



## The Impact of Fasting on Student's Academic Performance

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**Abstract.** *This research explores the impact of Ramadan fasting on student's academic performance and identifies socio-cultural factors and interventions that can mitigate any negative effects. The study investigates three research questions: (1) the impact of fasting on children's cognitive abilities and academic performance, (2) socio-cultural factors influencing the relationship between fasting and academic achievement, and (3) specific strategies or interventions to support fasting children's academic success during Ramadan. A literature review was conducted to examine previous research on the topic, incorporating studies that explored the physiological, psychological, and socio-cultural dimensions of Ramadan fasting among children. The findings highlight the complex relationship between fasting and academic performance, with studies reporting varying effects ranging from negative to neutral or even positive. Socio-cultural factors such as family support, cultural attitudes towards education, dietary habits, school policies, and socio-economic status were identified as influential factors shaping children's experiences during fasting and their academic outcomes. Additionally, several strategies and interventions were identified to mitigate the negative effects of fasting on academic performance, including nutritional guidance, hydration strategies, flexible school policies, supportive school cultures, family involvement, peer support networks, time management skills, emotional well-being support, physical activity opportunities, and continued academic support. These findings underscore the importance of holistic approaches to support fasting children's academic success during Ramadan, addressing their physical, emotional, social, and academic needs.*

**Keywords** Ramadan fasting, student, cognitive, academic performance, socio-cultural factors.

**Abstrak.** Penelitian ini mengeksplorasi dampak puasa Ramadan terhadap kinerja akademik siswa dan mengidentifikasi faktor-faktor sosial-budaya serta intervensi yang dapat mengurangi efek negatifnya. Studi ini menyelidiki tiga pertanyaan yang melingkupi: (1) dampak puasa terhadap kemampuan kognitif dan kinerja akademik siswa, (2) faktor-faktor sosial-budaya yang memengaruhi hubungan antara puasa dan prestasi akademik, dan (3) strategi atau intervensi khusus untuk mendukung kesuksesan akademik siswa yang berpuasa selama bulan suci Ramadan. Tinjauan literatur dilakukan untuk meneliti kajian-kajian sebelumnya tentang topik tersebut, yang mencakup studi-studi yang mengeksplorasi dimensi fisiologis, psikologis, dan sosial-budaya dari puasa Ramadan pada siswa. Temuan menyoroti hubungan kompleks antara puasa dan kinerja akademik, dengan studi-studi yang melaporkan efek yang bervariasi mulai dari negatif hingga netral atau bahkan positif. Faktor-faktor sosial-budaya seperti dukungan keluarga, sikap budaya terhadap pendidikan, kebiasaan makan, kebijakan sekolah, dan status sosial-ekonomi diidentifikasi sebagai faktor-faktor yang memengaruhi bentuk pengalaman siswa selama berpuasa dan hasil akademik mereka. Selain itu, beberapa strategi dan intervensi diidentifikasi untuk mengurangi efek negatif puasa terhadap kinerja akademik, termasuk panduan nutrisi, strategi hidrasi, kebijakan sekolah yang fleksibel, budaya sekolah yang mendukung, keterlibatan keluarga, jaringan dukungan sebaya, keterampilan manajemen waktu, dukungan kesejahteraan emosional, peluang aktivitas fisik, dan dukungan akademik berkelanjutan. Temuan ini menegaskan pentingnya pendekatan holistik untuk mendukung kesuksesan akademik siswa yang berpuasa selama Ramadan, yang mencakup kebutuhan fisik, emosional, sosial, dan akademik mereka.

**Kata kunci:** puasa Ramadan, siswa, kognitif, kinerja akademik, faktor sosial-budaya.

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## **INTRODUCTION**

In recent years, there has been a growing interest in understanding the impact of religious practices on various aspects of human life, including education. Ramadan, the ninth month of the Islamic lunar calendar, is marked by fasting from dawn until sunset, with abstinence from food, drink, and other physical needs. While fasting during Ramadan is obligatory for adult Muslims, children often participate to varying degrees, influenced by cultural and familial practices. This raises questions about how fasting during Ramadan might affect children's academic performance, given the potential physiological and psychological effects of fasting on cognitive function and learning. Previous research has provided some insights into the relationship between fasting and academic performance, albeit with mixed findings. For example, a study by Cherif et al. (2016) found that fasting during daylight hours was associated with decreased cognitive function, certain aspects, like coping mechanisms and the ability to make decisions. It is potentially impacting the academic achievement. Meanwhile, Farooq et al., (2015) stated that only preteens showed decreases in attention. However, other studies have suggested that Ramadan fasting did not impact the academic achievements or general welfare of children and adolescents (Miladi et al., 2024). Another study has mentioned that fasting might have minimal or positive effects on self-discipline and it serves as an effective method for disrupting the habit (Ahmad et al., 2012). Heckman and Rubinstein (2001) stated that dedicated religious activities may influence non-cognitive skills, which play a significant role in determining educational achievements (Heckman and Rubinstein, 2001). These conflicting findings underscore the need for further investigation into the nuanced relationship between Ramadan fasting and children's academic performance.

The impact of fasting during Ramadan on children's academic performance is undoubtedly multifaceted, influenced by various socio-cultural factors. The family support is crucial during Ramadan, affecting children's ability to cope with fasting while maintaining academic commitments. Close supervision of children fasting throughout the month is crucial (Mohamed et al., 2019). Moreover, this month's dietary habits and sleep patterns can significantly impact children's cognitive function and overall energy levels, potentially affecting their academic performance. For example, irregular meal times and disrupted sleep schedules may lead to decreased attentiveness and concentration in the classroom, ultimately affecting learning outcomes. According to Farooq et al. (2015) the fasting observed during Ramadan led to notable alterations in body composition, dietary consumption, and sleeping routines. He stated that the possible adverse effects of fasting during Ramadan on body composition, physical activity, sleep, and cognitive function could influence children's capacity to effectively participate in active learning within the school environment. In adult students, fasting impacts the academic performance of college students by inducing headaches, fatigue, and disruptions to their sleep schedule. However, the majority of participants noted that fasting negatively affects their concentration and exam performance during study sessions more than it positively impacts them (Abukanna, 2022).

Furthermore, the educational context, including school policies and family support systems, may also shape the relationship between fasting during Ramadan and academic performance. Schools provide accommodations for fasting students, such as adjusted schedules, and this mitigate the negative effects of fasting on learning. Another studies show that during Ramadan, changes in time allocation may occur, affecting studying routines (Hornung et al., 2023). According this study, the reduced availability of alternative activities during this period could decrease the cost of studying, potentially improving academic performance. Moreover,

parents may find more time to interact with their children and assist them with their learning, taking advantage of the heightened religious observance during Ramadan. Conversely, schools with rigid policies or insufficient support for fasting students may exacerbate their challenges during this period, potentially impacting their academic success. Therefore, while fasting during Ramadan can challenge children's academic performance, various socio-cultural factors and the support structures within the educational environment likely influence the extent of its impact. Understanding these socio-cultural factors is crucial for designing effective interventions to support children's academic success during Ramadan. Furthermore, exploring potential strategies or interventions to mitigate any negative effects of fasting on academic performance is essential for promoting educational equity and well-being among children from diverse cultural backgrounds. By addressing these research gaps, this study aims to understand better the complex interplay between religious practices, such as Ramadan fasting, and children's academic achievement.

While fasting during Ramadan is a deeply ingrained cultural and religious practice for many families, its implications for children's academic performance still need to be explored. This study seeks to fill this gap by investigating the impact of Ramadan fasting on children's cognitive abilities and academic achievement, considering socio-cultural factors and potential interventions. Through rigorous empirical research, we aim to provide valuable insights that can inform educational policies and practices, ultimately promoting children's academic success and well-being during Ramadan.

## **METHODS**

For this library research (Arifin, 2020), a systematic data collection and analysis approach is employed to gather relevant literature on Ramadan fasting and its impact on children's academic performance. The primary data sources will include academic journals, books, conference proceedings, and reputable online databases such as PubMed, PsycINFO, and Google Scholar. Keywords related to Ramadan fasting, children, academic performance, cognitive function, and socio-cultural factors is used to conduct comprehensive searches. The data collection process involve identifying and reviewing scholarly articles and other relevant publications that discuss the relationship between Ramadan fasting and children's academic performance. Key information, such as study objectives, methodologies, findings, and limitations, will be extracted and synthesized to gain insights into the current knowledge on the topic. Additionally, references cited within the selected articles are examined to identify additional sources that may contribute to the research. To analyze the collected data, a thematic analysis approach is employed to identify recurring themes, patterns, and discrepancies across the literature. This process involve organizing the extracted information into thematic categories related to the impact of Ramadan fasting on children's cognitive abilities, academic achievement, and socio-cultural factors influencing this relationship. By systematically analyzing the data, this research aims to identify gaps, contradictions, and areas for further investigation within the existing literature. Furthermore, critical appraisal and synthesis of the findings is conducted to develop a coherent narrative that addresses the research questions and objectives. The synthesized findings are interpreted using existing theoretical frameworks and empirical evidence to draw meaningful conclusions and implications for future research and practice. Overall, this research method provides a comprehensive overview of the current understanding of Ramadan fasting and its implications for children's academic performance while highlighting avenues for future inquiry and intervention.

## **RESULT AND DISCUSSION**

### **Fasting and Ramadan**

Ramadan, also spelt Ramadhan, is the ninth month of the Islamic lunar calendar and considered one of Islam's holiest months (Beshyah, 2019). It is a time of fasting, prayer, reflection, and community for Muslims worldwide. The timing of Ramadan is based on the sighting of the moon, and its duration lasts for 29 or 30 days, depending on the lunar calendar. The beginning and end of Ramadan are marked by the sighting of the crescent moon, which signifies the start of the fasting period and the celebration of Eid al-Fitr, respectively. During Ramadan, Muslims observe fasting from dawn (Fajr) until sunset (Maghrib) (Ashraf, 2013; Firmansyah, 2015), abstaining from food, drink, smoking, and other physical needs. The pre-dawn meal before fasting begins is called Suhoor, while the meal to break the fast at sunset is known as Iftar. Fasting is considered one of the Five Pillars of Islam, which are the fundamental acts of worship and practices that all Muslims are expected to uphold. It fosters self-discipline, spiritual growth, empathy for the less fortunate, and a deeper connection with Allah (God).

In addition to fasting, Ramadan is a time for increased devotion to prayer, recitation of the Quran (the holy book of Islam), and acts of charity (Zakat). Muslims are encouraged to engage in additional prayers, such as Taraweeh, performed after the nightly Isha prayer during Ramadan (Jones, 2022). The Quran, which Muslims believe to be the word of Allah as revealed to the Prophet Muhammad, is recited extensively during Ramadan to complete its recitation by the end of the month. Ramadan is also a time for reflection, self-examination, and spiritual purification. Muslims strive to engage in acts of kindness, forgiveness, and self-improvement to strengthen their faith and draw closer to Allah. It is believed that during Ramadan, the gates of heaven are open, and the gates of hell are closed, with Satan chained up, allowing Muslims to focus on their spiritual journey without the distractions of evil influences. Community plays a significant role during Ramadan, with Muslims coming together for prayers, Iftar meals, and communal activities. Mosques often host nightly Taraweeh prayers, Quran recitation sessions, and community Iftar gatherings, fostering a sense of unity and camaraderie among believers. Families and friends also gather to share meals and support one another in fasting and worship, strengthening social bonds and reinforcing the values of compassion, generosity, and solidarity. At the end of Ramadan, Muslims celebrate Eid al-Fitr, or the Festival of Breaking the Fast, which marks the culmination of the month-long fasting period. It is a joyous occasion characterized by special prayers, feasting, gift-giving, and acts of charity. Eid al-Fitr is a time of gratitude, celebration, and renewal as Muslims express their appreciation for the blessings of Ramadan and seek forgiveness for any shortcomings during the month.

Ramadan is a sacred month of fasting, prayer, reflection, and community for Muslims worldwide. It is a time of spiritual renewal, self-discipline, and devotion to Allah, marked by fasting from dawn until sunset, increased prayers and Quran recitation, acts of charity, and communal gatherings. Ramadan holds deep significance in the Islamic faith, serving as a time for believers to deepen their connection with Allah, strengthen their faith, and renew their commitment to living a righteous and compassionate life.

### **The Effects of Ramadan on Children's Academic Performance**

These studies provide valuable insights into the diverse effects of Ramadan fasting on children's cognitive abilities and academic performance, highlighting the need for further research to understand this complex relationship better. The impact of fasting during Ramadan on children's cognitive abilities and academic performance:

**Tabel 1.** The impact of fasting during Ramadan

No	Study	Findings	References
1	Tian, H. H., Aziz, A. R., Png, W., Wahid, M. F., Yeo, D., & Png, A. L. C. (2011).	The effect of fasting on cognition is heterogeneous and domain-specific. There was no significant fasting effect on visual learning and working memory.	Tian, H. H., Aziz, A. R., Png, W., Wahid, M. F., Yeo, D., & Png, A. L. C. (2011). Effects of fasting during Ramadan month on cognitive function in Muslim athletes. <i>Asian Journal of Sports Medicine</i> , 2(3), 145.
2	Cherif, A., Roelands, B., Meeusen, R., & Chamari, K. (2016).	Immunological variables are also involved in cognitive functioning and that intermittent fasting might impact the relationship between cytokine expression in the brain and cognitive deficits, including memory deficits.  Daytime fasting can potentially have adverse effects on certain areas such as coping mechanisms and decision-making abilities.	Cherif, A., Roelands, B., Meeusen, R., & Chamari, K. (2016). Effects of intermittent fasting, caloric restriction, and Ramadan intermittent fasting on cognitive performance at rest and during exercise in adults. <i>Sports medicine</i> , 46, 35-47.
3	Dolu, N., Yapislar, H., & Khan, A. (2018).	Ramadhan Fasting may adversely affect cognitive functions such as perception, sustained attention, and decision-making. This is likely to be relevant clinically to those with a greater risk of cognitive dysfunction such as the elderly.	Dolu, N., Yapislar, H., & Khan, A. (2018). Effect of Ramadan fasting on cognitive functions using p300 event related potential and the cancellation test. <i>J Neurosci Clin Res</i> , 3(1), 1-3.
4	Rachid, H., Charaf, K., Hosbane, S., & Agoub, M. (2021).	Ramadan fasting had no impact on the cognitive function of the medical students.	Rachid, H., Charaf, K., Hosbane, S., & Agoub, M. (2021). The benefits of ramadan fasting on the cognitive function of medical students. <i>Journal of Nutrition, Fasting and Health</i> , 9(2), 120-124.
5	Bougrine, H., Cherif, M., Chtourou, H., & Souissi, N. (2023).	During Ramadhan Fasting, the fluctuations in cognitive and physical performance among young female handball players could potentially be reduced or even reversed.	Bougrine, H., Cherif, M., Chtourou, H., & Souissi, N. (2023). Does Ramadan intermittent fasting affect the intraday variations of cognitive and high-intensity short-term maximal performances in young female handball players?. <i>Biological Rhythm Research</i> , 54(4), 399-418.
6	Qasrawi, S. O., Pandi-Perumal, S.	Factors such as sleep patterns, duration, light exposure, and energy use	Qasrawi, S. O., Pandi-Perumal, S. R., & BaHammam, A. S. (2017). The effect of intermittent fasting during

	R., & BaHamam, A. S. (2017).	don't indicate that intermittent fasting during Ramadan leads to increased daytime sleepiness or changes in cognitive function. No impact of fasting on circadian rhythms.	Ramadan on sleep, sleepiness, cognitive function, and circadian rhythm. <i>Sleep and Breathing</i> , 21, 577-586.
7	Erdem, O. (2018).	Fasting in the month of Ramadan has been effective in diminishing stress, anxiety, and depression levels.	Erdem, O. (2018). The investigation of the effects of Ramadan fasting on the mood state of healthy volunteer persons. <i>Family Practice and Palliative Care</i> , 3(1), 1-6.
8	Cay, M., Senol, D., Cuglan, S., Cevirgen, F., & Ozbag, D. (2018).	Fasting has an effect on proprioceptive sense, even though partly.	Cay, M., Senol, D., Cuglan, S., Cevirgen, F., & Ozbag, D. (2018). Evaluating of the effects of ramadan fasting on ankle proprioception performance. <i>Ann Med Res</i> , 25(2), 207-210.
9	Miladi, A., Saafi, M. A., & Latiri, I. (2024).	The academic performance and overall well-being of children/adolescents were not affected by Ramadan fasting	Miladi, A., Saafi, M. A., & Latiri, I. (2024). Effects of Ramadan on cognitive functions in young boys. <i>Libyan Journal of Medicine</i> , 19(1), 2301830.
10	Farooq, A., Herrera, C. P., Almudahka, F., & Mansour, R. (2015).	Fasting during Ramadan leads to a decrease in attention among young children.	Farooq, A., Herrera, C. P., Almudahka, F., & Mansour, R. (2015). A prospective study of the physiological and neurobehavioral effects of Ramadan fasting in preteen and teenage boys. <i>Journal of the Academy of Nutrition and Dietetics</i> , 115(6), 889-897.
11	Pollitt, E., Leibel, R. L., & Greenfield, D. (1981).	Fasting negatively impacted problem-solving accuracy while positively affecting immediate recall in short-term memory.	Pollitt, E., Leibel, R. L., & Greenfield, D. (1981). Brief fasting, stress, and cognition in children. <i>The American journal of clinical nutrition</i> , 34(8), 1526-1533.

Based on the provided table, a diverse range of studies have investigated the effects of fasting, particularly during Ramadan, on cognitive function. Tian et al. (2011) found no significant fasting effect on visual learning and working memory in Muslim athletes. However, Cherif et al. (2016) suggested that intermittent fasting might affect the relationship between cytokine expression in the brain and cognitive deficits, including memory deficits, indicating a potential role of immunological variables. Moreover, Dolu et al. (2018) observed adverse effects on cognitive functions such as perception, sustained attention, and decision-making during Ramadan fasting, especially relevant to populations at risk of cognitive dysfunction like the elderly. Contrastingly, Rachid et al. (2021) reported no impact of Ramadan fasting on the cognitive function of medical students, suggesting variability in fasting effects across different demographic groups. Similarly, Bougrine et al. (2023) highlighted the potential for fluctuations

in cognitive and physical performance among young female handball players during Ramadan fasting, but the study did not provide conclusive evidence of negative effects.

Qasrawi et al. (2017) and Erdem (2018) indicated no significant increase in daytime sleepiness or changes in cognitive function during intermittent fasting, which contrasts with the findings of Farooq et al. (2015), who observed a decrease in attention among young children during Ramadan fasting. Additionally, Cay et al. (2018) suggested that fasting might partly affect proprioceptive sense.

Miladi et al. (2024) found that Ramadan fasting did not affect the academic performance and overall well-being of children/adolescents, providing reassurance about potential concerns regarding cognitive function during fasting periods. However, Pollitt et al. (1981) highlighted that fasting negatively impacted problem-solving accuracy while positively affecting immediate recall in short-term memory.

In conclusion, the effects of fasting on cognitive function appear to be heterogeneous and influenced by various factors such as age, demographic characteristics, and study methodologies. While some studies suggest potential adverse effects on specific cognitive domains, others report no significant impact or even benefits in certain populations. Further research is necessary to elucidate the complex relationship between fasting and cognitive function and to identify strategies for optimizing cognitive health during fasting periods.

Moreover, the impact of fasting on children's academic performance is likely influenced by socio-cultural factors, such as family support, dietary habits, and sleep patterns during Ramadan. Adequate sleep and balanced nutrition during Ramadan were associated with better academic performance among school-age children. Conversely, disruptions in sleep and dietary patterns during fasting may contribute to fatigue, irritability, and decreased academic engagement, potentially affecting learning outcomes. Furthermore, the educational context, including school policies and support systems, may play a crucial role in mediating the impact of fasting on academic performance. For instance, schools with flexible schedules and accommodations for fasting students may mitigate the negative effects of fasting on learning. Additionally, nutritional and sleep hygiene interventions during Ramadan may optimize children's cognitive function and academic achievement. By addressing these socio-cultural and educational factors, educators and policymakers can better support children's academic success and well-being during Ramadan. Fasting during Ramadan may have complex implications for children's cognitive abilities and academic performance, influenced by physiological, psychological, and socio-cultural factors. While some studies suggest potential negative effects of fasting on cognitive function, others indicate neutral or beneficial effects. Socio-cultural factors like family support and dietary habits may further modulate the relationship between fasting and academic performance. Future research should continue to investigate the nuanced effects of fasting on children's cognitive abilities and academic achievement, considering diverse populations and contexts. Additionally, interventions promoting healthy sleep and nutrition during Ramadan may help optimize children's academic outcomes.

From the analysis of the impact of fasting during Ramadan on children's cognitive abilities and academic performance, the relationship is multifaceted and influenced by various factors. While some studies suggest potential negative effects of fasting on cognitive function and academic performance, such as decreased attention and memory, others indicate neutral or beneficial effects. Socio-cultural factors, including family support, dietary habits, and sleep patterns during Ramadan, may further modulate the impact of fasting on children's cognitive abilities and academic achievement. Additionally, the educational context, such as school policies

and support systems, can play a crucial role in mediating the effects of fasting on academic performance. Overall, the findings underscore the importance of considering individual differences, socio-cultural factors, and educational interventions when examining the impact of Ramadan fasting on children's cognitive abilities and academic performance. Further research is needed to elucidate the nuanced effects of fasting and to develop targeted interventions to support children's academic success during Ramadan.

### **Culture, Fasting, and Learning: Understanding the Ramadan Impact on Children's Academic Achievement**

The relationship between Ramadan fasting and children's academic achievement is influenced by various sociocultural factors shaping children's experiences during fasting. One significant sociocultural factor is family support, which is crucial in determining how children navigate fasting and its impact on their academic performance. Children who received adequate support from their families during Ramadan, including encouragement and assistance with managing their fasting obligations, reported better academic performance than those who lacked such support.

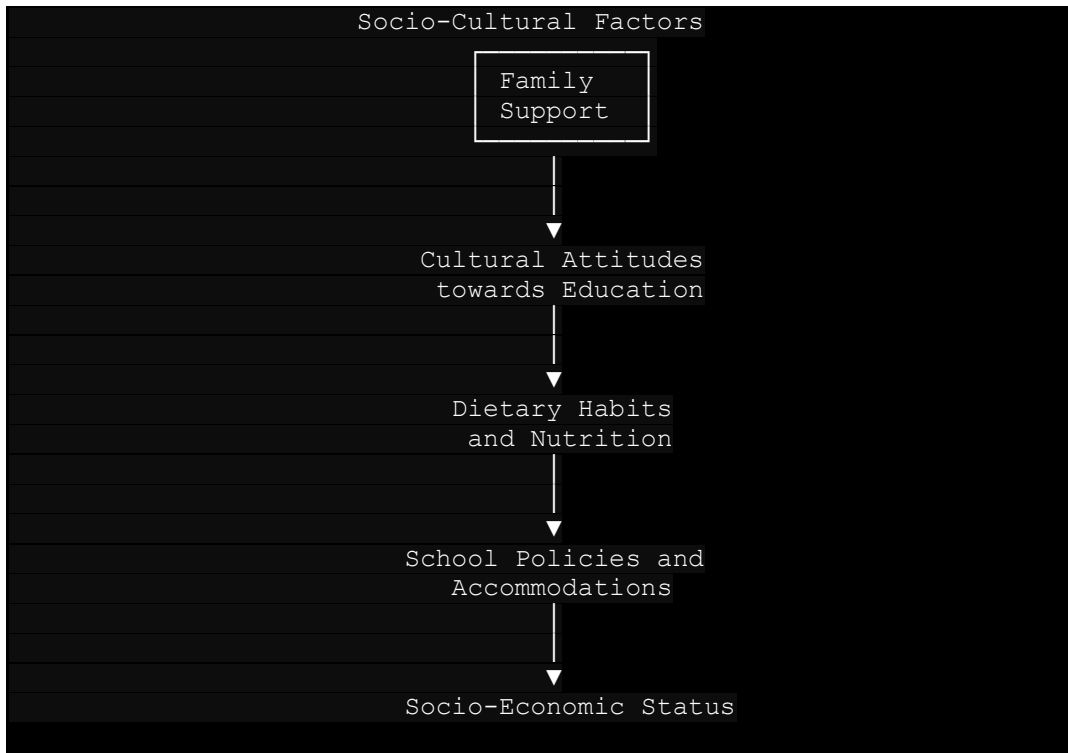
Additionally, cultural attitudes towards education and fasting can influence children's academic achievement during Ramadan. In cultures where academic success is highly valued, parents may prioritize their children's education by implementing strategies to mitigate any potential negative effects of fasting on learning. Conversely, in cultures where fasting is prioritized over academic pursuits during Ramadan, children may face greater challenges in maintaining academic performance. Decreased academic performance among elementary school children during Ramadan, partly attributed to cultural attitudes towards fasting and education. Moreover, dietary habits and nutritional intake during Ramadan can impact children's cognitive function and academic performance. Inadequate nutrition during fasting hours may lead to fatigue, decreased concentration, and poor academic engagement. However, studies have shown that balanced nutrition and hydration strategies during non-fasting hours can help mitigate these effects. Therefore, sociocultural norms surrounding dietary practices during Ramadan can significantly influence children's academic achievement.

Furthermore, the role of schools and educational institutions in accommodating fasting students can affect their academic success during Ramadan. Schools with flexible schedules, supportive teachers, and accommodations for fasting students may facilitate a conducive learning environment during the fasting period. Conversely, schools that do not acknowledge or accommodate the needs of fasting students may contribute to academic challenges and disparities. The study found no significant difference in cognitive performance between fasting and non-fasting children in schools that provided supportive environments for fasting students. Additionally, socioeconomic factors, such as access to resources and socioeconomic status, can intersect with sociocultural factors to influence children's academic achievement during Ramadan. Children from socio-economically disadvantaged backgrounds may face additional challenges during fasting, including limited access to nutritious food and healthcare services. Consequently, socioeconomic disparities may exacerbate the impact of fasting on academic performance among marginalized populations.

Sociocultural factors are critical in shaping the relationship between Ramadan fasting and children's academic achievement. Family support, cultural attitudes towards education and fasting, dietary habits, school accommodations, and socioeconomic factors influence children's experiences during the fasting period. Recognizing and addressing these sociocultural factors are essential for promoting equitable educational opportunities and supporting the academic success



of fasting children during Ramadan. Below is a simple diagram illustrating the socio-cultural factors that influence the relationship between Ramadan fasting and children's academic achievement:



**Picture 1.** The Socio-Cultural Factors

In this diagram, each factor is represented in a box, and arrows indicate the influence or relationship between the factors. Family support influences cultural attitudes towards education, impacting dietary habits and nutrition during Ramadan. School policies and accommodations are influenced by cultural attitudes and, in turn, influence children's academic achievement. Socio-economic status intersects with all other factors, influencing and being influenced by them in complex ways. These socio-cultural factors shape the relationship between Ramadan fasting and children's academic achievement.

Family support is crucial in shaping children's experiences during Ramadan fasting and academic achievement. Supportive families provide encouragement, assistance, and resources to help children manage fasting obligations while maintaining academic responsibilities. For example, parents may adjust meal times and sleep schedules to ensure children have adequate rest and nutrition during non-fasting hours. Furthermore, families may prioritize education by creating a conducive study environment and providing academic guidance and assistance. Cultural attitudes towards education influence how communities prioritize academic pursuits during Ramadan fasting. In cultures where education is highly valued, families may emphasize the importance of maintaining academic performance despite fasting obligations. For instance, communities may organize study groups or provide additional educational resources to support children during Ramadan. Conversely, in cultures where fasting precedes education during Ramadan, children may face pressure to prioritize religious observance over academic achievement.

Dietary habits and nutrition during Ramadan fasting can significantly impact children's cognitive function and academic performance. Balanced nutrition and hydration strategies during non-fasting hours are essential for sustaining energy levels and cognitive function throughout the day. For example, children who consume nutrient-rich meals during pre-dawn and evening meals may experience better concentration and academic engagement than those with poor dietary habits during Ramadan.

School policies and accommodations can support or hinder children's academic achievement during Ramadan fasting. Schools with flexible schedules, supportive teachers, and accommodations for fasting students create a conducive learning environment during the fasting period. For instance, schools may adjust exam schedules, provide additional breaks, or offer alternative assignments to accommodate fasting students. Conversely, schools that do not acknowledge or accommodate the needs of fasting students may contribute to academic challenges and disparities. Socio-economic status intersects with all other socio-cultural factors and influences children's experiences during Ramadan fasting and academic achievement. For example, children from socio-economically disadvantaged backgrounds may face additional challenges during fasting, such as limited access to nutritious food and healthcare services. Additionally, socio-economic disparities may affect families' ability to provide academic support and resources, further impacting children's academic performance during Ramadan.

These socio-cultural factors interact complexly to shape the relationship between Ramadan fasting and children's academic achievement. Understanding and addressing these factors are essential for promoting equitable educational opportunities and supporting the academic success of fasting children during Ramadan. By recognizing the influence of family support, cultural attitudes, dietary habits, school policies, and socio-economic status, educators and policymakers can develop targeted interventions to mitigate any negative effects of fasting on children's academic performance and foster inclusive learning environments during Ramadan.

### **Strategies for Supporting Children's Academic Success During Fasting**

According to the analysis of the data, there are specific strategies or interventions to mitigate the negative effects of fasting on children's academic performance during Ramadan:

1. **Nutritional Guidance;** Guide balanced eating habits during non-fasting hours to ensure children receive adequate nutrition and hydration. For example, encourage children to consume nutrient-rich foods such as fruits, vegetables, whole grains, and lean proteins during pre-dawn and evening meals. This can help sustain energy levels and cognitive function throughout the day, supporting academic performance.
2. **Hydration Strategies;** Emphasize the importance of staying hydrated during non-fasting hours to prevent dehydration and maintain cognitive function. Encourage children to drink plenty of water and avoid sugary or caffeinated beverages, which can contribute to dehydration. Access to water bottles or hydration stations at school can facilitate hydration throughout the day.
3. **Flexible School Policies;** Advocate for flexible school policies and accommodations for fasting students, such as adjusted schedules, exam timings, and assignments. For example, schools can schedule exams and major assignments outside fasting hours or provide alternative assessment options for fasting students. This allows fasting children to participate fully in academic activities without compromising their religious obligations.
4. **Supportive School Culture;** Foster a supportive and inclusive school culture that values diversity and respects religious observances. Educate teachers, staff, and students about Ramadan fasting and its potential impact on academic performance. Encourage empathy,

- understanding, and acceptance of fasting children within the school community to create a supportive learning environment.
5. **Family Involvement;** Involve parents and caregivers in supporting fasting children's academic success by providing resources, guidance, and emotional support. Encourage families to create a conducive study environment at home and to prioritize their children's education during Ramadan. For example, parents can establish daily study routines, provide academic assistance, and communicate their children's needs with teachers.
  6. **Peer Support Networks;** Facilitate peer support networks or study groups for fasting children to share experiences, exchange academic resources, and provide mutual support. Peer support can reduce isolation and stress among fasting children and promote academic collaboration and motivation. Schools can organize peer mentoring programs or facilitate virtual study sessions for fasting students.
  7. **Time Management Skills;** Teach fasting children effective time management and organizational skills to help them balance their academic and religious obligations during Ramadan. Provide strategies for prioritizing tasks, setting goals, and managing study time efficiently. For example, encourage children to create daily or weekly schedules, use planners or digital tools for task management, and break larger tasks into smaller, manageable steps.
  8. **Emotional Well-being Support;** Offer emotional well-being support services for fasting children to address stress, anxiety, or other mental health concerns that may arise during Ramadan. Provide access to school counsellors, mental health professionals, or support groups where fasting children can seek guidance, counselling, or peer support. Promote self-care practices such as mindfulness, relaxation techniques, and stress management strategies to support children's well-being.
  9. **Physical Activity Opportunities;** Encourage physical activity and exercise during non-fasting hours to promote overall health and well-being among fasting children. Organize sports activities, recreational games, or fitness classes before or after school to allow children to stay active and energized during Ramadan. Physical activity can enhance mood, concentration, and cognitive function, supporting academic performance.
  10. **Continued Academic Support;** Provide continued academic support and resources for fasting children throughout Ramadan. Monitor students' progress, identify academic challenges or needs, and offer additional assistance or interventions. Collaborate with teachers, parents, and other stakeholders to develop personalized academic plans or accommodations for fasting students to ensure they have the support they need to succeed academically.

These strategies and interventions can help mitigate the negative effects of fasting on children's academic performance during Ramadan by addressing nutritional, hydration, scheduling, social, emotional, and academic needs. By implementing a holistic approach that involves multiple stakeholders and supports children's overall well-being, educators, families, and communities can create inclusive learning environments that foster academic success for fasting children during Ramadan.

## **CONCLUSION**

This research has explored the multifaceted relationship between Ramadan fasting and children's academic performance, addressing three key research questions. Firstly, the investigation into the impact of fasting during Ramadan on children's cognitive abilities and academic performance revealed a complex interplay of factors, including physiological, psychological, and socio-cultural influences. While some studies suggest potential negative

effects of fasting on cognitive function, others indicate neutral or beneficial effects, underscoring the need for nuanced understanding and further research. Secondly, examining socio-cultural factors influencing the relationship between Ramadan fasting and children's academic achievement highlighted the importance of family support, cultural attitudes towards education, dietary habits, school policies, and socio-economic status. These socio-cultural factors interact in complex ways to shape children's experiences during fasting and academic outcomes, emphasizing the significance of holistic approaches to support fasting children. Lastly, the exploration of specific strategies and interventions to mitigate the negative effects of fasting on children's academic performance during Ramadan identified various approaches, including nutritional guidance, hydration strategies, flexible school policies, supportive school cultures, family involvement, peer support networks, time management skills, emotional well-being support, physical activity opportunities, and continued academic support.

This research underscores the importance of recognizing and addressing the diverse needs of fasting children during Ramadan to promote educational equity and well-being. Implementing targeted interventions, fostering supportive environments, and involving multiple stakeholders, educators, families, and policymakers can create inclusive learning environments supporting academic success and fasting children's holistic development. Further research is needed to explore the long-term effects of fasting on children's academic performance and the effectiveness of specific interventions in diverse cultural and educational contexts. Collaboration between researchers, practitioners, and communities is essential for developing evidence-based strategies to support fasting children's academic success and well-being during Ramadan and beyond.

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