Shabana, 2022, p. 11) of the human being because ailments, whether inborn or acquired, are exceptions from the general norm as the Divine created humans in the best of shapes (Q.95:4). Whether RLE is an alteration of human nature remains unaddressed, however, one could argue that RLE is indeed *radical* and impacts human nature. Nonetheless, in general, the use of medicine and biotechnology for therapeutic purposes warrants stipulated permissibility, while Islamic jurists prohibit the use of genetic intervention for enhancement (Shabana, 2022). This judgment offers precedent for ruling out genetic interventions for RLE.

Online fatwa are a key source of insight into the ongoing, public Islamic bioethics discourses (Mohiuddin et al., 2020; Padela, 2007; Van den Branden & Broeckaert, 2011). Notwithstanding that transhumanism is not

fully discussed at juridical council meetings, some public fatwa do comment on the topic. In response to a questioner seemingly inquiring about transhumanist interventions to "improve humans" so that they can "think much faster" and "have extra muscle, bigger and stronger bones" and possibly become "new humans," a prominent online juridical academy deferred stating that "leave it until it happens" (Islamweb, 2008). This "wait and see" approach is emblematic of *fatwa* literature which is intrinsically grounded in practical reality. Further, jurists do not fully explicate notions of the normative body, nor expound on conceptions of human nature within their *fatwā,* thus leaving these discussions to other scholars and venues. Notably, in meting out licitness, Islamic jurists consider there to be a clear dividing line, grounded in either biology, sociology, or professional ethics, between therapy and enhancement. With respect to RLE and other such interventions, the line is fuzzy, given the gap in identifying what human nature is. However, a further comment on Q.4:119 may clarify the proverbial red line. Exegetes hold various opinions about the phrase in question. Among them are interpretations that view the verse as speaking about Satan inspiring humans to attempt aesthetic enhancements of the human form, or to undertake significant changes in human attributes and dispositions. This reading further bolsters Islamic moral arguments against transhumanism (Lala, 2020).

One could construct an argument for RLE based on the idea that preserving life, *ḥifẓ al-nafs*, is of paramount importance to Islamic ethics and law. Such a claim, however, would be countered in two ways. First, preservation is not equivalent to radical prolongation of a thing; life preservation thus signifies protection of life when it is threatened, or upholding its sanctity. Second, there are well-founded claims that the preservation of religion is the overarching prime objective of Islamic law. There is no consensus amongst classical or contemporary scholars as to which reserves the primary position when comparing the two. More importantly however, juridical verdicts on life-sustaining and life-preserving medical treatments do not summarily obligate the preservation of life at all costs. Rather the established position of the Sunni schools is that medical treatment is not obligatory, and that human inviolability and sanctity can be threatened by continued life-sustaining measures. Thus**,** life-sustaining treatment must be calibrated in light of the goal of restoring capacity for merit-making. When the capacity is lost and cannot be restored by medical treatment than the harms to human dignity outweigh continued treatment. These nuances do not necessarily have a direct impact on RLE where the body remains intact. Yet, when considering transhumanism where one might need to alter the human body or replace it, human dignity might be threatened (as noted above) (Padela & Qureshi, 2019; Qureshi & Padela, 2016).

While the legal literature comments on the end goal of medical interventions related to transhumanism, it does so indirectly. To fill in the gap, one may examine theological or philosophical writings of Muslim intellectuals taking on the topic of transhumanism. Regrettably, there are but a few scattered academic pieces at the intersection of Islam and transhumanism.[22] Yet, theological concerns with transhumanism are noted in these pieces. Overall, Muslim intellectuals largely take the tactic of demonstrating that transhumanism's philosophical commitments to materialism and naturalism clash with the morally edifying mission of the Islamic tradition. Bereft of the notion of an afterlife and of a self that needs to be cultivated, the transhumanist vision appears to have no higher ideals as human nature is rendered as a soulless mind that strives to continue experiencing this worldly existence without a telos. In addition to the Satanic impulses driving changing of one's nature grounded in the Qur'anic verse 4:119, multiple commentators see inspiration for transhumanism in the Qur'anic account of Pharaoh. For example, they read verse 28:38, where Pharoah comments that there is no God for the Israelites but himself and asks for a structure to be built so that he can see the God of Moses, as demonstrating a motivation to become God-like and that using technology to enhance oneself beyond species-specific capacities draws from the same well (Hejazi, 2022). Consequently, a medical practice, alike radical life extension, that adopts human immortality as its ultimate goal is deemed morally bankrupt. These theological concerns, in our view, are accurate and comprise the core of an Islamic bioethical perspective on RLE.

A Final Word: Multidisciplinary and Multi-level Islamic Bioethical Deliberation concerning Transhumanism is Needed

In our view, the underlying motivations for RLE and other transhumanistic interventions contravene Islamic moral ideals. Yet, a comprehensive Islamic bioethical perspective on transhumanism remains wanting. Transhumanism is but a harbinger of various ideologies and worldviews that will shape the future of medicine and healthcare. Jurists, clinicians, bioethicists, policymakers, social scientists, and other relevant experts must come around the dialogue table to discuss the epistemic, philosophical, and practical aspects of an "Islamic" medical practice in the present context as well as for the future. We have outlined a process model for such multidisciplinary deliberative exercises and illustrated how such evaluations must be multitiered in that they consider the multidirectional relationships between state and local policies and the ethics of bedside practices elsewhere (Padela et al., 2021). We have also commented on, as above, the necessity of bringing together agent, act, and outcome-based

[22] This should not be surprising for the literature gap motivated this special collection.

moral frameworks from within the Islamic tradition when conducting bioethical analyses (Padela, 2024). While the reader is directed to these pieces for a better sense of the "how," we offer an added remark on the "what" below.

Specifically, a fuller Islamic bioethical evaluation must involve at least three types of analysis: theoretical/conceptual, practical, and applied. The case of RLE demands deep thinking about human nature and whether aging and death are intrinsic to that nature. Only after these concepts have been fleshed out can one consider whether aging is a human malady that could be categorized as a disease within an Islamic worldview.

Moving to the practical register entails considering the medical profession's role, namely, its embeddedness within society and its instrumentalization for societal goals. Drawing upon Islamic theology and philosophy, one would detail the normative doctor and outline their remit vis-à-vis patient health and societal goals. Theological concepts such as changing the nature of creation and human nature would link the theoretical with the practical as they would flesh out the contours of medical practice with nuance and specificity. Similarly, the conceptual and practical distinctions between therapy, enhancement, and alteration must be demarcated, as a fuller Islamic bioethical evaluation must link up with an overall metaphysics and philosophy for medical practice. A practical analysis of the goals of medical practice must also be undertaken in light of views on the future of humanity, specifically per eschatological doctrines.

An applied bioethics evaluation can be undertaken only after identifying the practical dimensions of Islamic medical practice. Applied Islamic bioethics would involve using casuistry to address whether a specific intervention for a specific patient within a specific context is licit according to Islamic law. This level mirrors the fatwā-making enterprise but has the added advantage of the prior conceptual and practical work. Instead of just looking to prior legal precedent, jurists could connect their judgments to Islamic views on health, disease, and doctoring; in other words, their judgments would flow out of a larger moral vision for healthcare. In our view, Islamic bioethical deliberation that is multidisciplinary, multitier, and multilevel will be more robust in attending to the ethical problem spaces of modern biomedicine and contemporary healthcare.

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