

## EXPLORING THE DEVELOPMENT OF NEUROSCIENCE IN THE LIGHT OF ISLAMIC PERSPECTIVES: A QUALITATIVE LITERATURE REVIEW

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**Abstract:** The study aims to investigate the correlation between neuroscience and Islamic principles, addressing the notion that neuroscience is not considered an Islamic discipline due to its emergence after the revelation of the Qur'an and Sunnah in the 7th century. Utilizing a literature review approach, the researcher collected data from scientific online publications and academic sources available on Google Scholar, incorporating both scientific and religious perspectives. The research employs the theory of Prof. Amen Abdullah, which combines the values of science and religion to analyze the data through content analysis techniques. The findings of this research reveal the significant role of the fontanel (Frontal Lobe) located within the human brain, serving as a crucial center for transmitting nerve cell impulses to other sensory organs. This communication is facilitated through neurotransmitters, acting as a crucial communication center between nerve cells. Consequently, the frontal lobe plays a pivotal role in human intelligence and personality, empowering individuals to utilize their minds in enhancing the quality of their thinking. The implications of this research underscore the potential of human beings as intelligent entities, aligning science and religion in the development of Islamic studies and education. Researchers are encouraged to enrich their findings by collaborating with neuroscience experts to ensure a comprehensive interpretation of the Qur'an that resonates with contemporary scientific discoveries.

**Keywords:** *Neuroscience and Islamic Perspective, Brain and Intellect in Islam, Integrating Science and Religion, Amin Abdullah's Theory.*

**Abstrak:** Penelitian bertujuan untuk menyelidiki hubungan antara neurosains dan prinsip-prinsip Islam, dengan mengatasi pandangan bahwa neurosains belum dianggap sebagai disiplin ilmu Islam karena muncul setelah turunnya Al-Qur'an dan As-Sunnah pada abad ke-7. Pendekatan dalam penelitian ini mengacu pada teori Prof. Amin Abdullah yang menggabungkan nilai-nilai sains dan agama untuk menganalisis data melalui teknik analisis konten. Hasil penelitian ini membuktikan bahwa Ubun-ubun (Lobus Frontal) yang terdapat dalam kepala manusia berfungsi sebagai pengantar impuls sel saraf pusat ke alat-alat indra lainnya, menjadikannya bagian paling pokok dalam otak. Komunikasi antar sel saraf ini dipermudah oleh neurotransmitter, yang berperan sebagai pusat komunikasi penting di antara sel saraf. Hal ini berimplikasi pada potensi kehidupan manusia sebagai makhluk berakal, memanfaatkan akalunya untuk meningkatkan kualitas berfikir. Ubun-ubun memiliki pengaruh signifikan terhadap kecerdasan dan kepribadian manusia. Penelitian ini mendorong peneliti untuk selalu memperkaya temuan dengan berkolaborasi bersama ahli neurosains, sehingga tafsir Al-Qur'an dapat dipahami secara komprehensif sesuai dengan penemuan ilmiah kontemporer. Implikasi dari penelitian ini relevan dengan pengembangan studi Islam dan pendidikan Islam, dengan menyelaraskan ilmu sains dan agama dalam konteks masa kini.

**Keyword:** *Neurosains dan Perspektif Islam, Otak dan Akal dalam Islam, Integrasi Sains dan Agama, Teori Amin Abdullah.*

### INTRODUCTION

Until now, neuroscience has predominantly been perceived as a secular science due to its absence of explicit mention in the Qur'an. Consequently, it

remains relatively underdeveloped in the context of Islamic education, as it lacks formal validation from the primary sources of Islamic guidance, namely the Qur'an and Sunnah.<sup>1</sup>

Until now, the research on "the concept of mind and brain in the Qur'an and neuroscience" conducted by Kasno in the study "Aql and the Brain in Neuroscience Studies and Its Implications on Scientific Approaches in Islamic Religious Education," has not reached a definitive conclusion. The research has primarily focused on scientific and neuroscientific aspects, lacking in-depth analysis or specific interpretations of the concepts. As a result, the understanding of "aql" (intellect) and the brain, in a broader sense, remains ambiguous.<sup>2</sup> In his research titled "Brain and Intellect in the Verses of Neuroscience," Fu'ad Arif Noor conducted a similar study, but the findings were not specifically conclusive. The research approach towards examining neuroscience-related verses lacked a focused analysis, and instead, it touched upon only a few verses without comprehensive exploration. Moreover, the analysis and concepts utilized in the research were deemed invalid, leading to limitations in drawing precise conclusions.<sup>3</sup> In contrast to the aforementioned studies, the research titled "The Concept of Mind and Brain in the Qur'an and Neuroscience: Analysis of Nasiyah Concepts in Tafsir Salman" presents a more concentrated investigation into neuroscience from the perspective of Tafsir Salman. This research is relatively novel, and there is a scarcity of similar studies conducted by other researchers. As a result, it becomes imperative to explore and seek comprehensive findings and research outcomes that center on the analysis of this research.<sup>4</sup>

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<sup>1</sup> Suyadi et al., "Academic Reform and Sustainability of Islamic Higher Education in Indonesia," *International Journal of Educational Development* 89 (2022): 102534,

<sup>2</sup> Kasno, "Aql Dan Otak Dalam Kajian Neurosains Dan Implikasinya Pendekatan Saintifik Dalam Pendidikan Islam," *Muaddib: Studi Kependidikan Dan Keislaman* 09, no. 02 (2019): 154–77.

<sup>3</sup> Fu'ad Arif Noor, "Otak Dan Akal Dalam Ayat-Ayat Neurosains," *Manarul Qur'an* 18, no. 1 (2018): 115–40.

<sup>4</sup> Suyadi et al., "Academic Reform and Sustainability of Islamic Higher Education in Indonesia," *International Journal of Educational Development* 89 (2022): 102534,

The researcher argues that previous studies in the field of neuroscience and the brain have predominantly focused on specific aspects or portions of the Qur'an. These studies often involved data-heavy approaches, attempting to quantify the Quranic references related to neuroscience or the brain and intellect. In contrast, Kasno highlighted the correlation between certain Quranic verses and neuroscience, while Fuad and Nor discussed more general aspects of Quranic interpretation. Taufik Pasiak contributed to the theory of neuroscience in medicine, and Suyadi, an expert in neuroscience and Islamic education, specifically examined details in the field of early childhood education.

Given this context, the researcher posits that this current study offers novelty in the realm of similar research. Although it remains a literature review, the research primarily focuses on explicating the significance of the prefrontal cortex concerning neuroscience and the Qur'an. The relevance of this study lies in its correlation with the disciplines of Islamic studies and Islamic education.

The main objective of this study is to explore the relationship between the brain and intellect in the context of neuroscience, integrating perspectives from both science and religion. Science delves into the implications of neuroscience as a discipline that analyzes the human brain and mind. In contrast, religion represents the output of Islamic studies centered on the Qur'an and Sunnah, including interpretations of the Qur'an. The researcher adopts the approach proposed by Prof. Amen Abdullah to examine neuroscience comprehensively. The detailed study of neuroscience aims to unveil the biological basis of human behavior, a crucial task in understanding human behavior through the lens of brain function.<sup>5</sup>

This research is grounded in textual analysis, aiming to establish a meaningful connection between the term "nasyiah" mentioned in Surah Al-Alaq, revealed in the 7th century along with the Qur'an, and its relevance to the term "brain" in neuroscience, which emerged in the 19th century. The study explores the semantic relationship between these two terms to shed light on the potential

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<sup>5</sup>Hamdan Husein Batubara and Asep Supena, "Educational Neuroscience Dalam Pendidikan Dasar," *Jurnal Pendidikan Dasar* 9, no. 2 (2018): h.140–48

correlation between the ancient Quranic text and modern neuroscientific terminology.<sup>6</sup>

It is noteworthy that the field of neuroscience in the context of Islamic religious education is relatively scarce, and this research, driven by Suyadi, stands as a pioneering effort in exploring the intersection of neuroscience and Islamic teachings. Such pioneering endeavors broaden the horizons of knowledge, making this research a subject of continuous interest and potential for further exploration and study.<sup>7</sup>

According to Suyadi, the essence of Islamic education lies in the optimization of all potential abilities, as human potential is fundamentally dependent on the brain.<sup>8</sup> Neuroscience is anticipated to play a vital role in facilitating research concerning the brain and intellect. Through its study, it is evident that the mind and the brain are distinct entities. Etymologically, "Al-'aql" conveys the notion of preventing and forbidding, implying that it pertains to human behavior, wherein individuals exercise self-restraint and restrain their inclinations towards negative actions.<sup>9</sup>

In his essay "Dalil Anfus Al-Qur'an and Embryology," Muhammad Izzuddin Taufiq asserts that verses in the Qur'an concerning the creation of humans highlight the brain as the most enigmatic organ, concealed within the human body. This is due to its role as the intermediary between the spirit and soul, with the concepts of spirit and soul remaining elusive and subject to interpretation.<sup>10</sup>

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<sup>6</sup>Ahmat Miftakul Huda and Suyadi, "Otak Dan Akal Dalam Kajian Al-Quran Dan Neurosains," *Jurnal Pendidikan Islam Indonesia* 5, no. 1 (2020): h. 67–79

<sup>7</sup> Suyadi Astuti Budi Handayani, "Relevansi Konsep Akal Bertingkat Ibnu Sina Dalam Pendidikan Islam Di Era Milenial," *TADIBUNA* 8, no. 2 (2019): h. 222–40

<sup>8</sup> M. Amin Abdullah, "Mendialogkan Nalar Agama Dan Sains Modern Di Tengah Pandemi Covid-19," *Maarif* 15, no. 1 (2020): h. 11–39

<sup>9</sup> Himayatul Izzati, "Potensi Pembelajaran Manusia : Perspektif Neurosains Dan Islam," *JOURNAL OF ALIFBATA: Journal of Basic Education (JBE)* 1, no. 1 (2021): h. 64–77

<sup>10</sup> Muhammad Izzuddin Taufiq, *Dalil Anfus Al-Qur'an Dan Embriologi: (Ayat-Ayat Tentang Penciptaan Manusia)* (Tiga Serangkai, 2006).

This study centers on the examination of the concept of reason and the brain in the Qur'an, adopting a neuroscience approach. It analyzes the notion of "nasiyah" in Salman's interpretation, exploring both its exegetical study and its meaning. This research is intricately tied to the domain of Islamic education, as it delves into the treasures of the Qur'an and Islamic insights.<sup>11</sup>

To obtain novel and reliable research findings, the acquisition of valid data and credible reference sources is imperative. In light of numerous breakthroughs by researchers, particularly in the field of interpretation, there is a growing interest in exploring the nexus between neuroscience and the Qur'an. Both scholars in the field of neuroscience and experts in Islamic studies are engaged in investigating the concept of the mind and brain with a particular focus on the analysis of the "Nasiyah" concept in Salman's interpretation. This research concentration underscores the significance of understanding the mind-brain relationship from both scientific and Quranic perspectives.<sup>12</sup> The diversity of meanings attributed to the concept of reason in the Qur'an and neuroscience adds an intriguing dimension to the data. When adopting a neuroscience approach, terms like "nadhara," "tafakkur," "tadabbur," "afala ta'qilun," and "afala tadzakkarun" hold distinct research implications and interpretations. Exploring these varied lafadz or expressions opens up fascinating avenues of inquiry, shedding light on the intricate relationship between the Qur'anic concepts of reason and the scientific perspectives of neuroscience.<sup>13</sup>

The Qur'an contains numerous verses that refer to the activity of the mind, equating it with brain function. Terms like "tafakkur" (thinking), "taddabur" (contemplating), "tabashshur" (understanding), and others are used to describe this phenomenon. The scientific discipline dedicated to understanding the human brain is known as neuroscience. Presently, the progress in neuroscience has vast

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<sup>11</sup> *Ibid.*

<sup>12</sup> Junita Camelia Kamilah, *Metodologi Penafsiran Kitab Tafsir Salman Tafsir Ilmiah Atas Juz'Amma Karya 26 Pakar ITB* (Surabaya: UIN Sunan Ampel Surabaya, 2019).

<sup>13</sup> Rus'an Rus'an, "Spiritual Quotient (Sq): The Ultimate Intelligence," *Lentera Pendidikan : Jurnal Ilmu Tarbiyah Dan Keguruan* 16, no. 1 (2013): h. 91–100

potential for application across various scientific domains, including Qur'anic exegesis and Islamic studies. Integrating neuroscience into the study of Qur'anic interpretation presents an intriguing avenue of exploration, offering a deeper understanding of the verses and fostering connections between the worlds of Islamic studies and neuroscience.<sup>14</sup>

In this context, Amin Abdullah's writings and studies about the "Integration of Science and Religion" or the "Interconnection of Scientific Sciences and the Concentration of Islamic Studies" are highly relevant. Understanding and implementing these principles in today's society is crucial, especially given the prevalent deviation from Islamic guidelines found in contemporary lifestyles. In the fast-paced modern world, many people prioritize instant gratification and disregard the process of striving towards success. However, it is essential to emphasize the significance of studying the science of the mind and intellect, grounded in the interpretation of the Qur'an, as a guiding framework for human life. By bridging the gap between science and religion, we can achieve a more holistic understanding of human nature and behavior, aligning our actions with Islamic principles for a more purposeful and fulfilling life.<sup>15</sup>

This study will employ qualitative methods in conducting a literature review to analyze research findings. The data sources will primarily consist of scientific journals and books. The insights garnered from this research will be valuable for researchers, as they can further enhance the quality of educational learning in the context of Islam. By delving into the correlation between neuroscience and the Qur'an, this study aims to contribute to a more profound understanding of human cognition and behavior, thereby fostering more effective and meaningful Islamic education practices.<sup>16</sup>

## **METHODS**

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<sup>14</sup> Abdullah, "Mendialogkan Nalar Agama Dan Sains Modern Di Tengah Pandemi Covid-19."

<sup>15</sup> M Amin Abdullah, "THE INTERSUBJECTIVE TYPE OF RELIGIOSITY Theoretical Framework and Methodological Construction for Developing Human Sciences in a Progressive Muslim Perspective," *Al-Jami'ah: Journal of Islamic Studies* 58, no. 1 (2020): h. 63–102

<sup>16</sup> Kusmana, "THE QUR'AN, WOMAN, AND NATIONALISM IN INDONESIA Ulama Perempuan's Moral Movement," *Al-Jami'ah* 57, no. 1 (2019): h. 83–116

This article employs a qualitative approach for its research. The data collection method utilized is library research (Library Study). In the library setting, data is gathered by examining relevant literature, such as articles, books, and documents, along with observing notable works that specifically discuss the concept of Al-Alaq in Salman's interpretation.<sup>17</sup>

The formal object of this study is the exploration of the concept of mind and brain in the Qur'an and neuroscience. The material object under scrutiny is Salman's interpretation, which has been enriched with research findings concerning the concept of "nasiyah."<sup>18</sup>

The data collection technique employed in this study is full sampling, wherein data is sourced from various channels, including national and international journals, reference books, scientific works (theses, and dissertations), as well as online resources from Google Scholar. Documentation instruments are utilized as tools to gather data comprehensively and universally from both primary and secondary data sources.<sup>19</sup>

What sets this research apart and makes it intriguing is its emphasis on exploring meanings. The concept of mind and brain in neuroscience encompasses a wide and evolving spectrum (*mujmal*). In this study, researchers aim to elucidate these meanings by establishing connections with interpretations from the Qur'an. By delving into the nuances of these concepts, the research offers a fresh perspective and sheds light on the intricate relationship between neuroscience and the Qur'anic teachings.<sup>20</sup>

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<sup>17</sup>Suharsimi Arikunto, *Metodologi Penelitian Pendidikan: Teknik Pengumpulan Data Model Moleong*, Bumi Aksara, 2013.

<sup>18</sup> Albi dan Johan Setiawan Anggito, *Metodologi Penelitian Kualitatif* (Sukabumi: CV. Jejak, 2018).

<sup>19</sup>Lexy J. Moleong, *Metodologi Penelitian Kualitatif*, Edisi Revi (Bandung: PT Remaja Rosdakarya, 2014).

<sup>20</sup>Suyadi, Zalik Nuryana, and Anom Wahyu Asmorojati, "The Insertion of Anti-Corruption Education into Islamic Education Learning Based on Neuroscience," *International Journal of Evaluation and Research in Education* 10, no. 4 (2021): h. 1417–25,

## **RESULT AND DISCUSSION**

Based on the problem formulation and the research method used, the findings and explanations presented in this study can be deemed reliable and informative. The researcher has diligently explored the concept of reason and the brain in the Qur'an, adopting a neuroscience approach with a specific focus on the interpretation of *Nasiyah* in Salman's exegesis. The data collection process involved thorough investigation of various sources, including scientific journals, books, and online references. This comprehensive approach has enabled the researcher to illuminate the correlation between neuroscience and Islamic studies, offering valuable insights into human cognition and behavior as depicted in the Qur'an. The study's findings hold the potential to significantly contribute to the comprehension of Islamic education, human conduct, and the interplay between science and religion:

### ***Nasiyah* in Tafsir Salman**

According to Steffens (2015), the term "*nasiyah*" in the Qur'an and Tafsir Salman is defined as the "top crown" or "forelock." The function of the forelock is akin to the "heart" in general interpretations, representing not a single organ but rather a collective group of organs that work together to enable human emotions and sensations. The focus of this interpretation is on the fontanel, which plays a significant role in connecting various organs of the human body.<sup>21</sup> In the interpretation of the verse about *Nasiyah* (fontanel), it is mentioned that while other people can touch our head, they cannot control the thread of death, implying that only Allah knows the appointed time of our death. This highlights the concept of divine supervision (*muroqobah*) in human life, emphasizing that Allah has complete control over our destiny.

Studying the *Nasiyah* verse encourages self-awareness and introspection in life, as it reminds us that our lives are under Allah's watchful gaze. The analogy of

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<sup>21</sup> Niklas K Steffens et al., "'Of the Group' and 'for the Group': How Followership Is Shaped by Leaders' Prototypicality and Group Identification," *European Journal of Social Psychology* 45, no. 2 (2015): h. 180–90,



the identical crown to the rope of death emphasizes the significance of our actions and choices. It is believed that the fontanel is influenced by the character of the individual. If a person's character is virtuous and inclined towards goodness, the fontanel will be associated with intelligence. Conversely, if one's character is inclined towards wrongdoing, the fontanel will be associated with foolishness. Overall, this interpretation emphasizes the importance of leading a righteous life and making virtuous choices, as our actions have consequences that can affect the development of our intellect and character, ultimately shaping our destiny.<sup>22</sup>

### **Between Neorusains and Nasiya verses in *al-alaq* verses 15-16**

In neuroscience, the frontal lobe, often referred to as the "crown" of the brain, is closely associated with cognitive functions. If a human's frontal lobe is damaged and loses its functionality, it can lead to a loss of consciousness, resulting in conditions such as mental instability or frequent forgetfulness, which may be interpreted as signs of insanity or cognitive impairment.<sup>23</sup>

The human mind is closely linked to the fontanel, which is referred to as "Nasiya" in the Qur'an. In the interpretation of the forelock, it is emphasized that the fontanel is not a singular organ of the human body; rather, it plays a specific role in the process of thinking. The fontanel can be likened to the thread of human life, and if it experiences damage, it may lead to a loss of direction, consciousness, and eventually, death. As it is also connected to the heart, any impairment can result in the heart ceasing to beat. The Nasiya verse, along with other verses in the Qur'an, highlights God's immense power and deep knowledge bestowed upon humans, thereby encouraging piety and reverence towards Allah.<sup>24</sup>

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<sup>22</sup> Stephan E. Vogel, Celia Goffin, and Daniel Ansari, "Developmental Specialization of the Left Parietal Cortex for the Semantic Representation of Arabic Numerals: An FMR-Adaptation Study," *Developmental Cognitive Neuroscience* 12, no. 1 (2015): h. 61–73

<sup>23</sup> Suci Nurpratiwi, Muhamad Ridwan Effendi, and Amaliyah Amaliyah, "Improving Religious Literacy Through Islamic Religious Education Course Based On The Flipped Classroom," *Istawa : Jurnal Pendidikan Islam* 6, no. 1 (2021): h. 16

<sup>24</sup> Aprilia Dewi Ardiyanti, "Perspektif Al- Qur ' an Tentang Sel Saraf Dalam Kajian Integrasi Agama Dan Sains," in *Sains Studi Alqur'an*, vol. 2, 2020, h. 61–63.

In Surah Al-Alaq 15-16, the term "Nasiya" is interpreted as the forelock. If a person uses their thoughts to engage in forbidden actions and disobey Allah, they risk facing the consequences in Hell. Scholars have various interpretations, with some suggesting that sinners will be pulled by the forelock, while others say that angels will suddenly pull it out. For instance, when our minds entertain negative thoughts such as lust, laziness, or reluctance to pray, it brings us closer to committing negative actions and sins against Allah SWT. It serves as a reminder of the importance of guarding our thoughts and striving to align them with righteousness and obedience to Allah's commands.<sup>25</sup> Rosidin categorizes the most crucial points concerning the concept of the fontanel in Salman's interpretation at ITB as follows.

- a. The crown corresponds to the forebrain, specifically the frontal lobe, which serves as the center of consciousness, influencing both positive and negative behaviors. It functions as the decision-maker and plays a significant role in controlling emotions and maintaining long-term memory.
- b. The area of the brain just below the crown is part of the control system or nervous system.
- c. Damage to the frontal lobe leads to wide-ranging effects, including personality changes and a high likelihood of sexual aberrations.
- d. The term "forehead" can also be interpreted as a "death rope" with an uncertain location, possibly symbolizing the enigmatic nature of human mortality.

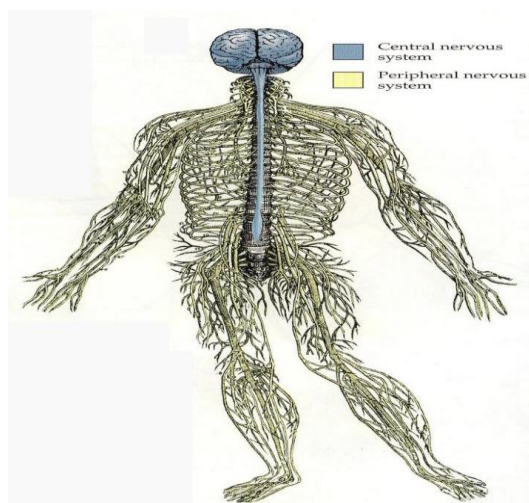
### **The Brain and Neorusains in Salman's Interpretation**

According to Iip Farliha, the function of the nervous system is to monitor, integrate, and respond to all information from the various organs of the human body. During the process of information integration, sensory interpretation takes

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<sup>25</sup> Muji and Dosen STIT Hidayatullah, "Fundamental Taksonomi Bloom Dalam Sistem Pendidikan Menurut QS Al-'Alaq Ayat 1-5 (Telaah Tafsir Ibnu Katsir, Al-Qurthubi, Dan Salman)," n.d.

place in humans, closely influencing the direction and decisions to be made. This can lead to feelings of skepticism or hesitation when uncertainty arises.<sup>26</sup>



**Figure 1.** The brain and its correlation with other organs of the body

Anatomically, the nervous system comprises the central nervous system and the peripheral system. The central nervous system encompasses the brain and spinal cord, while the peripheral nerves have two main tasks. Firstly, sensory nerves carry impulses to the central nervous system, and secondly, motor nerves carry impulses from the central nervous system to the various senses of the human body.<sup>27</sup>

The fontanel is also interpreted as the Frontal Lobe, which is a fundamental section of the brain. It is traversed by neurotransmitters, serving as the communication center between nerve cells, facilitating the exchange of signals between them.<sup>28</sup> According to MZ (2020), as explained in Salman's interpretation, damage to the frontal lobe can lead to impairment in human personality. In a

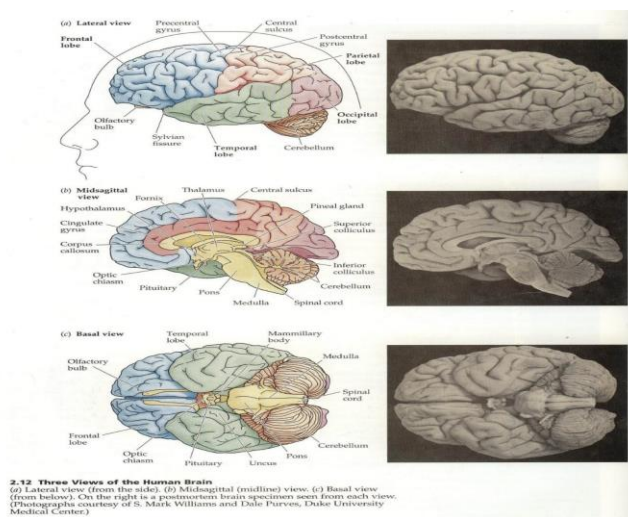
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<sup>26</sup> Iip Farliha, "Tafsir Salman ITB. Bandung," in *TAFSIR SALMAN ITB* (Bandung: itb, 2019), 2010.

<sup>27</sup> Nurhadi Ibrahim Herliani Dwi Putri Halim, "Efek Neuroprotektif Ekstrak Akar *Acalypha Indica* 500 Mg/KgBB Terhadap Perubahan Inti Sel Saraf Hipokampus Pascahipoksia Serebri," *Efek Neuroprotektif* 1 (2013).

<sup>28</sup> Tyler Davis et al., "Neural Correlates of Attitudes and Risk Perception for Food Technology Topics," *Food Quality and Preference* 80, no. 45 (2020): 103836

broader sense, if the left brain is damaged, it may result in prolonged stress and sadness, akin to pseudo depression. Conversely, if the damage occurs in the right brain, it can lead to mental and emotional disorders, resembling symptoms of mental illness, known as pseudopsychopathic.<sup>29</sup>



**Figure 2. Human Frontal Lobe**

Just as an example of deviant sexual behavior, damage to the Frontal Lobe can also be a contributing factor. It may lead to a decrease in human interest in sex because it affects normal sexual behavior, resulting in abnormal sexual tendencies.<sup>30</sup>

#### 1. The Meaning of Nasiyah (Forehead) from the Perspective of Mufassirs.

The term "*nasfa*" denotes holding, while "*nasiyah*" refers to the head or crown. According to the interpretation of Surah Al-Alaq, verses 15-16, the phrase "the crown is lying and disobedient" is defined as "*mudhaf*" and "*mudhaf ilaih*," highlighting its significance as a trait closely related to human nature and personality. This implies that one's attitude, whether good or bad, is inherently

<sup>29</sup> Rafika Dwi Rahmah MZ, "Pengembangan Materi Allah Pencipta Alam Semesta Pada Pembelajaran PAI Dengan Eksperimen Sains Di SD Muhammadiyah Bayen," *AL-MURABBI: Jurnal Studi Kependidikan Dan Keislaman* 6, no. 2 (2020)

<sup>30</sup> Waharjani Waharjani, "CHILDREN'S FAITH EDUCATION IN AN INTERFAITH MARRIAGE FAMILY (A Case Study of Moslem and Catholic Couples in the Special Region of Yogyakarta)," in *INTERNATIONAL SEMINAR ON EDUCATION*, 2020, h. 679-91.

tied to their crown, symbolizing the decisions and actions they make throughout life.<sup>31</sup>

According to Prof. Keith L. Moore's argument in scientific miracles of the Qur'an, he states that information about the brain and its functions has been explained throughout history, but it was not found in health and medical books except in the Qur'an, which already existed during the time of Prophet Muhammad (peace be upon him). Muhammad's (PBUH) teachings included knowledge about the frontal lobe, which is closely related to the human brain.<sup>32</sup>

In the discovery of frontal lobe research in 1842, it was observed that an American worker was stabbed with a stick in the forelock, which had a significant impact on his behavior, leading to a loss of consciousness and a change in his personality. It is noteworthy that Neuroscience (Neorusain) existed in scientific civilization along with the wealth of Qur'anic knowledge. As explained by the mufassir, in the results of research on the frontal lobe, many Muslim scholars had already conducted research on the brain and its functions in the context of understanding Islamic education during the 7th century.<sup>33</sup>

### **The fontanel in the point of view of the function of thinking.**

Nasiyah, which functions similarly to the brain, is an organ located at the highest part of the human body, inside the human head. This positioning signifies the nobility of humans compared to other creatures of Allah, as the brain is not

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<sup>31</sup> Imam Sutomo and Budihardjo, "The Rejection of Religious Nationalism towards the Secular State and the Islamic Caliphate: Indonesian Religious Figures Perspective," *Indonesian Journal of Islam and Muslim Societies* 11, no. 1 (2021): h. 115–37

<sup>32</sup> Jack Smothers et al., "From the Follower's Viewpoint: A Configurational Approach to the Ideal Academic Leader," *Journal of Leadership and Organizational Studies* 18, no. 3 (2011): h. 293–307

<sup>33</sup> Najamuddin Petta Solong, Munirah Munirah, and Muh. Arif, "Effective School Management At Man Insan Cendekia Gorontalo," *Lentera Pendidikan : Jurnal Ilmu Tarbiyah Dan Keguruan* 23, no. 1 (2020): h. 22

placed near the organs involved in excretion, unlike animals, whose brain is in close proximity to such organs.<sup>34</sup>

The term "*nasiyah*" is also interpreted as "reason" by many, and in terms of language morphology, it appears 49 times in the Qur'an. The Qur'an emphasizes that intelligent individuals are those who effectively utilize their thoughts and emotions to make sound decisions and judgments.<sup>35</sup>

According to Quraish Shihab, directing oneself to avoid sins and mistakes requires the use of one's intellect. This implies that every action must be based on one's reasoning and character.<sup>36</sup>

Meanwhile, the term "aql" in the Qur'an is mentioned in various forms and verb pronunciations, totaling 49 occurrences. Implicitly, the Qur'an places great emphasis on the importance of intellect and its application in life, particularly in seeking the truth. Below is a discussion of 'aql and several verses that mention it, which require further analysis and interpretation.

According to Al-Raghib Al-Isfahani in his book "*Mufradat Alfadz al-Qur'an*," 'aql is so named because of its strong potential to acquire knowledge. It is the inherent power in humans that allows them to comprehend and receive knowledge. Thus, 'aql becomes the primary tool for humans to gain knowledge, and through this knowledge, they can benefit by applying what they have learned or embarking on new endeavors.<sup>37</sup>

Abdullah Yusuf Ali interprets the phrase "*la ya'qilun shay' wa la yahtadun*" as a lack of wisdom and guidance. He also emphasizes that "*ta'qqul*" activity represents wisdom, which philosophically denotes the ability to

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<sup>34</sup> Suyadi, "Hybridization of Islamic Education and Neuroscience: Transdisciplinary Studies of 'Aql in the Quran and the Brain in Neuroscience," *Dinamika Ilmu* 19, no. 2 (2019): h. 237–49

<sup>35</sup> Taufiq Pasiak, *Unlimited Potency of the Brain, Kenali Dan Manfaatkan Sepenuhnya Potensi Otak Anda Yang Tak Terbatas* (Bandung: Mizan, 2009).

<sup>36</sup> Faisal Haitomi, "Menimbang Hermeneutika Sebagai Mitra Tafsir," *NUN: Jurnal Studi Alqur'an Dan Tafsir Di Nusantara* 5, no. 2 (2019): 45–69.

<sup>37</sup> Muhammad Iqbal, Universitas Islam, and Negeri Antasari, "NUANSA FIQIH DALAM PEMIKIRAN TEOLOGI SYEKH MUHAMMAD ARSYAD AL-BANJARI PADA RISALAH TUHFAT AL-RÂGHIBÎN," *Khazanah: Jurnal Studi Islam Dan Humaniora* 19, no. 1 (2021): h. 21–38

comprehend broadly, deeply, and in detail and to perceive it from various perspectives to foster commitment and consistency between what is read, understood, and implemented in actions.<sup>38</sup>

### **Scientific Interpretation of the Qur'an and Its Urgency According to Zaghul Al-Najjar**

Science encompasses knowledge about various aspects of the universe, such as chemistry, astronomy, engineering, biology, mathematics, social economics, geology, and more. On the other hand, scientific interpretation, also known as scientific exegesis, holds multiple definitions among scholars. One of these definitions, as conveyed by al-Dhahabi, describes it as a process where several scientific terms are applied to the Quranic texts to express various kinds of knowledge, including non-scientific aspects, and philosophical ideas contained therein.<sup>39</sup>

The second definition, proposed by Amin al-Khuli, views scientific interpretation as an approach that applies contemporary scientific terms to the Quranic text and aims to draw various knowledge and philosophical perspectives from it. Both definitions may give the impression of attempting to impose modern scientific terms onto the Quranic verses or subjugating the Quranic text to scientific theories. However, supporters of scientific interpretation argue that this is not the intention of interpreting with a scientific approach and the misinterpretation should be clarified. Al-Khuli himself is known to be part of a group of scholars who oppose scientific interpretations. He believes that the Quran is a book of guidance containing religious and moral messages, which should not be forced to always align with scientific discoveries in fields like physics, biology, etc., as these are relative and subject to change over time.<sup>40</sup>

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<sup>38</sup> Izzati, "Potensi Pembelajaran Manusia : Perspektif Neurosains Dan Islam."

<sup>39</sup> Muhibudin, *Sejarah Singkat Perkembangan Tafsir Al-Qur'an*, Pertama (Universitas Islam As-Syafiiyah, 2020).

<sup>40</sup> Intan Pratiwi Mustikasari, "Urgensi Penafsiran Saintifik Al-Qur'an: Tinjauan Atas Pemikiran Zaghul Raghil Muhammad Al-Najjar," *Studia Quranika* 6, no. 1 (2021)

Zaghlul al-Najjar, as a mufassir, adopts a scientific approach that is fortified by his expertise in scientific discoveries related to the universe, the creation of living beings, and health. His aim is to ground the Quran and demonstrate its scientific miracles in modern society. While he values the classical tradition of interpretation, he also incorporates modern scientific facts when discussing the Kauniyah verses to validate the truth of the Quran as a sacred scripture that transcends time. It is important to note that in his Tafsir, Zaghlul maintains awareness of the limitations of scientific interpretation and does not interpret the entire Quran, but focuses on the Kauniyah verses, presenting evidence from scientific discoveries that align with current scientific advancements to substantiate the authenticity of the Quran from multiple perspectives.<sup>41</sup>

In addition to the fact that the Quran does not entirely consist of verses containing scientific indications, the selection of verses for scientific interpretation is based on the mufassir's main expertise, which includes knowledge of the universe, the creation of living beings, and health. The classical interpretation he presents follows the arrangement of the verses in the Quranic Mushaf, starting from al-Baqarah to al-Nas, while also adhering to the rules of the Arabic language in its interpretation.<sup>42</sup>

The presence of scientific interpretation of the Quran facilitates da'wah in the modern era, as science plays an integral role in contemporary life and influences people to think more rationally. Modern society relies on reason to accept various concepts, and scientific theories, acknowledged for their truth, help in understanding and learning the Quran more easily. Allah encourages contemplation of His creation in the universe as a sign of His power, which aligns with the scientific approach in interpreting the Quran. For Quran scholars, this

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<sup>41</sup> Farhatul Muthi'ah, "Telaah Penafsiran Zaghlul Al-Najjar Tentang Laut Yang Mendidih Dalam Kitab Tafsir Al-Ayat Al-Kauniyyah Fi Al-Qur'an Al-Karim (Kajian Tafsir Tematik Dan Sains)," *Skripsi*, 2019.

<sup>42</sup> Mustikasari, "Urgensi Penafsiran Saintifik Al-Qur'an: Tinjauan Atas Pemikiran Zaghlul Raghil Muhammad Al-Najjar."



method serves as a safeguard against mistakes when mentioning information about natural phenomena in the Quran. Although the scientific approach may not lead to absolute truth, it offers relative truth, fostering opportunities for innovations and complementing previous interpretations and research studies.<sup>43</sup>

According to Zaghul al-Najjar, the urgency of scientific interpretation of the Quran lies in the need to understand the secrets and deeper meanings behind the Kauniyah verses. The Quran contains sacred verses with scientific implications that were not fully understood by the people of its time. Thus, a comprehensive study of scientific cues in the Quran, involving contributions from scientists and experts from various fields, is essential for effective preaching and proving the absolute truth of the Quran in modern society. The discussions should be interesting and easy to understand.

However, the mufassir must be cautious about the limitations of the scientific approach in interpretation to avoid making unwanted mistakes, as exemplified by Zaghul al-Najjar. Subjectivity plays a significant role in interpretation, so the mufassir should always base their interpretations on the Quran and equip themselves with knowledge that aligns with their chosen approach. The ultimate goal remains to uphold the Quran as the foundation of interpretation while utilizing relevant knowledge to better understand its verses.<sup>44</sup>

Zaghul al-Najjar, also known as Zaghul Radhib Muhammad al-Najjar, was a scholar, preacher, and scientist who dedicated his efforts to the study of I'jaz al-'Ilmi (scientific miracles) in the Quran. He was born on November 17, 1933, in Masyal, Egypt, and was raised in a devout family that instilled religious and moral values in his upbringing. This is evident from his remarkable achievement of memorizing 30 chapters of the Quran at the young age of 10. His passion for science and technology led him to pursue higher education, and he obtained a

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<sup>43</sup> M. Syahrudin Amin, "Perbedaan Struktur Otak Dan Perilaku Belajar Antara Pria Dan Wanita; Eksplanasi Dalam Sudut Pandang Neuro Sains Dan Filsafat," *Jurnal Filsafat Indonesia* 1, no. 1 (2018): h. 38

<sup>44</sup> Nurkhamimi Zainuddin et al., "Development of Arabic Language Lifelong Learning (A3L) Tutorial Platform Using WhatsApp Mobile Application," *Creative Education* 11, no. 04 (2020): h. 452–67

certificate of eligibility in the field of Arabic in 1951. However, his curiosity and interest in various scientific fields prompted him to continue his academic journey at a university.<sup>45</sup>

### **Fontanel in Islamic Education Approach**

According to Suyadi, the distinction between the crown (intellect) and reason (heart) in education remains unresolved to this day. For instance, individuals proficient in solving mathematical problems may not necessarily excel in resolving social issues. Conversely, children with high scores in mathematics may not necessarily be proficient in mastering the realm of music.<sup>46</sup>

Suyadi also provided an example of the Islamic educational direction, where it is not advisable to overly prioritize the development of intellectual capabilities in Islam. Instead, the emphasis is placed on nurturing noble character and moral virtues (akhhlakul karimah). Islamic education is encouraged to adopt a heart-centered approach in instilling and manifesting good behavior and personality traits.<sup>47</sup>

From the above explanation, it can be inferred that the frontal lobe (crown) is essential as the primary basis for thinking, and when in harmony with the heart, it results in positive thoughts and feelings, leading to a good personality. This is exemplified by Prophet Muhammad (peace be upon him), who was sent by Allah to perfect human character, emphasizing the importance of nurturing both intellectual and moral aspects for a balanced and virtuous personality.<sup>48</sup>

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<sup>45</sup> Mustikasari, "Urgensi Penafsiran Saintifik Al-Qur'an: Tinjauan Atas Pemikiran Zaghul Raghil Muhammad Al-Najjar."

<sup>46</sup> Suyadi, Zalik Nuryana, and Niki Alma Febriana Fauzi, "The Fiqh of Disaster: The Mitigation of Covid-19 in the Perspective of Islamic Education-Neuroscience," *International Journal of Disaster Risk Reduction* 51, no. 2 (2020): h. 1–15

<sup>47</sup> Suyadi, Zalik Nuryana, and Sutrisno Sutrisno, "The Religion in Higher Education Curriculum Referring to Indonesian Qualification Framework: The Inclusion of Neuroscience and Anti-Corruption Education," *International Journal of Education and Learning* 3, no. 1 (2021): h. 38–44

<sup>48</sup> Saibah and Suyadi, "Constructivism Of Neurosains-Based in Building The Qur'ani Character Of SMP Muhammadiyah 1 Sleman Students," *Edukasi* 8, no. 1 (2020): h. 85–95

According to Suyadi, the discussion of neuroscience in learning cannot be solely explained by brain structure (neuroanatomy) and brain function (neurophysiology). He highlights that the brain can be divided into different parts, including the cerebrum, cerebellum, brainstem, and limbic system. The cerebrum is associated with learning processes, while the cerebellum is responsible for coordination and balance. The brainstem plays a crucial role in regulating essential functions like heart rate and breathing, vital for sustaining life. On the other hand, the limbic system is primarily concerned with regulating emotions and processing emotional memories. Understanding these brain divisions can offer valuable insights into the complexities of learning processes.<sup>49</sup>

Physically, the brain (neuroanatomy) is divided into two parts, the right and left hemispheres. However, the difference between the two physical hemispheres is not as significant as the difference in their functions (neurophysiology). While both hemispheres are responsible for controlling movement and sensation, the control is divided in a crosswise manner. For instance, the left brain controls the left side of the body.

Traditionally, it was assumed that the two hemispheres of the brain have different specializations. For example, it was believed that the right brain is responsible for processing melodies. However, the latest scientific evidence contradicts this assumption. It has been found that left-handed people can understand melodies (which should be processed by the right brain) but are processed properly through the body's organs, especially the right ear. In other words, left-handed people process music using their left brain. Similarly, subsequent research has shown that right-handed people, or individuals in general, also use the left ear to process music. This finding challenges the previous debate about the specialization of brain function between the right and left hemispheres.<sup>50</sup>

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<sup>49</sup> Suyadi et al., "Academic Reform and Sustainability of Islamic Higher Education in Indonesia," 2022.

<sup>50</sup> Mohammad Jailani, Jannatul Husna, and Nur Kholis, "Membedah Hermeneutika Perspektif Ilmuan Muslim Modern: Korelasinya Dalam Studi Ilmu Hadits," *AL QUDS: Jurnal Studi Alquran Dan Hadis* 6, no. 1

In Islam, the most significant human faculty is the faculty of reason. This is what sets humans apart from other creatures. The Qur'an actively encourages the use of reason to ponder upon the signs of God's greatness present within oneself and in the universe. Furthermore, the Qur'an urges humans to reflect upon the creation of the heavens and the earth and to draw lessons from the experiences of past communities. Those who reject these divine directives and fail to contemplate the verses of the Qur'an are described by Allah SWT as being deaf, dumb, and blind, as they do not engage in critical thinking about what they hear and see, as mentioned in Surah Al-Baqarah (2:18).<sup>51</sup>

Indeed, it is fitting to assert that the objective of Islamic education is the holistic development of individuals. In Islamic education, the intellect is nurtured through honesty, critical thinking, and hands-on experience, leading to a deep understanding of the Supreme Creator by seeking divine guidance and restraining impulsive desires. By doing so, individuals will readily attain knowledge based on sound reasoning, avoiding any biases or preconceived notions.<sup>52</sup>

Reason is undeniably one of the most crucial aspects of human beings. It serves as a tool for thinking and, though intangible, constitutes the essence of humanity. Through reason, humans ascend to a higher level of perfection compared to other creatures. The association of reason with the brain is evident as the brain receives stimuli from the senses, leading to emotions and intentions. Nevertheless, the brain possesses limitations, while the mind surpasses these boundaries and operates based on its inherent potential and strength. Unlike

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<sup>51</sup> Suyadi, Nuryana, and Sutrisno, "The Religion in Higher Education Curriculum Referring to Indonesian Qualification Framework: The Inclusion of Neuroscience and Anti-Corruption Education."

<sup>52</sup> Mohammad Jailani, Suyadi, and Kusmana, "Teachers and Students Relation from Ibnu Sina 's Multilevel Reasoning and Neuroscience Perspective : Implications for Islamic Education Development," *Jii Indo-Islamika Jurnal Kajian Interdisipliner Islam Indonesia* 11, no. 2 (2021): h. 65–80.

sensory stimulation, the mind can acquire knowledge that delves deeper and extends beyond physical limitations.<sup>53</sup>

## CONCLUSION

The study of Neuroscience in the 19th century was already expansive and present in Islamic civilization since the revelation of the Qur'an in the 7th century during the time of Prophet Muhammad. Renowned scientist Prof. Keith L. Moore revealed in his research findings that the frontal lobe (Toenail) was identified in 1842 when an American worker was stabbed in the forelock, leading to a change in behavior, loss of consciousness, and a decline in good personality.

In this research, the focus lies on the frontal lobe (*nasiyah*) in Salman's interpretation, denoting the forelock. It is interpreted that when the frontal lobe is employed for good deeds, it fosters health and intelligence, whereas engaging in evil deeds causes damage, leading to deficiencies, stupidity, and a loss of personality. Some scientists interpret the loss of desire as a result. The forelock is also symbolically seen as a tether of human life, as only Allah knows when it will be taken, signifying the Almighty's power. Humans, being inherently forgetful and prone to ignorance, are susceptible to making mistakes and committing sins due to their inherent weakness, as explained in the Qur'an.

The researcher encourages fellow academics and scientists to further delve into this research, examining the data and findings presented. Focusing on the study of verses related to Neuroscience in Salman's interpretation would be beneficial. There is still much to explore concerning the Qur'an, not only in the context of *nasiyah* verses in Surah Al-Alaq but potentially in other Surahs as well. Linguistic studies and interpretations may also offer valuable insights for future research.

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