# Anatomy of Musculoskeletal System in the Light of the *Qur'an* and *Hadith*.

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**ABSTRACT**

The integration of human knowledge between the medical and health care sciences with revealed knowledge was established since the era of Al-Razi (Rhazes), Ibn Sina (Avicenna), Ibn Rushd (Averroes), Al-Zahrawi (Albucasis) and others. However, the glorious period of Islamic medicine gradually declined after the period of *'Abbasiyyah* and *'Uthmaniyyah*. At present, many scholars tend to separate the modern medicine and the revealed knowledge, resulting in the disconnection between these two fields. There is little to suggest the presence of reference collections that integrate the *Qur'an* and *Hadith* with medicine. This review aimed to fill that gap. Relevant Qur'anic verses and authentic *Hadith* of the Prophet Muhammad (peace be upon him; henceforth PBUH) in relation to a specific field in medicine i.e. the anatomy of human musculoskeletal system was extracted. The musculoskeletal system is unique in which it forms the 'backbone' of normal human posture. The system plays a vital role in maintaining human daily activities. From this review, it is noted that many Qur'anic verses and *Hadith* relate to the musculoskeletal system. A few examples include the number human joints and its relationship with the daily prayers (*Salah*), the daily charitable act recommended to all Muslim, the coccyx bone that is indestructible and shall be the source for human resurrection during the hereafter, and others. These examples necessitate for a more in-depth analysis to enlighten the revealed knowledge from the medical perspective.

**KEYWORDS**: anatomy, musculoskeletal, bone, joint, *Qur'an*, *Hadith*.

**INTRODUCTION**

The review was conducted due to limited references integrating the anatomy of the musculoskeletal system with revealed knowledge, despite numerous verses related to it. It is aimed to bridge between the gross anatomy and histology of human musculoskeletal system with the Qur'anic verses and *Hadith* (words, deeds, and approvals of Prophet Muhammad PBUH collected by authentic narrators). The authors try to extract as many Qur'anic verses and *Hadith* related to this system and classify them in a systematic manner. The first part of the manuscript will discuss the literature findings of the macroscopic and microscopic anatomy of the musculoskeletal system. The latter part will present the related Qur'anic verses and *Hadith*. The main focus areas are mainly on the human bones and joints where most of the verses and *Hadith* were narrated.

DISCUSSION
The Anatomy of the Musculoskeletal System

Human anatomy is the science of the structure and function of the human body[1] which is made up from the gross (macrostructure) and histology (microstructure) components. It can be divided according to the body systems such as cardiovascular, respiratory, gastrointestinal, hepatobiliary, urinary, reproductive, musculoskeletal, nervous and endocrine systems. The human musculoskeletal system can further be divided into several different elements, namely the bones, joints, cartilages, muscles, ligaments, and tendons. Each of these elements plays a vital role in maintaining the body posture, movement, support and protection to vital organs. In addition, it also acts as a production site for blood elements and serves as a storage system for calcium and phosphate for body homeostasis.[2, 3]

*The Anatomy of Bones*
A bone is an organic matrix of fibrous connective tissues that is impregnated with mineral salts, where the former provides the toughness and elasticity while the latter provides hardness and rigidity.[4] A bone is also known as a bioceramic, protein-mineral composite living tissue and categorized based on its macrostructure and microstructure.[5,6] The macrostructure of the bone is divided into two categories partly based on its porosity; cortical and trabecular bone. Cortical bone, also known as compact bone, is dense and found primarily in the shafts of long bones and the outer covering shell of all bones as it provides mechanical strength and protection.[7] Trabecular bone, also known as cancellous or spongy bone, consists of bony trabecular struts and marrow-filled cavities and is organised for load-bearing. It is more active metabolically than cortical bone and remodels more often.[6,8,9] The macrostructure of the bone is based upon its microstructure and consists of a hierarchical structure of osteons (Haversian systems), lamellae, collagen fibres, embedded minerals and non-collagenous organic proteins. The major difference between cortical and trabecular bone is the arrangement of trabecular bone into struts of rods and plates interspersed with marrow.[8]

The human skeleton can be divided into the axial skeleton and the appendicular skeleton. The axial skeleton consists of bones of the head (cranium), neck (hyoid and cervical vertebrae) and trunk (ribs, sternum, and vertebrae), while the appendicular skeleton consists of bones of the upper and lower limbs including the pectoral and pelvic girdles.[3] At

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birth, 270 bones make up the human skeleton, and it is finally reduced to 206 in adulthood due to the fusion of certain types of bones.[10] For example, the five sacral vertebrae that are present during childhood will eventually fuse into one complete sacrum in an adult.[11]

Despite the multifunction characters and great strength of the bone, it is a very lightweight material, with the skeleton only making up around 20% of total body weight.[12] This lightweight yet resilient design perfects the mechanical function of the skeleton without compromising the functional requirements of the material. The stiffness and strength of the bone are determined by the content and quality of its components: approximately 70% minerals (mainly hydroxyapatite), 22% proteins (90% type I collagen) and 8% water.[6,13] How the resulting materials are arranged with minor constituents of non-collagenous proteins are thought to play an important role in bone formation.[14]

*The Anatomy of Joints*

The human joint is defined as unions or junctions between two or more bones or skeletal elements, with or without a joint cavity.[3] It is a crucial aspect in skeletal morphogenesis required for mobility in vertebrates.[2,15] In the human body, joints can be classified into synovial, fibrous or cartilaginous, based on the type of tissues that unites the articulating bones.[1]

A synovial joint has a joint cavity separating the two bony elements, while the solid joint (cartilaginous, fibrous) has no cavity between the bony elements and the bony components are united by connective tissue.[2] The three types of joints (fibrous, cartilaginous and synovial) show the differences in development between and within them.[16] The joints can also be categorised as diarthrosis, amphiarthrosis and synarthrosis[17,18] according to its ability to permit movement.

The characteristics of a synovial joint are the presence of the joint cavity, synovial membrane, synovial fluid, fibrous capsule and articular cartilages that cover the articulating bones. Many large joints in the human body are of synovial articulations, for example, the shoulder, elbow, hip, and knee, and are classified according to the shape of the articulating surfaces or the movement.[1] The fibrous joint is a joint connected by fibrous tissue, such as suture in the skull, gomphoses (between the root of teeth and its bony socket), and syndesmoses (ligaments such as ligamentum flavum of vertebrae or interosseous membrane that links the radius and ulna).[2,3] The cartilaginous joint, as the name implies, is a joint connected with cartilage in between them, for example, the symphysis pubis and the intervertebral joints.

At present, there is a lack of scientific literature that discusses the exact number of joints in the human body, with non-academic writings stating numbers ranging from 300 to 400 joints. It is partially because the total number is dependent on the age of a person. As the number of bones in the human body reduces from 270 at birth to 206 in adulthood[10] the effect of this change must somehow affect the number of joints throughout human development. Moreover, the definition used to describe some joints also varies among literature. For example, the sacroiliac joint has variable descriptions: synovial, partly synovial partly syndesmotic, amphiarthrosis or synarthrosis.[3,18,19] It was thought that the sacroiliac joint is not a synovial joint as it does not allow free movement and lacks the presence of a cavity. The disparity in the definition of joints contributes to the inconclusive total number of joints in the human body.

*The Anatomy of Cartilage*

The cartilage is a resilient, semi-rigid connective tissue that supports bones, providing a smooth surface for bone articulation at joints and enables the growth and development of bones.[2] In general, there are three types of cartilages that vary according to the amount and kind of extracellular fibres in the matrix: the hyaline cartilage has few fibres, the elastic cartilage contains mainly elastic fibres and the fibrocartilage exhibits abundant collagen fibres.[20] The human joint is mainly lined by the hyaline cartilage that lacks perichondrium, thus having no capacity to regenerate new cartilage following damage. The cartilage in human joints acts as a shock absorber and provides smooth surfaces for gliding movement between the articulating bones.

*The Anatomy of Muscles*

The muscles in the human body can be classified into three distinct types based on the characteristics relating to voluntary or involuntary controlled, striated, or non-striated (when viewed under the microscope), and whether it is related to the body wall (*soma*) or *viscera*. The three types of muscles are the skeletal muscle, the smooth muscle, and the cardiac muscle[2], where the skeletal muscles form the majority of muscle tissues in the human body. The skeletal muscle is a voluntary somatic muscle, as humans can control the movement of their body parts. This muscle functions in supporting and moving bones and the skeleton in humans.

The other two muscle types are the smooth muscle and cardiac muscle. The former constitutes the walls of hollow viscera (i.e. gastrointestinal tract, respiratory tract, etc.) and blood vessels, and it is an involuntary muscle controlled by the autonomic nervous system. The cardiac muscle, as the name implies, is found in the heart, forming the myocardium wall, and to a certain extent, the cardiac muscles line the great vessels (aorta and vena cava) next to the heart. It is also an involuntary type of muscle where the rate and strength of contraction is controlled by the autonomic nervous system.[3]

Qur'anic verses and *Hadith* related to the musculoskeletal system

The *Qur'an* is the divine book for Muslims which was first revealed in the year of 610 CE, around 1400 years ago. It was sent down to the Prophet Muhammad PBUH (570 CE – 632 CE) through the angel Gabriel, as narrated in the Sahih Bukhari[21] (Book 1, no. 3) and the Sahih Muslim[22] (Book 1, no. 160). The first few verses of the *Qur'an* were revealed from *Surah Al Alaq* (Chapter 96:1-3), that read as "*Read in the name of your Lord, who has created everything, who has created man from a clot. Read! And your Lord is the Most Generous*".

The *Qur'an* which is in Arabic language, was sent in stages throughout a period of 23 years of prophethood, where it was revealed during the 13 years of prophethood in Mecca and then throughout the 10 years in Medina, Saudi Arabia.[23] The book is organised into 114 chapters, and consists of 6237 verses, and deals with divine nature, stories of the many prophets, kingdoms, and lessons learned from observation of nature, life, and history. It also deals with matter related to faith, worship, promoting

peace, constant charity, social justice irrespective of social status, and many others.[24]

*Hadith* is the words, deeds, approvals of Prophet Muhammad PBUH collected by authentic narrators. A *Hadith* consists of two parts, the text and the chain of narrators. A text may seem to be logical and reasonable but it needs an authentic chain of reporters with the characteristics of reliable reporters for it to be acceptable.[25] Thus, the authenticity of a *Hadith* relies on the reliable chain of narrators with the logic and reasonable text. Al-Suyuti (1445 CE – 1505 CE) in his book *Tadrīb al-Rāwi*[26] quoted from Ibn Al-Jawzi who said, "If you find a prophetic narration disagreeing with sound reason, contradicting established revelation, or conflicting with the principles, then know that it is inauthentic." The study on the science and authenticity of the *Hadith* is called as *Mustalahul Hadith*, the knowledge of evaluation and classification of *Hadith*.[27] The current analysis will only extract authentic *Hadith* of the Prophet related to the musculoskeletal system in humans.

Although the *Qur'an* is not a book of science and was revealed 1400 years ago, there is a substantial number of verses in the *Qur'an* relate to scientific knowledge, and gradually discovered by modern scientific research. For example, the stages of human development were mentioned in *Surah Al Hajj* (Chapter 22:5), *Surah Al Mu'minun* (Chapter 23:12-14), *Surah Al Ghafir* (Chapter 40:67) and *Surah Al Insaan* (Chapter 76:2). Many literatures discussed the embryological aspect of human development with reference to Qur'anic verses by describing the process of human development.[28,29,30,31,32]

Most of the references are based on *Surah Al Mu'minun* (Chapter 23:14), "*Then We made the sperm into a clot of congealed blood; then of that clot We made a (foetus) lump; then we made out of that lump bones and clothed the bones with flesh; then we developed out of it another creature. So blessed be Allah, the best to create!"* The word '*Alaqah*' (blood clot) used in the verse above refers to the suspended structure, a leech-like structure (human embryo) hanging in the endometrial wall of the uterus. The '*Mudghah*' (lump) in Arabic means 'the chewed substance', referring to the somites that will give rise to most of the axial skeleton and its associated structures.[33]

Despite of a huge interest in the human embryology on the verses in the *Qur'an*, there are very limited scientific references pertaining to the musculoskeletal system in relation to the Qur'anic verses and *Hadith*. The later parts of this paper will discuss selected eight Qur'anic verses and ten *Hadith* related to this system.

*Qur'anic verses related to the musculoskeletal system.*

Bone
The word 'bone' is stated at least six times in the *Qur'an*:

*During embryological process*

In *Surah Al Baqarah* (Chapter 2:259), "*Look further at the bones, how We construct them and then cover with flesh (lahm).*"

The verses in Chapter 2 emphasize on the study and research on bones where Allah instructs us to "Look further at the bone, how We construct them". In the advances of current technology, the human bone although possessing strength and rigidity for weight bearing, locomotion and protection of the vital organs, they are relatively lightweight materials.[6,12,13] This mathematical design rule and optimum functional capacity are considered the best formula in designing the columns, beams and concrete materials in any building, without compromising the structure and strength.[34] Furthermore, the human bone is designed to adapt to the internal and external forces and weight where the trabecular patterning of the cancellous bones are lined in the preferential orientation according to the stress area, which gave rise to the well-known Wolff's law and functional adaptation theory by Wilhelm Roux.[8,9]

In *Surah Al Mukminun* (Chapter 23:14), *"Then we made the sperm into a clot of congealed blood; then of that clot We made a (foetus) lump; then we made out of that lump bones and clothed the bones with flesh; then we developed out of it another creature. So blessed be Allah, the best to create!"*

In the verses of Chapters 2 and 23 above, it is suggested that during the developmental process of the embryo, the bones were made earlier than the muscles. The embryo development took place between the 3rd weeks following fertilization up to the 8th week, after which the fetal period occurs that lasts until the 9 months of pregnancy. During the embryo period, the skeletal system is formed at the end of the 3rd week from the neural crest, lateral plate, or paraxial mesoderm, where the latter becomes the segmented somites that differentiate between sclerotome and dermatomyotome.[35,36]

Subsequently,the sclerotome cells form the mesenchyme, the embryonic connective tissue that has the ability to migrate and differentiate into fibroblasts , chondroblasts or osteoblasts (bone-forming cells). It is at this stage that the bones are formed either through the process of intramembranous ossification where the mesenchymal cells directly transform into osteoblast, or endochondral ossification where the pre-existing cartilaginous model become ossified.[7,11,36] The skeletal muscles are formed following the sclerotome forming the mesenchymal cells. It is activated by WNT proteins that direct the dermatomyotome part of the somite to form the muscle precursor cells and to express the MYF5, the muscle specific genes.[36] In addition, the upper and lower limbs are formed from the limb buds as the mesenchymal core of the lateral plate mesoderm that will eventually differentiate into future bones and connective tissues of the limbs. The bones and connective tissues of the limb buds are covered by the cuboidal ectoderm, with the apical ectodermal ridge (AER) forming at the edge of the limb buds. While the limb buds continue to grow, the muscles start to form at the farthest area from the AER.[36] The myoblasts, muscle-forming cells aggregate and form large muscle mass following the formation of the long bones, covering the dorsal (extensor) and ventral (flexor) components of the upper and lower limbs.[33] The findings conform to the verses of Chapter 2 (259) and Chapter 23 (14) where the bones were constructed earlier than the muscles and were then wrapped by the muscles.

*Origins of man and its relation to musculoskeletal system*
In *Surah At-Tariq* (Chapter 86:7), "*Emerging from between the backbone and the ribs.*"

This verse refers to the origins of man's creation where the sperm, the male gametes will eventually fertilize with the ovum, the female gametes. The location of the backbone and the ribs in this verse marked the area of the abdominal cavity in human. Anatomically, in an adult the location of the testis (sperm-producing organ) is outside the human body, suspended in the scrotum by the spermatic cord.[2] At this stage, the verse seems unfit with the suggestion of the origins of the human. However, during the intrauterine development of the embryo, the testis is originated in the abdominal cavity, at the area between the ribs and the lumbar vertebrae and near the developing kidneys[3,36]. At the end of the 2nd month of embryo development, the testis descends from the medial side of the kidneys on the posterior abdominal wall. It passes inferiorly and laterally, crossing the ureter into the inguinal canal and finally inside the scrotum and brings along its testicular vessels, lymphatics, nerves, and vas deferens.[35,36] The verse 7 (Chapter 86) thus suggesting to the origins of the testis during the embryological period at the abdominal region. The origins of the female gonads (ovaries) are at the same location to that of the testis, where it is close to the developing kidneys. This is because the male and female gonads of the embryo do not differentiate until the 7th week of development.[36] However, the descents of the ovary are near from its original location and finally settle just below the rim of the true pelvis.

*Soul ended*
In *Surah Al Qiyamah* (Chapter 75:26), *"Yea, when (the soul) reaches to the collar-bone (in its exit)."*

The word '*taraqiy'* (singular *Tarquah* (الترقوةis defined as the clavicle based on *Al-Mawreed* A Modern Arabic-English dictionary.[37] Ibn Manzur quoted in his book *Lisan Al-Arab* (1993) that '*taraqiy'* means; 1. Two bones projected between the shoulder and the neck. 2. A bone that connects the neck and the shoulder regions.[38] It can be suggested that the human soul leaves the body ascending through the area between both clavicles during the end-of-life process.

*Fate of the human*

In *Surah Al Isra'* (Chapter 17:49), *"They say what! When we are reduced to bones and dust, should we really be raised up (to be) a new creation?"*

Ibn Manzur[38] defined the word 'bones' عظاماas the animal's organ wrapped with flesh. The next word '*rufata*' رفاتاtranslated by Al-Mawreed[37] as dust, remains, ruins, debris, broken remains, corpse. It could be understood from the verse that Allah indicated the bones are the only remains of human after death. Meanwhile the visceral and somatic tissues including the skeletal muscles wrapping the bones would eventually decompose into dust and soil ('*rufata'*). Ibn Kathir[24] said the the word '*rufata*' رفاتاmeans '*turab'* تراباwhich is the soil of the ground. It also could mean '*ghubar*' ,غبارا the dust.

In *Surah Al Mukminun* (Chapter 23:82), *"They said, when we have died and become dust and bones, are we indeed to be resurrected?"*

According to Qur'anic exegesis or interpretation by Ibn Kathir[24], these Qur'anic verses emphasized that the non-believers dismissed the concept of reconstruction of human life after body decomposition into bone and dust.

Muscle

*During embryological process*
In *Surah Al Baqarah (*Chapter 2:259), *"Look further at the bones, how We construct them and then cover with flesh (lahm)."*

In *Surah Al Mukminun* (Chapter 23:14), *"Then we made the sperm into a clot of congealed blood; then of that clot We made a (foetus) lump; then we made out of that lump bones and clothed the bones with flesh; then we developed out of it another creature. So blessed be Allah, the best to create!"*

These two verses conform to the suggestions of the chronology of the embryological process in human development as discussed earlier.

Joints

*At the battlefield*

In *Surah Al Anfal* (Chapter 8:12), *"(Remember) when your Lord revealed to the angels, verily, I am with you, so keep firm those who have believed. I will cast terror into the hearts of those who have disbelieved, so strike them over the necks, and smite over all their joints."*

Ibn Manzur[38] quoted a few definitions for the word which (بنانةsingular '*banaanah'* ( بنان'*banaan'* literally means fingers, or small joints of the fingers. It can also be referred to the upper and lower limbs in general. However, he mentioned that '*banaanah'* is referred to every joint, hence as apparent in the Qur'anic verse above. This is because the joint areas are the easiest part of the skeleton to be disintegrated especially the synovial joints.

Limbs

*During resurrection*
In Surah Al Qiyamah (Chapter 75:29*), "And one leg will be joined with another (shrouded)."*

Ibn Katsir[23] quoted the wordings by Al-Hasan Al-Basri which he translated the word '*saq'* ساق(leg) with *'rijlun'* رجلmeans both legs are joined together but unable to bear the body weight. In addition, Ibn Kathir[24] mentioned that this verse is a metaphorical verse where some Islamic scholars explained that the joined legs could also means difficulties upon difficulties during the Judgement Day.

*Several Hadith related to musculoskeletal system*

Bone
Narrated by Abu Hurayra, *"Allah's Apostle said, 'Between the two sounds of the trumpet, there will be forty." Somebody asked Abu Huraira, "Forty days?" But he refused to reply. Then he asked, "Forty months?" He refused to reply. Then he asked, "Forty years?" Again, he refused to reply. Abu Huraira added. "Then (after this period) Allah will send water from the sky and then the dead bodies will grow like vegetation grows, There is nothing of the human body that does not decay except one bone; that is the little bone at the end of the coccyx of which the human body will be recreated on the Day of Resurrection."*[21]

Narrated by Abu Hurayra that the Messenger of Allah (PBUH) said: *"There is no part of man that will not disintegrate, apart from a single bone at the base of the coccyx, from which he will be recreated on the Day of Resurrection."*[39]

Narrated by Abu Hurayra that the Messenger of Allah, may Allah bless him and grant him peace, said, "*The earth eats all of the son of Adam except the coccyx. He was created from it, and on it he is built.*"[40]

The Prophet (PBUH) said, *"Between the two Blowing of the Trumpet there will be an interval of forty." The people said, "O Abu Hurairah! Do you mean forty days?" He said, "I cannot say anything." They said, "Do you mean forty years?" He said, "I cannot say anything." They said, "Do you mean forty months?" He said, "I cannot say anything. The Prophet added: 'Everything of the human body will perish except the last coccyx bone (end part of the spinal cord), and from that bone Allah will reconstruct the whole body. Then Allah will send down water from the sky and people will grow like green vegetables'."*[41]

Coccyx or the 'tailbone' consists of four fused rudimentary coccygeal vertebrae located inferior to the sacrum, and it is the remnant of the vertebral skeleton during embryological development.[32] Despite being rudimentary and smaller in size compared to the rest of the human vertebrae, based on several *Hadith* mentioned earlier this bone is considered a unique bone that can withstand the natural process of decaying in the corpse. The current article suggests for more research and future investigation on the biochemical composition of the coccyx as to why it is indestructible and different from the rest of the bones in the body. In addition, from the embryological point of view, at the early part of the 4th week following fertilization, the primitive streak that was formed during the 3rd week finally shrinks and the remnant stays in the sacrococcygeal region.[35] This action results in maintaining the remaining stem cells in this region. This explains why some tumours in the coccygeal region called *teratoma* contain different tissues (muscles, skin, cartilage, bones and teeth as well), contrary to the tumours that exist in different regions.[32] The information here may provide some information on the uniqueness of the coccyx being the source for reconstruction during the Day of Resurrection as it may carry the blueprint of the human stem cells.

The four hadith above used the term '*ajbu az-zanab'* means 'the end or the final part of something', and in the hadith, the term '*ajbu az-zanab'* is referred to the type of bone. '*ajbu az-zanab'* in arabic is referred in the dictionaries, as '*al-'us'u's* (tailbone) as found in many arabic translations[37,38] and the term *al-'us'us* is widely translated as coccyx (in medical terminology).

Nevertheless, this terminology used by the prophet is an open phrase which could also be taken as indirect meaning. For example, the 'essence inside all bones', which can be interpreted as the final part after all the bones that already destroyed (i.e its stem cells or chromosomes).

Joint

*Several Hadith concerning the number of joints (360 joints) in the human body and the relationship of the joints with the act of charity*

Narrated by A'ishah r.a. "*Everyone of the children of Adam has been created with three hundred and sixty joints; so he who declares the Glory of Allah, praises Allah, declares Allah to be One, Glorifies Allah, and seeks forgiveness from Allah, and removes stone, or thorn, or bone from people's path, and enjoins what is good and forbids from evil, to the number of those three hundred and sixty, will walk that day having removed himself from Hell. Abu Taubah said: "Perhaps he said: 'Will reach the evening.'*"[22]

Narrated by Abu Buraydah, I heard the Messenger of Allah (PBUH) say: *"A human being has 360 joints for each of which he must give alms. The people asked him: Who is capable of doing this? He replied: It may be the removal of mucus (saliva) in the mosque which you bury and something you remove from the road; but if you do not find such, 2 rakahs (2 units of prayer) in the forenoon will be sufficient for you."*[42]
Ibn 'Abbas said, "*There are 360 joints and each of them owes sadaqa every single day. Every good word is sadaqa. A man's helping his brother is sadaqa. A drink of water which he gives is sadaqa. Removing something harmful from the road is sadaqa."*[43]

Narrated by Abu Dharr, the Messenger of Allah (PBUH) said, *"When you get up in the morning, charity is due from every one of your joints. There is charity in every ascription of glory to Allah; there is charity in every declaration of His Greatness; there is charity in every utterance of praise of Him; there is charity in every declaration that He is the only true God (worthy of worship); there is charity in enjoining good; there is charity in forbidding evil. Two rak'ah of Duha* (Forenoon prayer) is equal to all this (in reward)".[41]

Narrated Abu Huraira, Allah's Messenger (PBUH) said, *"There is a Sadaqa (charity) to be given for every joint of the human body; and for every day on which the sun rises there is a reward of a Sadaqa (i.e. charitable gift) for the one who establishes justice among people."*[21]

Narrated by Abu Hurayrah, *"Sadaqa is due on every joint of a person, every day the sun rises. Administering justice between two men is also a Sadaqa. And assisting a man to ride upon his beast, or helping him load his luggage upon it, is a Sadaqa; and a good word is a Sadaqa; and every step that you take towards prayer is a Sadaqa, and removing harmful things from the pathway is a Sadaqa."*[22]

The presence of all joints especially synovial joints in human is a grace from Allah whereby locomotion and human movement took place efficiently. Ibn Hajar Al Asqalani (1372 – 1449 CE) mentioned in his book, *Fathu Al Bari*[44] that Muslims are urged to do charity based on this grace bestowed upon human. The charity includes a wide context as it covers any good deeds from praising Allah, uttering good words, removing harmful objects from the roads, helping others and many more.

Although the scientific literature does not suggest the exact total number of human joints due to the age factor and disparity in the definition of the word 'joint' itself, the Islamic literature provides consistency among several authentic *Hadith* narrated by different scholars.[20,21,41] This may suggest that the exact number of joints in the human body, although debatable scientifically due to age factor and terminology definition, is proposed to be 360.
Interestingly, 1400 years ago Prophet Muhammad PBUH (570 – 632 C.E.) had specifically mentioned the exact number of 360 joints in the human body.[45] El-Naggar (2012) proposed that the 360 joints are representing the synovial joints in the human body[43], while referring to the book written by Dr.

Hamid Ahmed Hamid (The Journey of Faith inside the Human Body). He proposed that *"(147 joints in the vertebral column): 25 joints between the vertebrae, 72 joints between the vertebrae and the ribs, 50 joints between the vertebrae and the occipital condyles, (24 joints in the thorax): 2 joints between the bones of the sternum and the thoracic cage, 18 joints between the sternum and the ribs, 2 joints between the clavicle and the scapulae, 2 joints between the scapulae and the thorax, (86 joints in the upper extremity): 2 joints between the scapular bones, 6 joints between the elbows, 8 joints between the wrists, 70 joints between the hand bones, (92 joints in the lower extremity): 2 hip joints. 6 joints between the knee bones, 6 joints between the ankles, 74 joints between the feet bones, (11 joints in the pelvis): 4 joints between the coccyx vertebrae, 6 joints between the bones acetabulum, 1 joint of the pubic symphysis. The total number of joints: 360."*[45] Although the information given has not been verified by other scientific literature, it is interesting to note that the detail calculation for the 360 synovial joints does exist and has been published earlier.

During the prophetic period (570 – 632 C.E.) very limited scientific equipment existed. The first radiography machine to x-ray human bones was invented 400 years later, which was in 1895, by a German Physicist, Wilhelm Röntgen who discovered the electromagnetic radiation in a wavelength range[46]. In addition, during the early years of the invention of radiographic machines, it could not possibly discover the small, synovial joints in the human body, for example, the two temporomandibular joint, an atlantoaxial joint, ten metacarpophalangeal joints, etc. This is because the resolution of radiographic machines during Röntgen's time was very low compared to the modern high-resolution computed tomography scan machine.

Conclusion

The listed verses discussed several different issues including the stages of human development, the original location of human gonads, the indestructible coccyx to reconstruct human during Judgement Day, and many more. However, the Qur'anic verses and *Hadith* presented are not exhaustive. It is hoped that this article would serve as the initiator for progressive research on this area. More exploration is needed to bridge between the divine and scientific knowledge to promote a comprehensive and holistic understanding of the anatomy of human musculoskeletal system.

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