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**Enhancing Student Spiritual Awareness through Understanding Human Physiology: A Case Study of Biomedical Science Course**

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| **Article History:**  Received: xxxx xx, 20xx  Revised: xxxx xx, 20xx  Accepted: xxxx xx, 20xx  Available online xxxx xx, 20xx  **\*Correspondence:**  ***Address:***  Tamangapa Modern Land 2, Makassar, Indonesia 90235  ***Email:***  nur.almarwah@uin-alauddin.ac.id  **Keywords:**  biomedical science course, human physiology, Islamic integration, spiritual awareness | **Abstract:**  The imperative of spiritual awareness among the younger generation is widely acknowledged. Amidst this backdrop, the exploration of methodologies to augment spiritual awareness has garnered significant attention. For this reason, this research examined increasing spiritual awareness through in-depth learning about the human body. This study aimed to examine the augmentation of student’s spiritual awareness facilitated by an understanding of human physiology. The research method used qualitative research with a case study approach. Data were collected through multiple avenues, including direct observation, interviews, and document analysis. The object of the research is Biomedical Science Course with informants from students and teachers. The results show an increase in spiritual awareness from a deep understanding of the physiology of the human body and understanding the integration of Islam with the topics contained in it. There are four main study materials as part of the lesson: Cell Biology and Genetics, Anatomy and Physiology, Homeostasis, and physics and biochemistry in the human body. Understanding these parts increased spiritual awareness in several ways. First and foremost, studying the intricacies of human anatomy and physiology often results in a deep appreciation of the complexity and beauty of creation. Understanding the extraordinary design and function of the human body can inspire a sense of awe and reverence for Allah SWT. |

**INTRODUCTION**

Spiritual awareness plays an important role in shaping students’ ethical and moral values, spurring the development of compassion, empathy, and a deeper understanding of self and others. (Romlah and Rusdi 2023). It opens up a broader outlook on life, helps students face challenges, builds resilience, and maintains mental and emotional balance.

In Islam, spiritual awareness can be enhanced through a variety of activities, including consistent worship routines and Islamic healing, especially through the practice of *zikir* (Rusaini and Idris, 2019). In addition to personalized routines. Spiritual awareness raising can also be provided through forms of knowledge and awareness raising through learning, education, and religious activities. (Syafi'i and Mardiyah 2023). Religious education in a more varied way, utilization of technology, relevance to curriculum development, and a narrative that is close to the person can be a strategy in Islamic religious education (Romlah and Rusdi 2023). Islamic education can also be done by integrating Islamic values in general science. Science education is part of the Islamic teachings that are integral to life (Nurcholis 2021).

Science education that is integrated with Islam can be seen in the courses found in general knowledge study programs on Islamic campuses. Contemporary science carried out by Islamic universities has a greeting character that combines religious and general sciences and eliminates the dichotomy between sciences (Hanifah 2018).

This Islamic integration is also seen in the learning of Basic Biomedical Science courses conducted in health study programs at Islamic Universities. Learning about the physiology of the human body can be utilized as a medium to understand the greatness of Allah. An understanding of the human body, particularly in the context of its complex design and function, can lead to a deeper appreciation of God's creation, thereby increasing spiritual awareness. In relation to learning about the human body, a deep understanding can enhance spiritual awareness by understanding the human body as God's creation.

Overall, the synthesis of these references suggests that education, and the integration of Islam in the sciences, can serve as an avenue to enhance spiritual awareness in individuals, thereby fostering a deeper connection with spirituality within an Islamic framework.

However, while spirituality enhancement has been widely practiced, there is still a lack of enhancing spiritual awareness through an understanding of the human body in the context of higher education. An understanding of integration that can lead to a deeper knowledge of the human body as part of a larger natural order is expected to contribute to the enhancement of spiritual awareness.

This study was conducted not only to describe the relationship between spiritual awareness and understanding of the human body, but also to provide an overview of increasing spiritual awareness through Basic Biomedical Science Learning by looking at the relationship between two aspects, namely: Study materials taught in the Basic Biomedical Science Course, Islamic Integration Studies in theories of Human Body Physiology, and Increased spiritual awareness in students.

**METHODS**

The method used in this research is qualitative research with a case study approach. This qualitative research describes the Basic Biomedical Science Course Learning for Semester 1 Students in the 2023-2024 academic year of the Nursing Study Program, Faculty of Medicine and Health Sciences, UIN Alauddin Makassar with a focus on three aspects, namely Basic Biomedical Science study materials and their relationship to Islamic integration studies, as well as Increasing Spiritual Awareness.

There are two data sources used, namely primary and secondary data sources. Primary data sources consist of some information from interviews with Semester 1 students in the 2023-2024 academic year from the Nursing Study Program, Faculty of Medicine and Health Sciences, UIN Alauddin Makassar and lecturers teaching Basic Biomedical Science courses. Secondary data sources consist of books, journals, RPS, and Basic Biomedical Science Course Modules.

Data collection techniques are three techniques, namely data collection, interviews, and documentation. Data analysis techniques carried out based on the theory (Mudjia Raharjo), 2017, namely by reading the entire transcript of general information results, compiling general information to be taken into *specific messages*, grouping general patterns of data. Testing the validity of the data using the data source triangulation technique, which is to explore the truth of certain information. In this case comparing the results of interviews from student informants and teaching lecturers, as well as conformity with secondary data.

**RESULTS AND DISCUSSION**

**Understanding Physiology in Basic Biomedical Science Learning**

Basic Biomedical Science is a course that must be studied by students in the health sector. Basic Biomedical Science is a science that studies anatomy, physiology, biology, chemistry, and physics in explaining life phenomena from the cellular level to organs and the human body as a whole. (Abadi et al. 2023) Basic Biomedical Science knowledge is the foundation in health science. Especially for nursing students. Knowledge of anatomy and physiology and the mechanisms that occur in the body are the basis used in providing nursing care. This knowledge is the basis for events that occur in various conditions of the human body. (Asrul 2021)

Based on the Curriculum of the Nursing Study Program (Nursing Study Program 2021) Basic Biomedical Science is a course that is part of a group of basic sciences that discuss the concepts of biology, physics, biochemistry, nutrition with regard to the environment and scientific ethics, as well as concepts of human anatomy and physiology in maintaining body homeostasis.

There are 4 main study materials that are part of this Learning: Concepts of Cell Biology and Genetics, Concepts of Anatomy and Physiology of the Human Body, Body Homeostasis and Principles of Physics and Biochemistry in the body.

Cell biology is the knowledge of cells in the human body. In the organization of the human body, cells are the smallest unit of human life. Cell biology discusses cells, the benefits of cells in life, and the genetic material contained in cells. It also includes how cells in the body communicate with each other. Cells that have the same function will form tissues. Tissues that come together and have the same function will form organs. Organs work together with other organs in organ systems. The human body will work properly as a result of coordination of all organ systems in the body.

Understanding human anatomy and physiology is an important basic concept for health students. The anatomy of the human body is an understanding of the organs in the body. While the physiology of the human body refers to understanding the mechanism of the system that works in the body. There are at least 10 systems studied in understanding the human body, namely: The nervous system, endocrine system, reproductive system, urinary system, integumentary system, musculoskeletal system, respiratory system, cardiovascular system, digestive system, and immunological system (Asrul 2021).

In order to comprehensively understand the physiology of the human body, it is also necessary to know about homeostasis. Homeostasis is a fundamental biological process that involves maintaining internal stability and balance in an organism, despite changes in the external environment (Hall and Guyton 2021). It encompasses a variety of physiological mechanisms that regulate parameters such as body temperature, blood glucose levels, and immune responses to ensure optimal body function. The immune system, for example, plays an important role in maintaining homeostasis by interacting with the microbiota to maintain a mutualistic relationship between the host and the microbial community (Gao et al. 2018). So many roles of homeostasis in the human body, homeostasis occurs in all systems of the human body. At the cellular level, regulation of cell homeostasis is influenced by proteins that induce selective autophagy and changes in organelle morphology (Zhu, Wang, and Wang 2021). There are also examples of homeostasis in maintaining sugar levels. The homeostatic model assessment of insulin resistance (HOMA-IR) is used to evaluate insulin resistance, emphasizing the importance of maintaining glucose homeostasis in human physiology (Ojo et al. 2022). Living things known as microbiota also affect homeostasis such as, gut microbiota has been shown to have an impact on gut immune homeostasis and overall body health (Gao et al. 2018).

In addition to homeostasis, an understanding of physics and biochemistry is also required for a fundamental understanding of the human body. The use of physics in healthcare affects two important aspects: pathophysiology and therapy. Physiology/physical physics can explain the functions of the human body and related conditions, both in health and illness. In therapy, physics knowledge is utilized in many tools used for diagnosis, healing and rehabilitation of patients. In physics principles, biomechanics, biooptics, bioacoustics, and thermodynamics affect the human body.

**Islamic Integration Studies in Human Physiology**

Human body physiology refers to the study of the functions and working mechanisms of biological systems in the human body. It covers various aspects, including organ function, the nervous system, the hormonal system, and metabolic processes. In the Islamic perspective, the physiology of the human body is linked to the concept of fitrah, which refers to the natural state or nature of humans created by Allah. This concept of fitrah includes the understanding that the human body is a gift from Allah that must be preserved and treated well.

In the Qur'an, there are many verses that emphasize the importance of taking care of the body as a trust from Allah. One example is in Surah Al-Baqarah verse 195, which states that the body should be taken care of and should not be wasted. The Islamic perspective emphasizes that maintaining a healthy body is part of worship, and that physical and spiritual health are intertwined.

In addition, the concept of health in Islam also includes social and environmental aspects. According to the Islamic perspective, maintaining a healthy body also means keeping the environment and society healthy. This is in line with the concept of physiology of the human body, which considers the interaction between the human body and its external environment.

Thus, the Islamic perspective on the physiology of the human body emphasizes the importance of maintaining a healthy body as part of obedience to Allah, as well as paying attention to the relationship between the body, environment and society in achieving holistic health.

To relate the concepts of cell biology and genetics to Quranic verses, it is important to consider the relevance of these scientific concepts to Quranic teachings. The Quran provides guidance and knowledge that can be related to various aspects of life, including scientific phenomena. In the context of biology, Quranic verses can be interpreted to reflect the intricate and systematic nature of living organisms, including cellular and genetic aspects.

The verses of the Quran can be related to the concept of cell biology by emphasizing the creation and organization of living things. For example, the Quran mentions the development of humans from one cell, which is in line with the concept of cellular organization and development. The connection between scientific understanding and the teachings of the Quran, illustrates the Quran as a source of knowledge that is in harmony with biological concepts (Azzuhriyyah and Soleh 2023).

Similarly, the concept of genetics can be linked to the Quranic perspective on the inheritance of traits and the diversity of living things. Quranic verses that discuss the transmission of traits and the creation of diverse species can be correlated with genetic principles such as heredity and variation. (Uswah Nur Fajriani et al. 2021). By exploring Quranic insights into the origins and characteristics of living organisms, it is possible to draw parallels with scientific understandings of genetic inheritance and diversity.

In the Islamic context, the concept of homeostatis is in line with the Islamic view of maintaining balance and equilibrium in various aspects of life. The Qur'an and Hadith emphasize the importance of moderation and balance in behavior, diet, and overall lifestyle. The concept of "Mizan" (balance) is central in Islam, which emphasizes balance in all aspects of life, including physical, mental and spiritual well-being. Islamic teachings advocate the maintenance of harmony within the self and with the environment, reflecting the homeostatic principle in biological systems.(Irawan 2017) Therefore, the concept of homeostatis in human physiology can be seen as consistent with Islam's emphasis on balance and moderation in all aspects of life.

**Increased Spiritual Awareness**

Increased awareness can occur with a deep understanding of a study and integrated with Islamic values that are harmonized in each topic of the explanation of the physiology of the human body. The concept of integration of Islamic values shows that there is a link between one science and another, in this case about the physiology of the human body and Islamic values. On the basis of this understanding, it can provide. This concept can aim to instill spiritual awareness about the connection between humans and nature.(Irawan 2017)

Educational approaches that address spiritual awareness are important in individual development. Learning about the body can enhance spiritual awareness by helping individuals to connect more with themselves and see the body as a sacred place to experience and express spirituality.

Studying the human body can enhance spiritual awareness in several ways. First and foremost, studying the intricacies of human anatomy and physiology often results in a deep appreciation of the complexity and beauty of creation. Understanding the incredible design and function of the human body can evoke a sense of awe and respect for the Creator.

From the results of interviews with students, they conveyed that they realized religiously how great God's power was over the detailed and visual explanation of the physiology of the human body. This is as stated by informant 1:

*Masyaallah sekali ibu karena dari pembelajaran ilmu biomedik ini tambah terkesan dengan ciptaan Allah yang begitu teliti.* (Masyaallah, mom, because from learning biomedical science, I am more impressed with Allah's creation which is so meticulous).

This is similar to what informant 2 also said:

*Semua materi fisiologi yang sampaikan ini berkesan smuanya buu. Bahkan semakin terbuka pandanganku melihat kekuasaan dan keMahaBesaran Allah, Allah Maha Besar betul bu*😭 *pokoknya bu terkagum2 sekali ka krn selama ini ndk ditau bgmna itu prosesnya terjadi. semakin kyk merasa bersalah karena masih sering lalai, pokoknya bu, setiap melihat video2 yg kita tampilkan terutama tentang saraf2 dan bagaimana sinyal2 itu berproses bu, sllu ka bilang, dehh begitu luar biasa penciptaan tubuh ta ternyata sepersekian detik ji bekerja itu smua.* (All the physiology material that was conveyed was memorable buu. In fact, my view is increasingly open to see the power and greatness of Allah, Allah is truly great, mom anyway, mom is amazed at how long you don't know how the process occurs. the more I feel guilty because I am still often negligent, anyway, mom, every time I see the videos that we show, especially about nerves and how the signals are processed, mom, you always say, dehh so extraordinary the creation of the body turns out to be a fraction of a second to work it all out).

The responses of the two informants regarding their views and what they felt after learning Basic Biomedical Science are in line with the results of research by Huda et al, that after knowing more about the brain and its intellect, their faith and laughter will increase to Allah SWT for His truly extraordinary creation. (Huda and Suyadi 2020)

Islamic spiritual awareness can be enhanced through learning about the human body. By understanding the anatomical layout and functions of the body, individuals can gain a deeper appreciation for the intricate design of the human body as God's creation (Kusnawan 2023). The body can serve as a reminder of God's existence and the importance of maintaining one's physical and spiritual well-being. Overall, learning about the human body can deepen one's spiritual awareness by recognizing the divine wisdom in its creation and understanding the role of the body in spiritual practices.

To enhance students' spiritual awareness through physiology education, it is important to integrate spirituality and spiritual care into the curriculum. Research has shown that educational programs focusing on spiritual care have resulted in the development of increased spiritual awareness, a more client-centered approach, improved communication skills, and personal impact among nursing and occupational therapy students (Leeuwen et al. 2008; Wang et al. 2022; Caldeira et al. 2016). In addition, the integration of spirituality and spiritual care in education has been shown to broaden students' understanding and knowledge of spirituality, leading to a holistic approach in meeting the needs of the mind, body, and spirit. (Caldeira et al. 2016). Furthermore, educational interventions have been effective in enhancing students' self-awareness and intra-spiritual competence, thus contributing to their overall spiritual development (Rykkje et al. 2021).

Incorporating spirituality into the undergraduate nursing curriculum has been found to positively impact student outcomes related to spiritual knowledge and attitudes (Wallace et al. 2008). In addition, the need to measure the development of students' competencies in spiritual care through their education has been identified, emphasizing the importance of assessing students' spiritual care competencies (Giske et al. 2022). Finally, addressing enablers in the areas of education and practice has been recommended to bridge the gap between the development and application of spirituality in nursing practice.

Integrating spirituality into the learning of body physiology can significantly enhance students' spiritual awareness, competence, and holistic approach in meeting individual needs. It is important to develop consensus-based educational standards, pay attention to spiritual well-being, and assess students' competency development in spiritual services to ensure effective integration of spirituality into learning.

**CONCLUSIONS**

Students' spiritual awareness can be improved with a deep understanding of the physiology of the human body studied in the Basic Biomedical Science course. Improvement can occur by integrating Islamic teachings with the topics studied in Basic Biomedical Science. There are four topics that are part of Basic Biomedical Science, namely: Cell Biology and Genetics, Anatomy and Physiology of the Human Body, Body Homeostasis, and Principles of Physics and Biochemistry. The implication of this research is the importance of in-depth understanding of the physiology of the human body integrated with Islam so that students can realize the power of Allah which can further increase students' spiritual awareness.

This research only examines teaching materials and their relationship to Islamic integration. Therefore, further research is needed related to effective learning methods, and the use of teaching media that can increase students' spiritual awareness.

**REFERENCES**

Abadi, Ellyani, MKes Siti Raudah, MSi dr Nina Indriyani Nasruddin, MGizi Muji Rahayu, Herlinda Djohan, MSi apt Mirnawati Salampe, MKes apt Besse Hardianti, Manogari Sianturi, Rantih Fadhlya Adri, and MSi dr Fika Tri Anggraini. 2023. *BIOMEDIK DASAR*. 1st ed. Jawa Tengah: EUREKA MEDIA AKSARA.

Aep Kusnawan, Dadan Suherdiana. 2023. “Virtual Media-Based Da’wah Education And Training : Increasing Public Awareness Of The Anatomy And A Healthy Lifestyle.” *CEMJP* 31 (1): 372–80. https://doi.org/10.57030/23364890.cemj.31.1.40.

Huda, Ahmat Miftakul, and Suyadi. 2020. “Otak Dan Akal Dalam Kajian Al-Quran Dan Neurosains.” *Jurnal Pendidikan Islam Indonesia* 5 (1): 67–79. https://doi.org/10.35316/jpii.v5i1.242.

Asrul, Nur Al Marwah. 2021. “Gambaran Tingkat Pengetahuan Anatomi Dan Fisiologi Pada Mahasiswa Program Studi Pendidikan Profesi Ners Angkatan XVI UIN Alauddin Makassar.” *Jurnal Kesehatan Pertiwi* 3: 179.

Azzuhriyyah, Imroatus Sholikha, and Achmad Khudori Soleh. 2023. “Konsep Manusia Sebagai Al-Basyar Dalam Al-Qur’an.” *Qolamuna : Jurnal Studi Islam* 08 (02).

Caldeira, Sílvia, Amélia S Figueiredo, Ana P d. Conceição, Regina C Ermel, João M G Mendes, Eliane C Chaves, and Emília C d. Carvalho. 2016. “Spirituality in the Undergraduate Curricula of Nursing Schools in Portugal and São Paulo-Brazil.” *Religions*. https://doi.org/10.3390/rel7110134.

Fadhila Rahmi, Anisa, and Rizqi Imelda Putri. 2023. “Meningkatkan Pentingnya Kesadaran Beragama Pada Generasi Z.” *Journal Islamic Education* 1 (4). https://maryamsejahtera.com/index.php/Education/index.

Gao, Jing, Kang Xu, Hongnan Liu, Gang Liu, Miaomiao Bai, Can Peng, Tiejun Li, and Yulong Yin. 2018. “Impact of the Gut Microbiota on Intestinal Immunity Mediated by Tryptophan Metabolism.” *Frontiers in Cellular and Infection Microbiology*. https://doi.org/10.3389/fcimb.2018.00013.

Giske, Tove, Annemiek Schep-Akkerman, Bodil B Våga, Pamela H Cone, Britt M Kuven, Wilfred McSherry, Benson Owusu, et al. 2022. “Developing and Testing the EPICC Spiritual Care Competency Self‐Assessment Tool for Student Nurses and Midwives.” *Journal of Clinical Nursing*. https://doi.org/10.1111/jocn.16261.

Hall, John E, and Arthur C Guyton Professor. 2021. *Guyton and Hall Physiology Review : Fourth Edition*. 4th ed. Elsevier.

Hanifah, Umi. 2018. “Islamisasi Ilmu Pengetahuan Kontemporer (Konsep Integrasi Keilmuan Di Universitas-Universitas Islam Indonesia.” *TADRIS: Jurnal Pendidikan Islam* 13 (2). https://doi.org/10.19105/tjpi.v13i2.1972.

Irawan, Irawan. 2017. “EKOLOGI SPIRITUAL: SOLUSI KRISIS LINGKUNGAN.” *Scientia: Jurnal Hasil Penelitian* 2 (1): 1–21. https://doi.org/10.32923/sci.v3i2.945.

Leeuwen, René v., Lucas J Tiesinga, Berry Middel, Doeke Post, and Henk Jochemsen. 2008. “The Effectiveness of an Educational Programme for Nursing Students on Developing Competence in the Provision of Spiritual Care.” *Journal of Clinical Nursing*. https://doi.org/10.1111/j.1365-2702.2008.02366.x.

Nurcholis, Moch. 2021. “Integrasi Islam Dan Sains: Sebuah Telaah Epistemologi.” *Falasifa : Jurnal Studi Keislaman* 12.

Ojo, Oluwafemi A, Jennifer C Amanze, Abosede I Oni, Susan Grant, Matthew Iyobhebhe, Tobiloba C Elebiyo, Damilare Rotimi, et al. 2022. “Antidiabetic Activity of Avocado Seeds (Persea Americana Mill.) in Diabetic Rats via Activation of PI3K/AKT Signaling Pathway.” *Scientific Reports*. https://doi.org/10.1038/s41598-022-07015-8.

Program Studi Keperawatan. 2021. *Kurikulum Program Studi Keperawatan Dan Ners*. UIN Alauddin Makassar.

Romlah, Sitti, and Rusdi. 2023. “Pendidikan Agama Islam Sebagai Pilar Pembentukan Moral Dan Etika.” *Al- Ibrah* 8.

Rykkje, Linda, Margrethe B Søvik, Linda Ross, Wilfred McSherry, Pamela H Cone, and Tove Giske. 2021. “Educational Interventions and Strategies for Spiritual Care in Nursing and Healthcare Students and Staff: A Scoping Review.” *Journal of Clinical Nursing*. https://doi.org/10.1111/jocn.16067.

Suredah, and Usri. 2020. “Kesalehan Ritual, Sosial, Dan Spiritual.” *ISTIQRA* 7 (2). www.imamsuprayogo.com/07/04/09.

Syafi’i, Imam, and Mardiyah Mardiyah. 2023. “Implementasi Kegiatan Keagamaan Dalam Meningkatkan Kecerdasan Spiritual Siswa.” *Jurnal Keislaman* 6 (1): 256–67. https://doi.org/10.54298/jk.v6i1.3715.

Uswah Nur Fajriani, Eva Fariha Nurulhusna, Achmad Syahputra, Sonia Ervinna, Rizhal Hendi Ristanto, Ade Suryanda, and Daniar Setyo Rini. 2021. “Penuntun Praktikum Koin Genetika Pada Materi Pewarisan Sifat Untuk Peserta Didik Kelas XII: Studi Pengembangan Dan Validasi.” *Proceeding of Biology Education* 4 (1): 170–80. https://doi.org/10.21009/pbe.4-1.16.

Wallace, Meredith, Suzanne Campbell, Sebastian P Grossman, Joyce Shea, Jean Lange, and Theresa T Quell. 2008. “Integrating Spirituality Into Undergraduate Nursing Curricula.” *International Journal of Nursing Education Scholarship*. https://doi.org/10.2202/1548-923x.1443.

Wang, Zhangyi, Yuan Liu, Haomei Zhao, Yue Zhu, Mengru Liu, Yajun Zhang, Xiao Liang, et al. 2022. “Spiritual Care Perceptions and Empathy of Chinese Nursing Students: The Mediating Roles of Spiritual Well-Being.” *Palliative & Supportive Care*. https://doi.org/10.1017/s1478951522001134.

Zhu, Lingxiao, Xinxia Wang, and Yizhen Wang. 2021. “Roles of FAM134B in Diseases From the Perspectives of Organelle Membrane Morphogenesis and Cellular Homeostasis.” *Journal of Cellular Physiology*. https://doi.org/10.1002/jcp.30377.