After the Shock
Reform, Resilience, and Economic Transformation in MENA
ERF 32nd Annual Conference
June 14-16 | Cairo, Egypt

2026

Religious Observance and Criminal Behavior:

The Case of Ramadan in Türkiye

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Abstract

Ramadan fosters virtues such as patience, self-control, and ethical conduct, which contribute to a reduction in crime rates. This study examines the effect of Ramadan on crime rates in Türkiye, hence testing the aforementioned hypothesis. Our findings indicate a 23% decrease in homicides, a 5% reduction in assaults, and a 65% decline in traffic-related offenses. Nonetheless, we discovered no evidence suggesting that Ramadan affects substance-related drug crimes. Furthermore, we analyze the potential mechanisms underlying these reductions, positing that the observed decreases during Ramadan are due to modifications in individual-level beliefs and behaviors. Alternative mechanisms, including social interactions and physical fatigue, do not significantly contribute to the observed reductions in crime rates during Ramadan. We also observe that the sacred night of Laylat al-Qadr, occurring within the month of Ramadan, significantly influences the reduction of crime rates across nearly all categories of offenses. Additionally, the enduring impact of Ramadan on crime yields ambiguous results.

Keywords: Religion, Ramadan, Fasting, Crime

JEL codes: K14, K42, Z12, C23

1. Introduction

In Islamic practice, fasting during Ramadan is recognized as one of the five essential pillars of the faith, incumbent upon all adherents. The fasting period begins at pre-dawn and concludes at sunset. During this time, the consumption of food and drink is prohibited for Muslims. Exemptions from this requirement are granted to pregnant women, children, the sick, long-distance travelers, women experiencing menstruation, and those who are breastfeeding. The Qur'an, in Surah Al-Baqarah, verses 183-187, establishes the divine commandment for fasting (Asad, 1980, 2:183-187). Through the crucible of personal spiritual growth, Ramadan aims to instill resilience in the face of hunger and thirst. Further elaborating on the principles from the Qur'an, the Prophetic traditions (Hadith) identify Ramadan as the "month of patience" (Shahr al-Sabr) and explicitly state that "fasting is half of patience" (Al-Bazzar, 2009, Hadith 3241; Al-Bayhaqī, 2003, Hadith 3634). This cultivated resilience is consequently expected to enable individuals to maintain ethical conduct, irrespective of external circumstances, thereby benefiting others. This includes the capacity to abstain from engaging in criminal activity. When faced with provocation, a fasting person is instructed to respond, "I am fasting" (Innī ṣāʾimun), a practice that reinforces a patient and non-reactive disposition (Al-Bukhārī, 1995a (Hadith 1894); Muslim ibn Al- Ḥajjāj, 2007, Hadith 1151).

Building on this premise, in this paper, we investigate the extent to which the days of Ramadan can reduce crime rates in Türkiye. For this purpose, we utilize the universal daily criminal records of the Ministry of Justice, which cover the years 2010 and 2023. Exploiting the exogenous shift in the starting days of Ramadan over the years, our main findings indicate a decline in crime rates, ranging from a 5% reduction in theft crimes to a 23% decrease in homicide and a 65% decrease in traffic crimes.

Then, we explore possible mechanisms behind the reduced impact of Ramadan days on crimes. To understand these observed reductions in crime, several likely channels relate

religious behavior to crime at the individual and community levels. Moreno-Medina (2023) indicates that, in this regard, the effect of religion on crime involves people weighing the costs and benefits of their actions. In other words, individuals consider the reward and punishment of committing a crime in the afterlife, a concept also known as the hellfire hypothesis in the literature (Hirschi and Stark, 1969). Additionally, the latter is related to community-level interactions such as peer effects and social capital that can have a significant impact on crime. In this paper, we distinguish between the two mechanisms by implementing various channel analyses.

To empirically test these proposed mechanisms, we first investigate the social gatherings channel, utilizing the exogeneity of COVID-19 restrictions in 2020 and 2021, which also coincided with Ramadan, to explore whether the reduced impact of Ramadan on crime stems from community-level interactions. Of interest here is the increase in the magnitudes of the estimates of crime rates, which rules out the possibility that the effect of Ramadan on crime results from community-level spillovers and shifts the focus to individual-level behaviors regarding changes in believers' beliefs and attitudes during Ramadan.

Then, the subsequent mechanism analysis emphasizes an event study design, wherein we segment our analysis into three distinct periods: pre-Ramadan, Ramadan, and post-Ramadan. Investigating the pre-Ramadan period helps discern whether individuals engage in mental preparation prior to Ramadan. In other words, our objective is to observe whether individuals begin altering their behaviors in anticipation of Ramadan, thereby enabling us to assert that the reduction in crimes during Ramadan is attributable to heightened religiosity among individuals. Indeed, this observation holds true, as we note a decrease in criminal activities prior to the commencement of Ramadan, particularly during the month of Sha’ban.

Furthermore, it is acknowledged that adherents are prohibited from consuming food or beverages throughout the fasting period. This extended and continuous fasting may contribute to fatigue and lead to notable decreases in criminal activity by the conclusion of Ramadan, possibly explaining the observed substantial reductions in crimes during this

period. Conversely, the evidence suggests that individual beliefs and behaviors play a pivotal role in mitigating criminal incidents during Ramadan, as the magnitude of the effects diminishes towards the end of the month.

The following analysis suggests that the positive impact of Ramadan on crime rates diminishes in significance immediately after Ramadan concludes. Commencing with Eid al-Fitr, although the outcome is negative, it remains statistically indistinguishable from zero for most crime types and even positive for traffic-related crimes. Accordingly, we observe insufficient evidence to assert that fasting during Ramadan exerts a significant impact on crime rates over extended periods.

Finally, to ensure the robustness of our findings, we also conduct an analysis to determine whether the reduced impact of Ramadan on crime is limited to regions where fasting is of considerable importance to the public. Our findings still indicate a reduced impact of Ramadan on crime, even when we consider only the regions, as the fasting percentage is minimal, which assesses the robustness of our main findings.

While our study contributes new evidence and methodologies to this area, it is important to situate our findings within the broader academic discourse. Research generally indicates a decrease in crime rates during the month of Ramadan (Birkholz & Gomtsyan, 2023; Datta & Mohammed, 2024; Reese et al., 2017). Nevertheless, studies diverge regarding the mechanisms through which this effect occurs. Therefore, this section will review the pertinent literature examining the relationship between crime and the month of Ramadan.

A foundational aspect of this inquiry involves understanding the causal effect of religion on crime, which has been extensively researched, with studies investigating diverse crime outcomes, including total crime, violent crimes, and property crimes (Birkholz & Gomtsyan, 2023; Datta & Mohammed, 2024; Reese et al., 2017; Hodler et al., 2024). For example, in Switzerland, data on Muslim immigrants revealed an 11% decline in reported crimes during Ramadan (Birkholz & Gomtsyan, 2023). This finding strongly aligns with explanations centered on shifts in deeply held beliefs and values during this sacred month, positing these as the primary drivers rather than mere changes in daily routines or physical capacity.

Furthermore, Datta and Mohammed (2024) studied the impact of Ramadan on criminal behavior in Bihar, India, using a difference-in-differences approach to compare crime rates between Muslim and non-Muslim populations during Ramadan. Their analysis revealed a notable decrease in most violent and non-violent crimes committed by Muslims, including significant reductions in murder, riot, theft, and kidnapping. These findings support the notion that higher religious adherence during this period is associated with reduced criminal behavior among adherents.

Similarly, Reese et al. (2017) examined large-scale violence related to significant Islamic holidays—those with national public observance—on violence levels in Iraq, Afghanistan, and Pakistan from 2004 to 2014. They found consistent reductions in violence during these holidays, with decreases of 25% to 41% compared to average days. This effect was absent during other religious or secular holidays without national days off, such as most days of Ramadan, indicating that religious significance, rather than just time off, drives this effect. The proposed mechanism involves increased societal disapproval of violence during these times, which risks militant groups losing public support, offsetting tactical advantages. Qualitative evidence supports this, showing public outrage and militant fear of this outrage.

More recently, Hodler et al. (2024) examined whether the intensity of religious experience, particularly the duration of Ramadan fasting, affects terrorism in predominantly Muslim countries. They discovered that longer, more intense fasting significantly reduces the likelihood of local terrorist events and fatalities in the following year. Their survey data further revealed that intense fasting reduces the number of individuals who justify religiously motivated violence. These results challenge the idea that intense religious experiences promote terrorism; rather, they indicate that such experiences can lower public support for terrorism, thereby reducing attacks. The proposed mechanism suggests that the communal and spiritual aspects of Ramadan reshape Muslims' perceptions of acceptable behavior, decreasing support for political violence.

Our research also contributes to several strands of literature regarding the relationship between religion and various outcome variables, encompassing aspects beyond crime. For

instance, fasting may result in dietary modifications and weight fluctuations (Benaji et al., 2006; Alkandari et al., 2012), disrupted sleep patterns (Benaji et al., 2006; Toda & Morimoto, 2000), metabolic changes influencing glucose, lipids, and other markers (Alkandari et al., 2012), significant fatigue, lethargy, and irritability during prolonged fasting (Leiper et al., 2003; Alkandari et al., 2012), traffic accidents (Ali et al., 2024), positive mood (Afifi, 1997; Nugraha et al., 2017; Gilavand & Fatahiasl, 2018), improved student performance (Hornung et al., 2023), increased likelihood of acquittals of offenders and reduced economic outcomes (Mehmood & Seror, 2020), The religious calendar, particularly Ramadan, takes precedence over all other temporal commitments for Muslims, including critical matters like blood feuds (Hughes, 2023).

Studies conducted in Türkiye present a nuanced perspective on the impacts of Ramadan fasting, revealing both public health challenges and psychosocial benefits. In the realm of public safety, Gulek (2024) found that fasting during peak traffic hours elevates the risk of accidents by 25%, a risk factor exceeding mild sleep deprivation but still falling below that of alcohol intoxication. The same study observed that this effect was more pronounced in religious localities where daylight saving time extended the duration of the daily fast. Conversely, research into mortality patterns during Ramadan indicates positive social outcomes. An analysis of autopsy data from Konya between 2000 and 2009 showed a reduction in suicides and homicides, even as accidental and natural deaths rose (Demirci, Doğan, & Koç, 2013). This finding is consistent with a separate 33-year longitudinal study in Istanbul (1978–2012), which reported a significant decrease in suicide rates during Ramadan, attributing this to the holy month's spiritual influence and religious prohibitions against self-harm (Taktak et al., 2016). Beyond mortality, the influence of fasting on religious observance itself has been quantified. Employing a natural experiment, Aksoy and Gambetta (2022) demonstrated a causal link between longer fasting hours and increased religiosity, as evidenced by higher participation in religious education and support for faith-based political movements.

Our study makes a significant contribution to the current literature in several ways. First, to our knowledge, this is the first study in Türkiye to undertake a longitudinal analysis of the

causal link between religion and crime. Secondly, researching the relationship between religion and crime in a secular country, as indicated in its constitution (Constitution of the Republic of Türkiye, Article 3, 1982), and approximately 94.3% of its population claims to believe in Allah (Nişancı, 2023). Moreover, this research stands as the pioneering investigation to systematically examine the nexus between Ramadan and crime across nine specific categories: homicide, assault, robbery, theft, property damage, ill-treatment, traffic violations, drug use, and drug sales.

The remainder of the paper is organized as follows. In the next section, we discuss our data and empirical methodology. Section 3 presents our main results along with the underlying mechanism. Section 4 presents the outcomes of the robustness analysis, which considers the fasting rates of different regions. Section 5 concludes by discussing the main findings.

2. Data and Empirical Methodology

2.1. Data

In this study, we utilize a novel administrative dataset obtained from the Turkish Ministry of Justice, which covers daily records of criminal activity across 81 provinces between January 1, 2010, and May 31, 2023. Our primary dependent variables are the daily provincial crime rates for nine distinct offense categories: homicide, assault, theft, robbery, damage to property, ill-treatment, drug use, drug sales, and traffic-related offenses (For more information concerning Criminal Offenses, Descriptions, Penalties, and Aggravating Circumstances, please see Appendix Table 1). Table 1 presents descriptive statistics for each crime type, along with key covariates used in the analysis.

Insert Table 1

Each crime variable is normalized to represent the number of cases per 100,000 individuals. The average daily crime rate varies by category, with assault (mean = 3.89) and theft (mean = 3.08) being among the most frequently recorded offenses. In contrast, homicide (mean = 0.62) and ill-treatment (mean = 0.48) are less frequent. The variable Ramadan is a binary

indicator that takes the value of 1 on days that fall within the Islamic month of Ramadan and zero otherwise.

To ensure accurate measurement of criminal activity, we use data from the prosecutorial phase of the criminal justice process—specifically, the number of investigation files reviewed by the prosecutor, categorized by the date of the offense. This choice is motivated by the structure of the Turkish criminal justice system, which comprises three distinct phases: investigation, prosecution, and sentencing (see Figure 1). The investigation phase begins once authorities are informed of a potential crime and ends when the prosecutor decides whether or not to file charges.

Insert Figure 1

While one might consider using reports or complaints filed with the judicial police as a proxy for criminal activity, this measure suffers from several limitations. Not all reports are routed through the judicial police, and not all reports received by the police lead to formal investigations. In contrast, files examined by prosecutors offer a more reliable and filtered indicator, as they reflect cases that have undergone preliminary scrutiny and are more likely to constitute actual offenses. Furthermore, by aligning crime data with the date of the offense rather than the date of file initiation, we mitigate potential temporal misalignments between crime occurrence and case documentation, thereby increasing the precision of our estimations.

In total, our panel dataset consists of 395,604 observations across province-day combinations. This rich temporal and geographic variation enables us to estimate the causal effects of Ramadan on crime outcomes while controlling for unobserved heterogeneity through fixed effects and other covariates. The next section outlines the empirical strategy we employ to identify these effects.

2.2. Empirical Methodology

We examine the causal impact of Ramadan on various crime types using a panel data framework. For this purpose, we estimate the following equation:

$$Y_{pt} = \alpha + \beta Ramadan_t + \Omega + \varepsilon_{pt} \quad (1)$$

where Y_{pt} is the outcome of interest in the province p and day t. The key variable of interest, $Ramadan_t$, is an indicator variable that equals one if the given day t falls in Ramadan. Ω captures day of month, month, year, and province fixed effects. ε_{pt} is the error term.

The Islamic (Hijri) calendar comprises 12 lunar months, and Ramadan is its ninth month. Based on moon sighting, it takes 29 to 30 days. The Hijri calendar employs a lunar system, in which the month of Ramadan advances 10 to 12 days annually relative to the Gregorian calendar. For example, in 2021, Ramadan started on April 13 and ended on May 12; in 2022, it started on April 2 and ended on May 1. Therefore, our identification stems from the exogenous variation observed in the changing days of Ramadan each year.

We first estimate Equation 1 using the Ordinary Least Squares (OLS) method, in which we transform our outcome variables using the inverse hyperbolic sine transformation to address the right skewness of our dependent variables, which is caused by the presence of many zeros for a given province and day. Then, we use the Poisson Pseudo Maximum Likelihood (PPML) method to estimate Equation 1, which is particularly useful and recommended in studying dependent variables with many zeros (Santos Silva & Tenreyro, 2011).

We further investigate likely mechanisms that can explain our main results: First, we explore the social gathering channel where believers unite to break their fast after sunset. This will require extensive preparations, including house cleaning, shopping, and cooking, leaving less time to plan and execute criminal activities. We perform tests to verify whether this mechanism explains the reduced impact of the holy month of Ramadan on crimes by estimating Equation (1), using only 2020 and 2021 data from the dataset, as lockdowns due to the COVID-19 pandemic occurred in these years in Türkiye. There are two rationales for employing the COVID-19 restrictions to investigate whether the social events mechanism elucidates our primary findings. First, the COVID-19 restrictions coincided with the days of Ramadan during those years. Second, individuals were prohibited from engaging in outdoor

activities and social gatherings during that period, thereby affording those inclined towards criminal activities the requisite time for planning and executing such activities.

Secondly, we conduct an analysis using an event study-type design segmented into three distinct phases: pre-Ramadan, Ramadan, and post-Ramadan. This design enables the investigation of trends in crime rates throughout the pre-Ramadan, Ramadan, and post-Ramadan periods. The exploration of the pre-Ramadan period, particularly the month of Sha'ban, holds significant importance as it allows for the observation of whether individuals undertake preparations for Ramadan in advance by engaging in reduced criminal activities, thus mentally preparing themselves for the forthcoming month. Subsequently, we examine whether prolonged fasting affects the ability to commit or detect criminal acts, particularly due to the diminished physical capacity that occurs during Ramadan. Additionally, we investigate whether the month of Ramadan has a lasting impact on crime rates, with a focus on the period immediately following Ramadan.

We also conduct an examination of the Laylat al-Qadr and Eid al-Fitr periods within the framework of the event study to ascertain whether any patterns of criminal activity are associated with these significant observances. While Ramadan is fundamentally a holy month for Muslims, it encompasses a sacred night during which the Qur'an commenced its revelation to the Prophet Muhammad (PBUH). This singular night holds such profound significance that Allah, the Exalted, dedicated an entire surah to it: Surah Al-Qadr.

"*BEHOLD, from on high have We bestowed this [divine writ] on the Night of Destiny.* **[1]** *And what could make thee conceive what it is, that Night of Destiny?* **[2]** *The Night of Destiny is better than a thousand months:* **[3]** *in hosts descend in it the angels, bearing divine inspiration by their Sustainer's leave; from all [evil] that may happen* **[4]** *does it make secure, until the rise of dawn.* **[5]**" (Asad, 1980, 97:1-5)

However, the Qur'an does not specify the exact date of this night; intertextual interpretations suggest its occurrence within the month of Ramadan, particularly during the last ten days. In Türkiye, it is commemorated on the 26th day of Ramadan (27th night of Ramadan).

Subsequently, we conduct a robustness analysis utilizing data concerning the prevalence of regular fasting across various regions of Türkiye. This approach offers the advantage of enabling us to determine whether the reduced effect of Ramadan on crime rates can be attributed explicitly to regions where religiosity plays a significant role. Accordingly, we limit our analysis to regions such as the Aegean, Mediterranean, and Western areas, as these possess the lowest rates of fasting and are referenced in estimating equation (1).

3. Results

3.1. Main results

We examine the effects of Ramadan on daily criminal activities by estimating Equation 1. The first column of Table 2 presents the OLS coefficients, and the second column reports the PPML coefficients for several criminal offenses. We employ the PPML method because it is reliable and valid for many observations with zero values in the dependent variable.

The first row of the table indicates a statistically significant decline in daily homicides, with a quantified decrease of 20.39%.[1] This result attains significance at the 1% level. The second row of Table 2 illustrates that Ramadan contributes to a 4.40% reduction in instances of assault crime. Furthermore, robbery crimes appear to be influenced by Ramadan, with this result reaching significance at the p = 0.01 level, reflecting an 11.75% decline. Additionally, Ramadan has been associated with decreases in daily theft crimes, property damage crimes, and ill-treatment crimes by 4.88%, 8.61%, and 5.07%, respectively.

This table is revealing in multiple respects. Notably, the elevated coefficient of daily traffic crimes captures attention, reflecting a substantial decline of 47.69%. This coefficient holds statistical significance and exceeds those of other crime categories represented within the table. Furthermore, a particularly intriguing aspect of the analysis concerns drug use and sales. Although there is no significant evidence to suggest that Ramadan influences drug

[1] We use the formula $(e^{\beta} - 1) * 100$, where β is the estimated coefficient, to calculate the coefficients for PPML estimates.

use, there is suggestive evidence indicating a negative correlation between Ramadan and drug sales. A possible explanation for this phenomenon may be that drug use is associated with addiction, and Ramadan itself does not significantly influence this behavior.

Insert Table 2

The results substantiate the assertions made by Birkholz and Gomtsyan (2023), who indicated that Ramadan contributes to a decrease in violent and property crimes perpetrated by Muslim migrants in Switzerland. Additionally, this finding aligns with the broader conclusions of other research in the field, which associates Ramadan with a reduction in criminal activities (Datta & Mohammed, 2024; Reese et al., 2017). Taken together, these results suggest that Ramadan plays a significant role in reducing various types of crimes except for substance-related crimes. These findings are of considerable importance to the literature and public policy debate. In the next section, we will examine several mechanisms that can help elucidate these findings and inform policymaking.

3.2. Social gatherings

This section explores the potential mechanism that can drive our main findings above. During Ramadan, Muslims come together to break their fast (*iftar*). Unlike other Muslims in Western countries, Turkish Muslims are accustomed to inviting their families and friends to their homes to break their fast together in a family environment. Inviting others to break their fast with them requires many tasks before iftar, as the inviting family prepares the food and everything for the iftar time, thereby reducing the time that could be allocated to criminal activities.

Insert Table 3

We test this hypothesis by exploiting the COVID-19 shutdowns in 2020 and 2021. In 2020, Ramadan started on 24 April and ended on 23 May; in 2021, it started on 13 April and ended on 12 May, which overlaps with the COVID-19 shutdowns. If the explanation above is valid, we would expect a much smaller impact of Ramadan on crime rates during the COVID-19 shutdowns, as people cannot invite their families or friends over to break their fast.

Consequently, they will not engage in any preparations for iftar, allowing them more time to spend on criminal activities.

Table 3 presents the results obtained from analyzing this mechanism. The findings in the second column illustrate a statistically significant and substantial decline in nearly all crime rates. For instance, Ramadan emerges as a significant contributing factor to the reduction in homicide crimes, with its effect being approximately 1.6 times greater than the corresponding coefficient detailed in Table 2. Consequently, we can assert with confidence that several alternative channels elucidate the influence of Ramadan on crime rates, rather than attributing it solely to the social gatherings channel.

3.3. Physical activity

In this section, we investigate whether the diminished impact of Ramadan on crime rates can be ascribed to the extended duration of fasting. To clarify, by the conclusion of Ramadan, there may exist a cumulative effect of weariness, resulting in a decrease in criminal activity. To this end, we categorize the analysis into three segments: pre-Ramadan, Ramadan, and post-Ramadan, utilizing an event study-type framework. We present coefficient estimates based on 10-day intervals preceding and following Ramadan. Regarding the physical activity channel, we specifically highlight the Ramadan period.

During Ramadan, believers refrain from consuming food and beverages from pre-dawn until sunset, which may impair their physical capacity to engage in criminal activities. In the early days of Ramadan, people are not yet exhausted from fasting; however, as time passes, those who fast may face some difficulties with physical activity due to long days of fasting. If this is true, then we would expect to see higher declines in crime rates by the end of Ramadan, as committing a crime requires considerable planning and execution, which necessitates physical participation.

Insert Figure 2

Figure 2 illustrates the findings of our investigation into the correlation between reduced physical activity and total crime rates. Within this figure, three significant findings warrant

attention: firstly, we note a substantial reduction in crime rates on the inaugural day of Ramadan. Subsequently, as time progresses during Ramadan, the coefficients diminish, which contradicts the aforementioned mechanism of reduced physical activity. Lastly, during Laylat al-Qadr, a revered night commemorating the initiation of the Qur'an's revelation to the Prophet Muhammad (PBUH) – a night considered superior to a thousand months – we observe a notable decline in crime rates that is nearly equivalent to the corresponding estimate for the first ten days of Ramadan. Following this period, crime rates began to rise again. These findings provide further support for the hypothesis that shifts in beliefs and attitudes during Ramadan significantly contribute to a reduction in criminal behavior.

Upon conducting a detailed analysis of distinct crime rates, we identify a comparable trend across the majority of crime variables (see appendix figures 1-9). Notably, during the initial phase of Ramadan (i.e., the first ten days), there is a significant reduction, which is subsequently followed by an increase. In relation to Laylat al-Qadr, the magnitude of this decline is considerably greater than previously observed, after which an upward trend re-emerges. This observed pattern corroborates our argument that the enhancement of beliefs and attitudes plays a substantial role in the observed decrease in crime rates throughout Ramadan, rather than any alternative factors.

3.4. Mental readiness

Continuing with the results obtained by implementing the event-study design, Figure 2 displays pre-trends in crime rates. What we argue throughout the paper is that Ramadan plays a key role in influencing crime through a mechanism in which believers deepen their religious commitment and adjust their daily habits during the holy month. These changes may lead to behavioral modifications that reduce the likelihood of engaging in criminal activity.

Figure 2 illustrates a decline in overall crime rates prior to the observance of Ramadan, particularly during the month of Sha’ban. During this period, individuals appear to engage in mental preparation, which reinforces the argument presented above. Analyzing the interval

preceding Ramadan is of substantial significance, as it mitigates the influence of confounding factors, such as social gatherings, on crime rates, given that mental preparations predominantly occur individually throughout this month.

In essence, practitioners may observe fasting, initiate the recitation of the Qur'an, heighten their frequency of prayers, and engage in a variety of other religious activities independently. While these practices are encouraged during this period, they are not compulsory. Moreover, the findings derived from the event-study type analysis further substantiate our hypothesis regarding the observed reduction in criminal activity during Ramadan, attributable to individual-level transformations in beliefs and attitudes.

3.5. Persistence effects of Ramadan

This section of the paper addresses the persistence effects of Ramadan on crime rates. Figure 2 presents the post-Ramadan period concerning total crimes to provide insight into this analysis. Beginning with Eid al-Fitr, the diminished effect of Ramadan on crimes becomes statistically indistinguishable from zero during the first 23 days following the end of Ramadan. In other words, a vague effect of Ramadan on criminal activities is observed immediately following the conclusion of Ramadan. According to a hadith from Prophet Muhammad, during Ramadan, "...the gates of heavens are opened," and "...the gates of Hell are closed, and every devil is chained up" (An-Nasa'i, 2010, Hadith 2108). This narration appears consistent with our findings regarding Muslims' criminal activities during Ramadan in Türkiye. Nevertheless, once the holy month concludes, individuals must possess a heightened ability to resist temptation, as evil influences are no longer believed to be bound.

Another notable finding presented in Figure 2, pertaining to the enduring impact of Ramadan on crime rates, is associated with traffic offenses (see Appendix Figure 9). Traffic offenses exhibit a positive and statistically significant increase, indicating a significant correlation between Eid al-Fitr and traffic-related incidents. This observation aligns with anticipated trends, as individuals are inclined to travel during this period of the year, visiting family members and relatives both within their province and across the nation. This finding can be utilized to formulate targeted interventions aimed at mitigating traffic-related offenses

during the Eid al-Fitr travel period. Subsequently, traffic-related offenses seem to diminish, potentially indicating the enduring influence of Ramadan, which is not comparable in magnitude to the corresponding reductions observed during Ramadan.

A significant finding reveals a marked decrease in the incidence of ill-treatment-related crimes during the Eid al-Fitr period. The observed correlation between Eid al-Fitr and a reduction in such offenses can be attributed to the intrinsic link between this period and core Islamic teachings, which emphasize social cohesion, forgiveness, and positive interpersonal conduct. Specifically, the Prophet Muhammad (PBUH) stated:

"Beware of suspicion, for suspicion is the worst of false tales; and do not look for the others' faults and do not spy, and do not be jealous of one another, and do not desert (cut your relation with) one another, and do not hate one another; and O Allah's worshipers! Be brothers (as Allah has ordered you!)" (Al-Bukhārī, 1995b, Hadith 6064).

This profound Hadith directly addresses behaviors that could precipitate ill-treatment-related crimes, such as suspicion, fault-finding, spying, jealousy, ostracism, and hatred. The collective spirit of Eid al-Fitr, characterized by communal prayers, family visits, charitable acts (e.g., Zakat al-Fitr), and general expressions of joy and gratitude, strongly reinforces these prophetic injunctions. Muslims are encouraged to reconcile differences, strengthen familial and social bonds, and extend kindness to all. This widespread adherence to Islamic ethical principles during Eid fosters an environment of mutual respect and harmony, thereby contributing to a measurable reduction in crimes associated with negative social interactions and ill-treatment.

4. Robustness results

In this subsection, we further investigate whether the diminished impact of Ramadan on crime rates is attributed to regions where religiosity holds considerable significance. Nişancı (2023) reports that the prevalence of regular fasting is lowest in these regions, namely the Aegean (53%), Mediterranean (61%), and Western Marmara (62%). Consequently, we include only these regions in our analysis and estimate Equation (1) for robustness

examination. In his study, Nişancı (2023) inquires with survey participants regarding the frequency of fasting during Ramadan, with regular fasting defined as individuals who report fasting “often” or “always.”

Insert Table 4

The coefficient estimates presented in Table 4 provide robust evidence of Ramadan's influence on crime rates, even within those subregions where regular fasting is minimal. For example, Ramadan is an important factor in reducing crimes related to property damage by 11.49%. These findings suggest that Ramadan serves as a substantial contributing factor to the observed reduction in criminal activity, and the ethos and tranquility associated with the month of Ramadan permeate the nation, regardless of individuals' participation in fasting.

Perhaps the most interesting finding is that when limited to these regions, crimes regarding drug use and drug sales become statistically significant and positive. This outcome could be attributed to the predominance of Ramadan dates within the summer period, leading to an influx of tourists who may contribute to an increase in certain crimes during this month. During these times, the fasting population constitutes a smaller proportion of the domestic population. Research suggests that tourists often believe their status provides immunity from local law enforcement, who may tolerate drug use to preserve tourism benefits (Uriely & Belhassen, 2006). In contrast, law enforcement officers observing Ramadan may exhibit heightened attention to crimes involving substances considered illicit. Given that regions with a smaller share of fasting individuals are also prominent tourism destinations in Türkiye, drug-using tourists may gravitate towards environments offering intense entertainment, such as festivals and parties. This, in turn, can encourage further drug consumption (Bingöl, 2022) and lead to an increased drug supply to meet rising demand. This mechanism also accounts for a decrease in other criminal activities, as individuals detained for drug-related offenses may have less opportunity to commit additional crimes, particularly those influenced by substance intoxication.

5. Conclusion

Ramadan holds considerable significance for Muslim communities worldwide. This distinguished month, during which Muslims observe fasting, partake in communal meals, engage in prayer, and participate in numerous social activities, embodies a period of fasting characterized by mercy at its commencement, forgiveness at its midpoint, and salvation from the torments of hell at its conclusion (al-Bayhaqi, *Shu'ab al-Iman*, vol. 5, p. 223). Moreover, Ramadan offers numerous advantages for both believers and society at large, one of which pertains to the observed decrease in criminal activity during its duration.

Research suggests that Ramadan may be associated with a decrease in criminal activity, and several mechanisms have been proposed to explain this potential reduction. These include the influence of religious belief and increased piety, the potential accumulation of social capital among Muslims through heightened community engagement, and a potential increase in patience, empathy, or a reduction in aggressive tendencies.

The present study was designed to determine the effect of Ramadan on various types of crime, utilizing the universal daily criminal records provided by the Ministry of Justice of Türkiye on a provincial basis. The secondary objective of this study was to investigate the potential channels that may elucidate our primary findings, including social gatherings, physical ability, and mental preparedness.

This study has demonstrated that Ramadan exerts a significantly diminished impact on various crime types in Türkiye, with the exception of drug use and sales. Additionally, the research has revealed that one of the probable mechanisms explaining these findings, specifically social gatherings, does not account for the observed reduction in crime rates during Ramadan. Another crucial finding indicates that the mechanism of physical inability fails to elucidate our primary results. A noteworthy conclusion emerging from this study is that the transformation in believers' religious commitment and behavior drives our main conclusions.

When considered collectively, these findings suggest a potential role for Ramadan in promoting a safer society, characterized by reduced crime rates to some extent. These findings have substantial implications for understanding how religious practices may impact the well-being of society. The insights gained from this study could be beneficial to policymakers seeking to maintain a secure and stable societal environment. Furthermore, the findings presented herein illuminate the relationship between Ramadan and substance-related crimes, for which we observe no significant correlation. These findings will be pertinent to policymakers in addressing and devising strategies to mitigate the effects of such crimes within society.

A limitation of this study is that our dataset solely encompasses the period from March to September in the years 2010 to 2023. Consequently, we primarily lack data for the winter months. Therefore, we are unable to account for any seasonal effects that may be associated with criminal activity. Notwithstanding its limitations, the study makes a significant contribution to our understanding of the complex interplay between emotional states, behavioral patterns, and cultural contexts, particularly in relation to the relationship between Ramadan fasting and crime rates.

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Figures

Figure 1. Judicial System in Türkiye

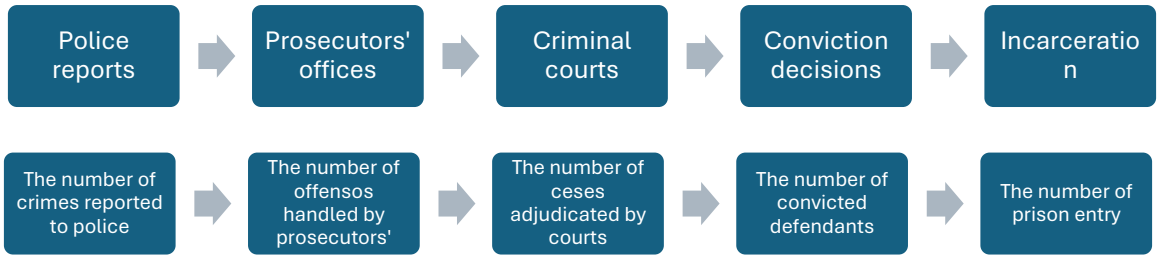
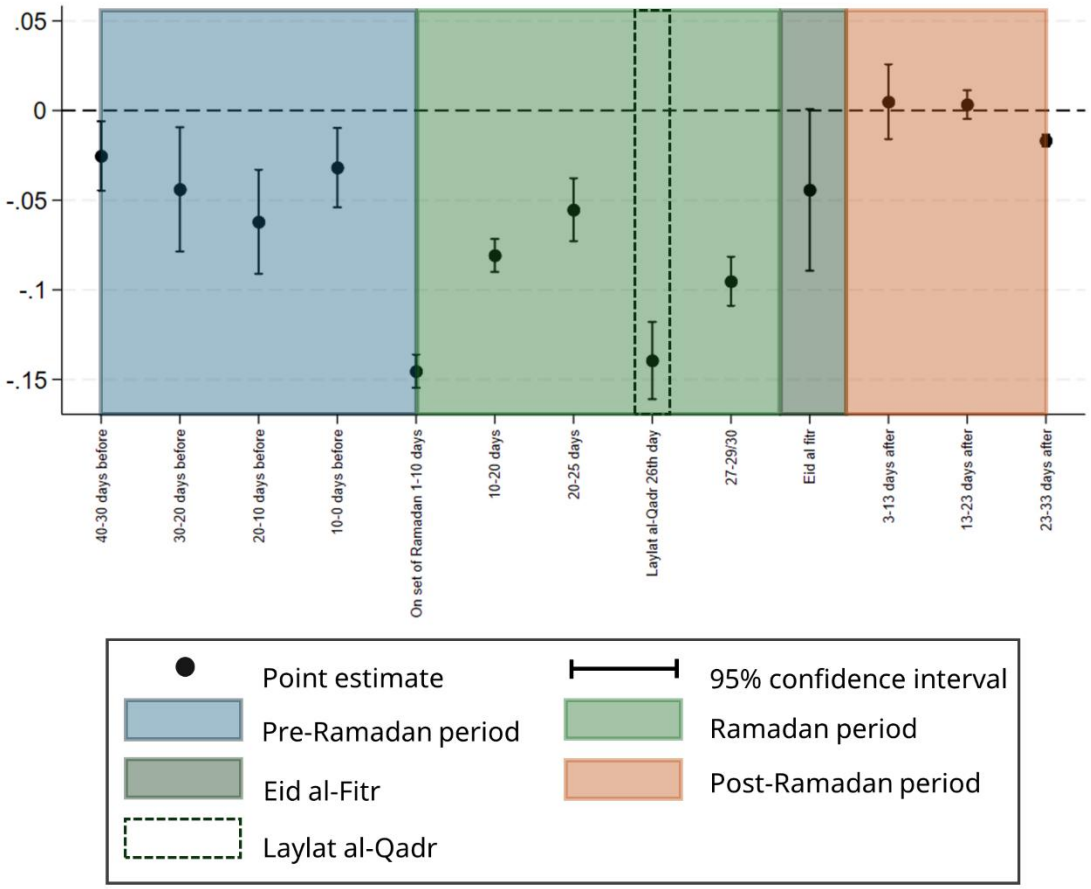


Figure 2. Estimated Impact of Ramadan on Daily Crime Rates



Notes: This figure displays coefficients obtained from a (PPML) estimation of Equation (1). The dependent variable in the regression is the daily total crime occurrences across all 81 cities in Türkiye. The horizontal axis represents different periods relative to Ramadan, segmented into 10-day intervals. Each point on the axis, with the exception of Laylat al-Qadr and Eid al-Fitr, corresponds to a coefficient estimate for that specific 10-day period. Laylat al-Qadr specifically divides the 20-29/30 day bin. The bin for Eid al-Fitr is also presented separately. Due to the varying length of Ramadan across different years (either 29 or 30 days), the label "27-29/30" on the horizontal axis accounts for this variation.

Tables

Table 1. Descriptive Statistics

	Mean	SD	Min	Max	Observation
Homicide	0.616	0.883	0	4.478	395604
Assault	3.893	1.265	0	6.346	395604
Theft	3.082	1.542	0	6.288	395604
Robbery	1.357	1.281	0	4.820	395604
Damage to property	2.891	1.336	0	5.930	395604
Ill-treatment	0.482	0.764	0	3.690	395604
Drug use	2.762	1.857	0	6.646	395604
Drug sales	1.550	1.392	0	5.464	395604
Traffic	2.473	1.498	0	6.087	395604
Ramadan	0.084	0.277	0	1	395604

Notes: Our dataset comprises daily records of criminal activity across 81 provinces of Türkiye, spanning from January 1, 2010, to May 31, 2023. Each crime variable is normalized to represent the number of cases per 100,000 individuals. We excluded observations recorded on 1 July of each year from 2010 to 2022, specifically those on 15 and 16 July 2016. We use monthly population numbers as weights.

Table 2: Criminal offenses during Ramadan

	(1)	(2)
Estimation method	OLS	PPML
Dependent variable: Homicide		
Ramadan	-0.107***	-0.228***
	(0.032)	(0.016)
Dependent variable: Assault		
Ramadan	-0.033***	-0.045***
	(0.011)	(0.010)
Dependent variable: Robbery		
Ramadan	-0.096***	-0.125***
	(0.015)	(0.006)
Dependent variable: Theft		
Ramadan	-0.036***	-0.050***
	(0.006)	(0.007)
Dependent variable: Damage to property		
Ramadan	-0.088***	-0.090***
	(0.009)	(0.009)
Dependent variable: Ill treatment		
Ramadan	-0.019***	-0.052***
	(0.005)	(0.009)
Dependent variable: Traffic		
Ramadan	-0.547***	-0.648***
	(0.045)	(0.093)
Dependent variable: Drug use		
Ramadan	0.001	0.000
	(0.010)	(0.008)
Dependent variable: Drug sales		
Ramadan	-0.001	-0.052*
	(0.018)	(0.029)
N	395604	395604
Day of month FE	Yes	Yes
Month FE	Yes	Yes
Year FE	Yes	Yes
Province FE	Yes	Yes

Notes: Our dependent variables are rates per 100,000 population, covering daily records of criminal activity across 81 provinces of Türkiye between January 1, 2010, and May 31, 2023. We transform dependent variables in column 1 by using the inverse hyperbolic sine transformation to account for the right-skewed distribution in the dependent variable. We employ the PPML method in the second column to account for many zeros in our dependent variables. We excluded observations recorded on 1 July of each year from 2010 to 2022, specifically those on 15 and 16 July 2016. All regressions include day of month, month, year, and province fixed effects. We use monthly population numbers as weights in all regressions. Standard errors are in parentheses and clustered at the province level. * $p < .1$, ** $p < .05$, *** $p < .01$.

Table 3: Criminal offenses during Ramadan: Social Gatherings

	(1)	(2)
Estimation method	OLS	PPML
Dependent variable: Homicide		
Ramadan	-0.137***	-0.369***
	(0.041)	(0.051)
Dependent variable: Assault		
Ramadan	-0.052***	-0.055***
	(0.014)	(0.015)
Dependent variable: Robbery		
Ramadan	-0.062***	-0.022
	(0.021)	(0.027)
Dependent variable: Theft		
Ramadan	-0.050***	-0.079***
	(0.017)	(0.014)
Dependent variable: Damage to property		
Ramadan	-0.124***	-0.117***
	(0.013)	(0.009)
Dependent variable: Ill-treatment		
Ramadan	-0.032	-0.230***
	(0.025)	(0.054)
Dependent variable: Traffic		
Ramadan	-0.798***	-0.901***
	(0.067)	(0.095)
Dependent variable: Drug use		
Ramadan	-0.030*	-0.076***
	(0.017)	(0.011)
Dependent variable: Drug sale		
Ramadan	-0.021	-0.078***
	(0.023)	(0.013)
N	59049	59049
Day of month FE	Yes	Yes
Month FE	Yes	Yes
Year FE	Yes	Yes
Province FE	Yes	Yes

Notes: Our dependent variables are rates per 100,000 population, covering daily records of criminal activity across 81 provinces of Türkiye between January 1, 2010, and May 31, 2023. We transform dependent variables in column 1 by using the inverse hyperbolic sine transformation to account for the right-skewed distribution in the dependent variable. We employ the PPML method in the second column to account for many zeros in our dependent variables. We excluded observations recorded on 1 July of each year from 2010 to 2022, specifically those on 15 and 16 July 2016. For "Ill-treatment," there is a difference in columns 1 and 2 in the number of observations due to the PPML estimation dropping 729 observations from the sample that are fully separated by the fixed effects. All regressions include day of month, month, year, and province fixed effects. We use monthly population numbers as weights in all regressions. Standard errors are in parentheses and clustered at the province level. * $p < .1$, ** $p < .05$, *** $p < .01$.

Table 4: Criminal Offenses During Ramadan, Including Regions with the Lowest Frequency of Regular Fasting

	(1)	(2)
Estimation method	OLS	PPML
Dependent variable: Homicide		
Ramadan	-0.076***	-0.216***
	(0.017)	(0.036)
Dependent variable: Assault		
Ramadan	-0.098***	-0.113***
	(0.015)	(0.014)
Dependent variable: Robbery		
Ramadan	-0.079***	-0.111***
	(0.011)	(0.019)
Dependent variable: Theft		
Ramadan	-0.025**	-0.026**
	(0.010)	(0.011)
Dependent variable: Damage to property		
Ramadan	-0.116***	-0.122***
	(0.011)	(0.008)
Dependent variable: Bad treatment		
Ramadan	-0.014**	-0.048***
	(0.005)	(0.010)
Dependent variable: Traffic		
Ramadan	-0.536***	-0.568***
	(0.030)	(0.043)
Dependent variable: Drug use		
Ramadan	0.033*	0.042***
	(0.017)	(0.009)
Dependent variable: Drug sales		
Ramadan	0.037**	0.046**
	(0.015)	(0.021)
N	102564	102564
Day of month FE	Yes	Yes
Month FE	Yes	Yes
Year FE	Yes	Yes
Province FE	Yes	Yes

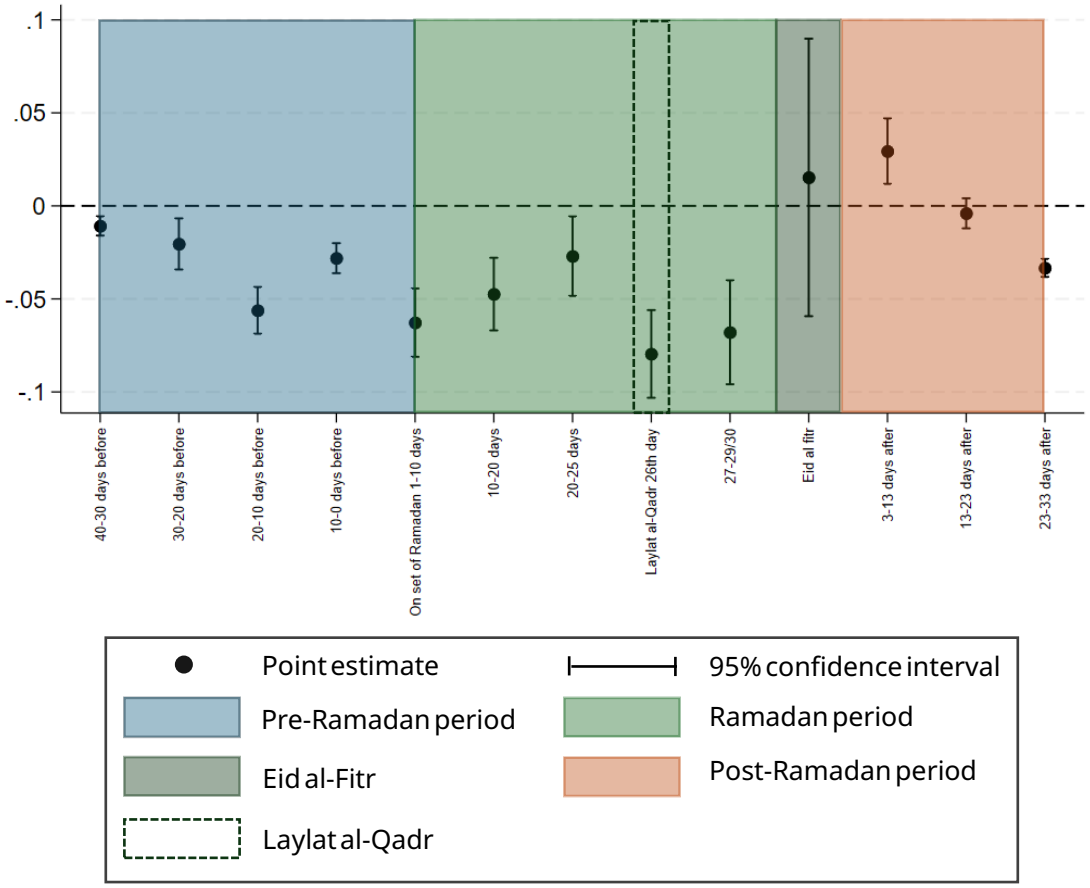
Notes: Our dependent variables are rates per 100,000 population, covering daily records of criminal activity across 81 provinces of Türkiye between January 1, 2010, and May 31, 2023. We transform dependent variables in column 1 by using the inverse hyperbolic sine transformation to account for the right-skewed distribution in the dependent variable. We employ the PPML method in the second column to account for many zeros in our dependent variables. We excluded observations recorded on 1 July of each year from 2010 to 2022, specifically those on 15 and 16 July 2016. We include only those regions in the regression analysis where the frequency of regular fasting is lowest, such as the Aegean (53%), Mediterranean (61%), and Western Marmara (62%). All regressions include day of month, month, year, and province fixed effects. We use monthly population numbers as weights in all regressions. Standard errors are in parentheses and clustered at the province level. * $p < .1$, ** $p < .05$, *** $p < .01$.

Appendix

Table 1. Classification of Criminal Offenses and Corresponding Penalties with Aggravating Circumstances

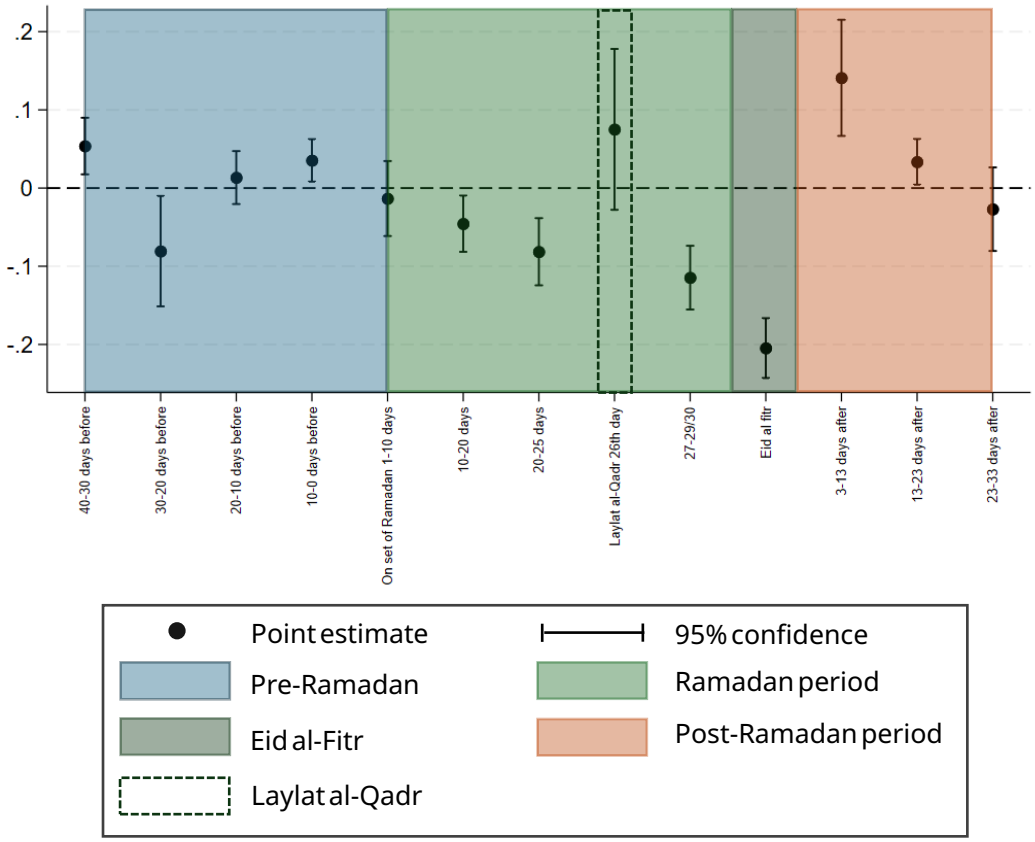
Crime Type	Description	Penalty	Aggravating Circumstances (Examples)
Homicide	Intentionally killing another person.	Life imprisonment.	Aggravated life imprisonment if committed with premeditation, cruelty, against child, spouse, etc.
Assault	Intentionally causing physical pain or health impairment.	1–3 years imprisonment.	Harsher penalties possible depending on injury severity or use of a weapon.
Theft	Illegally appropriating another's movable property for personal benefit.	1–3 years imprisonment.	3–12 years if in public institutions, with electronic systems, at disaster sites, etc.
Robbery	Taking property through violence or threats.	6–10 years imprisonment.	10–15 years if with weapon, at night, in homes/workplaces, by organized groups, etc.
Damage to Property	Destroying, damaging, rendering unusable another's property.	4 months–3 years or judicial fine (upon complaint).	1–4 years for damage to public property, with fire/explosives, or affecting public services.
Traffic Offences	Endangering others while operating a vehicle under unsafe conditions.	Up to 2 years imprisonment.	3 months–3 years for reckless acts in sea, air, or railway transport.
Ill-Treatment	Mistreatment of someone in the same household or under one's care.	2 months–1 year imprisonment.	Applies also to misuse of authority in education or caregiving roles.
Drug Selling	Producing, importing, exporting, selling, or distributing narcotics without a license.	20–30 years imprisonment + judicial fine up to 20,000 days.	Sentence increased if minors involved, near schools/hospitals, or committed by health professionals.
Drug Use/Possession	Buying, receiving, possessing or using drugs for personal use.	2–5 years imprisonment.	First-time offenders may get 5-year suspension, with probation and treatment.

Figure 1. Estimated Impact of Ramadan on Daily Assault Crime Rates



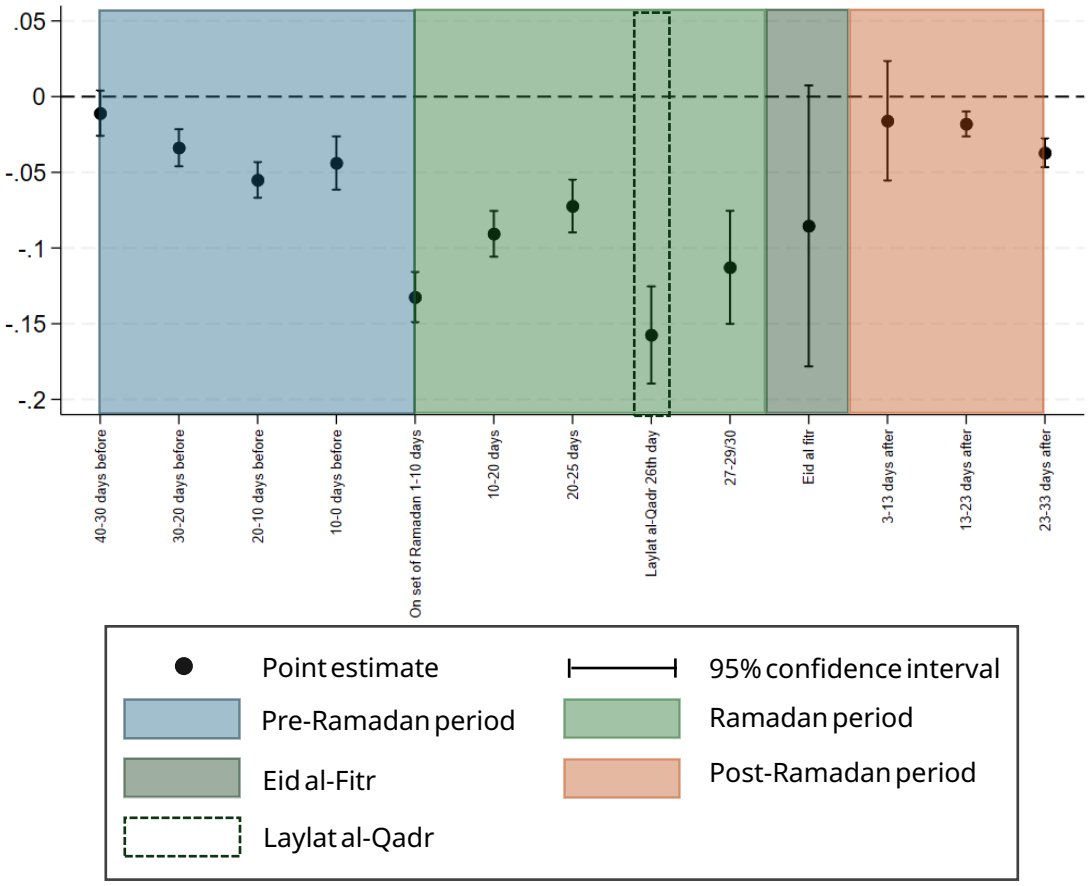
Notes: This figure displays coefficients obtained from a (PPML) estimation of Equation (1). The dependent variable in the regression is the daily assault crime occurrences across all 81 cities in Türkiye. The horizontal axis represents different periods relative to Ramadan, segmented into 10-day intervals. Each point on the axis, with the exception of Laylat al-Qadr and Eid al-Fitr, corresponds to a coefficient estimate for that specific 10-day period. Laylat al-Qadr specifically divides the 20-29/30 day bin. The bin for Eid al-Fitr is also presented separately. Due to the varying length of Ramadan across different years (either 29 or 30 days), the label "27-29/30" on the horizontal axis accounts for this variation.

Figure 2. Estimated Impact of Ramadan on Daily Ill-treatment Crime Rates



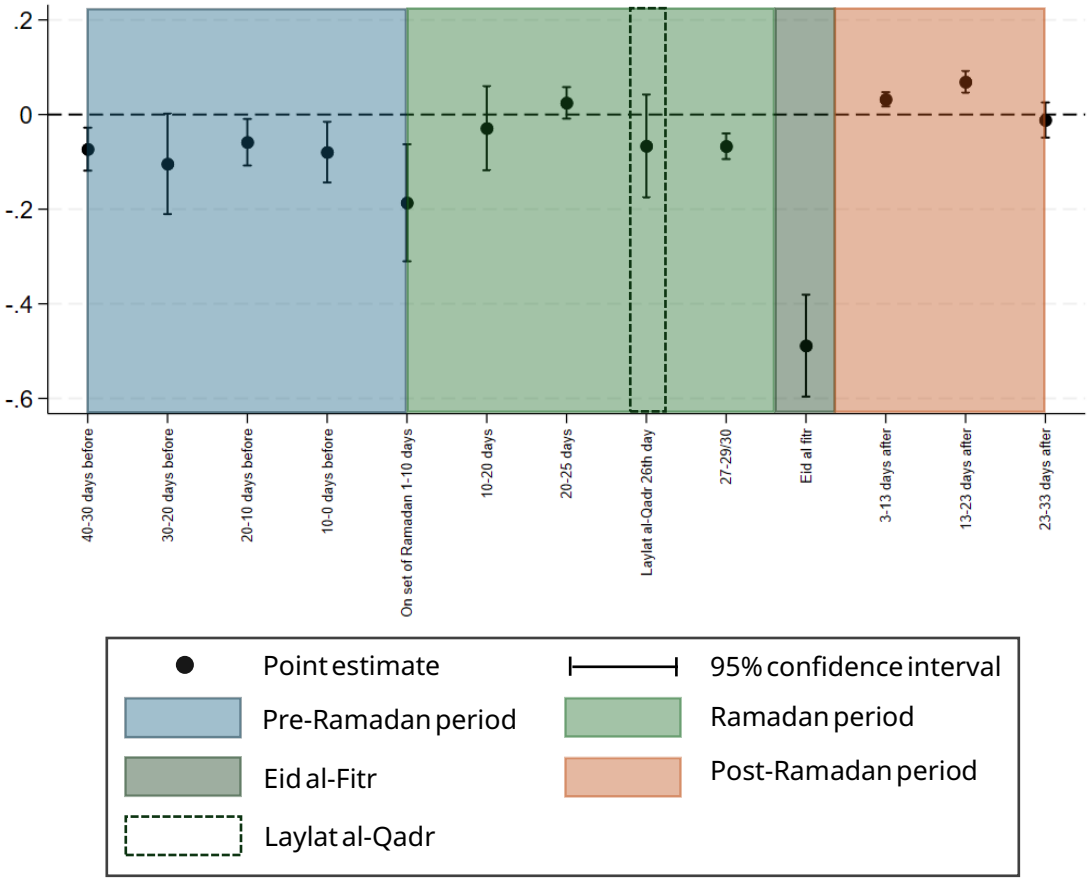
Notes: This figure displays coefficients obtained from a (PPML) estimation of Equation (1). The dependent variable in the regression is the daily Ill-treatment crime occurrences across all 81 cities in Türkiye. The horizontal axis represents different periods relative to Ramadan, segmented into 10-day intervals. Each point on the axis, with the exception of Laylat al-Qadr and Eid al-Fitr, corresponds to a coefficient estimate for that specific 10-day period. Laylat al-Qadr specifically divides the 20-29/30 day bin. The bin for Eid al-Fitr is also presented separately. Due to the varying length of Ramadan across different years (either 29 or 30 days), the label "27-29/30" on the horizontal axis accounts for this variation.

Figure 3. Estimated Impact of Ramadan on Daily Damage to Property Crime Rates



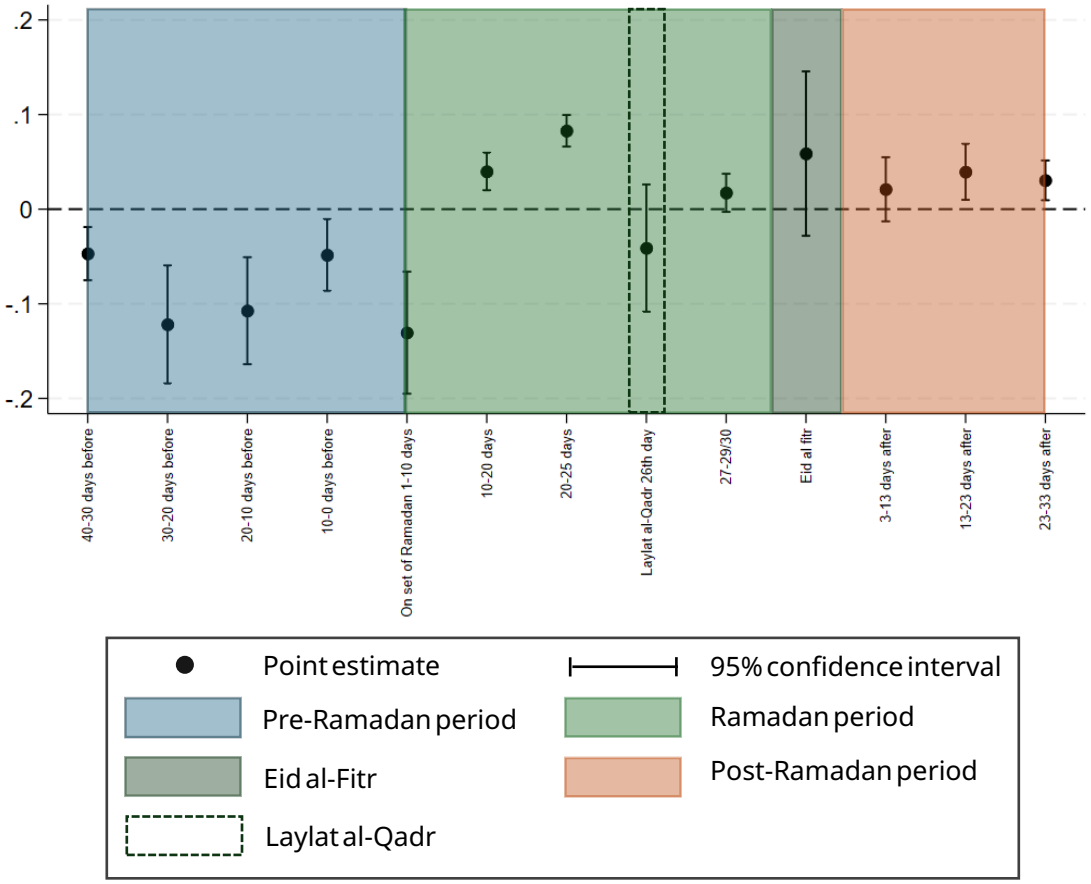
Notes: This figure displays coefficients obtained from a (PPML) estimation of Equation (1). The dependent variable in the regression is the daily damage to property crime occurrences across all 81 cities in Türkiye. The horizontal axis represents different periods relative to Ramadan, segmented into 10-day intervals. Each point on the axis, with the exception of Laylat al-Qadr and Eid al-Fitr, corresponds to a coefficient estimate for that specific 10-day period. Laylat al-Qadr specifically divides the 20-29/30 day bin. The bin for Eid al-Fitr is also presented separately. Due to the varying length of Ramadan across different years (either 29 or 30 days), the label "27-29/30" on the horizontal axis accounts for this variation.

Figure 4. Estimated Impact of Ramadan on Daily Drug Sell Crime Rates



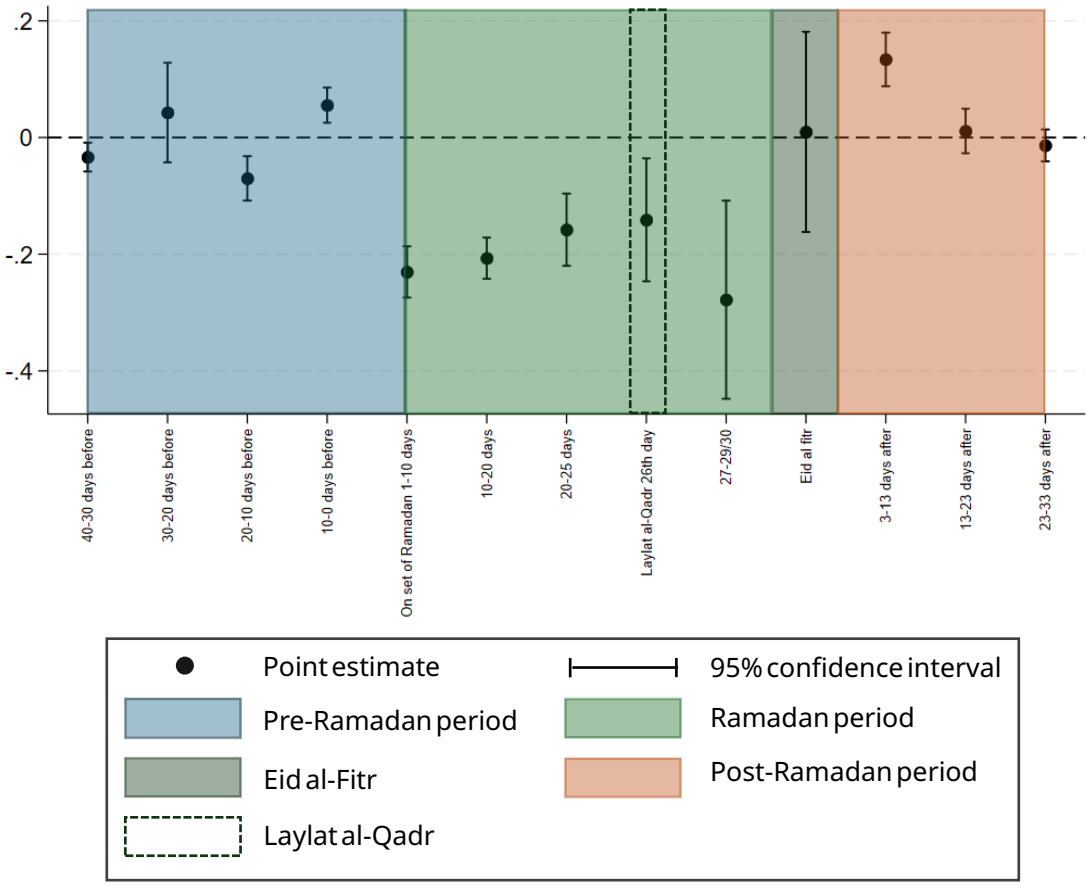
Notes: This figure displays coefficients obtained from a (PPML) estimation of Equation (1). The dependent variable in the regression is the daily drug sell crime occurrences across all 81 cities in Türkiye. The horizontal axis represents different periods relative to Ramadan, segmented into 10-day intervals. Each point on the axis, with the exception of Laylat al-Qadr and Eid al-Fitr, corresponds to a coefficient estimate for that specific 10-day period. Laylat al-Qadr specifically divides the 20-29/30 day bin. The bin for Eid al-Fitr is also presented separately. Due to the varying length of Ramadan across different years (either 29 or 30 days), the label "27-29/30" on the horizontal axis accounts for this variation.

Figure 5. Estimated Impact of Ramadan on Daily Drug Use Crime Rates



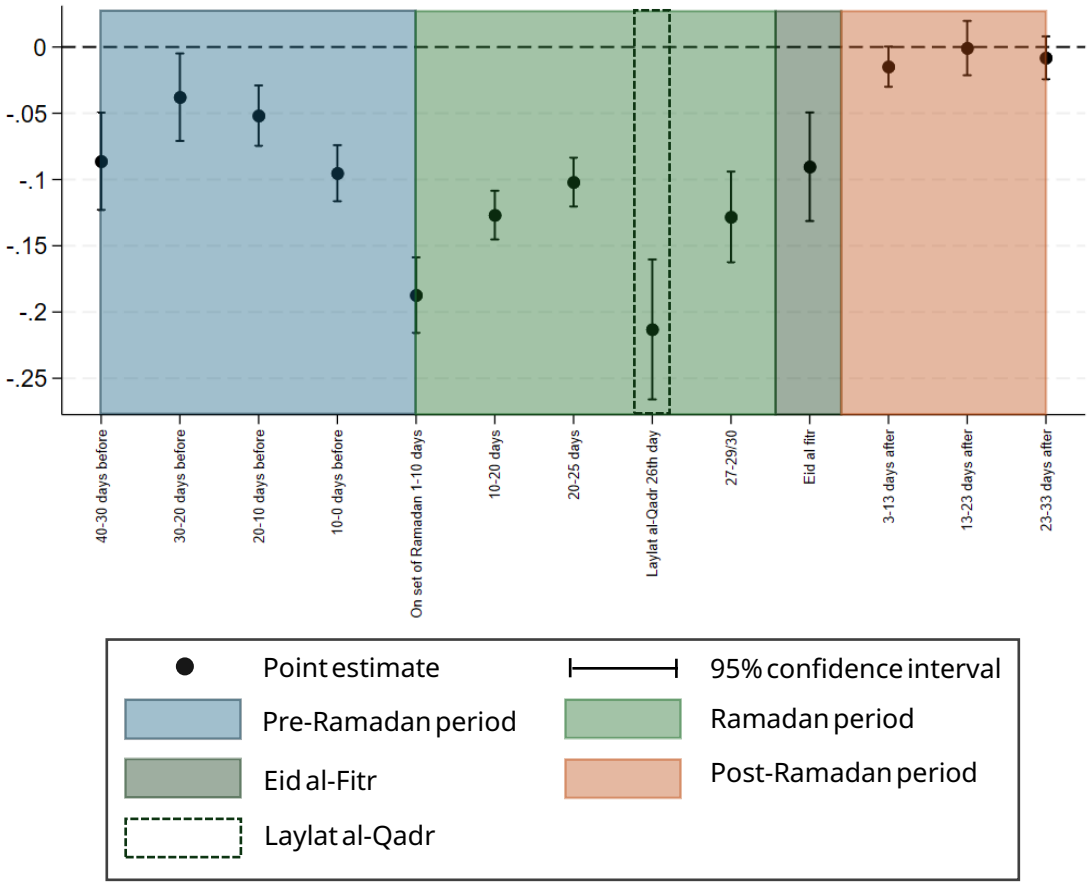
Notes: This figure displays coefficients obtained from a (PPML) estimation of Equation (1). The dependent variable in the regression is the daily drug use crime occurrences across all 81 cities in Türkiye. The horizontal axis represents different periods relative to Ramadan, segmented into 10-day intervals. Each point on the axis, with the exception of Laylat al-Qadr and Eid al-Fitr, corresponds to a coefficient estimate for that specific 10-day period. Laylat al-Qadr specifically divides the 20-29/30 day bin. The bin for Eid al-Fitr is also presented separately. Due to the varying length of Ramadan across different years (either 29 or 30 days), the label "27-29/30" on the horizontal axis accounts for this variation.

Figure 6. Estimated Impact of Ramadan on Daily Homicide Crime Rates



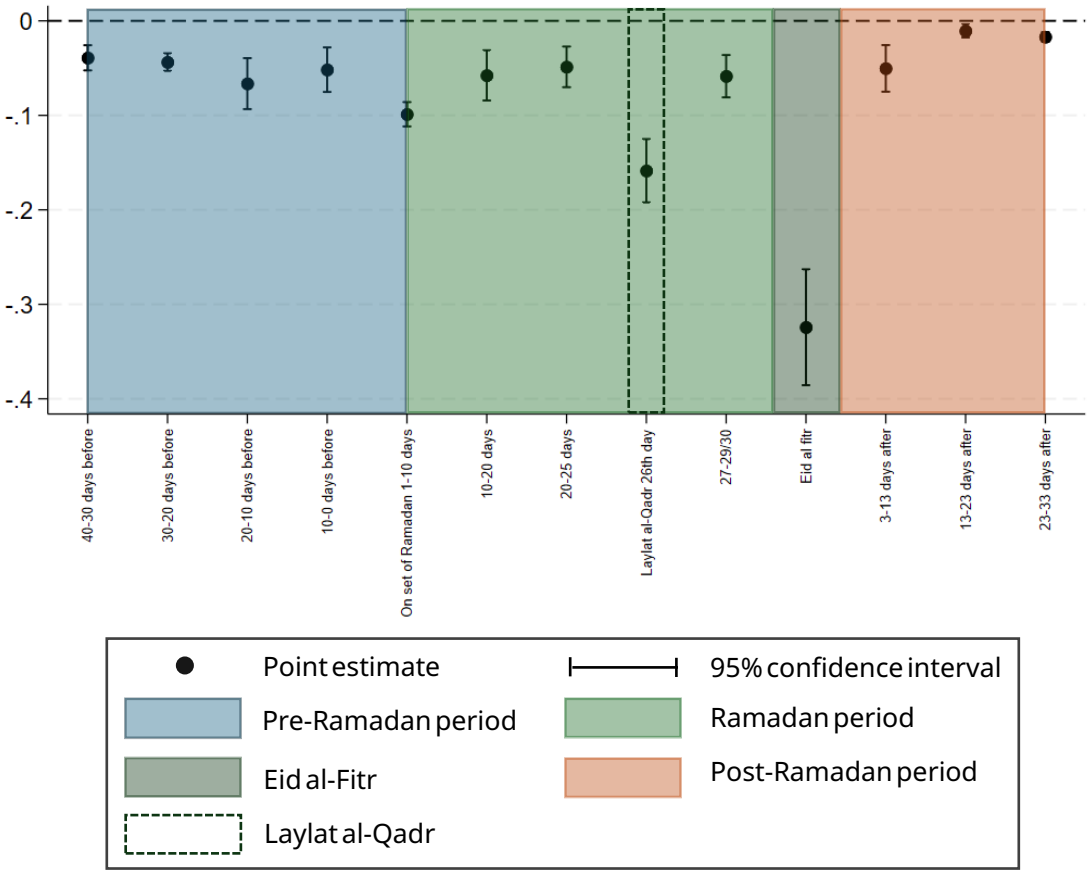
Notes: This figure displays coefficients obtained from a (PPML) estimation of Equation (1). The dependent variable in the regression is the daily homicide crime occurrences across all 81 cities in Türkiye. The horizontal axis represents different periods relative to Ramadan, segmented into 10-day intervals. Each point on the axis, with the exception of Laylat al-Qadr and Eid al-Fitr, corresponds to a coefficient estimate for that specific 10-day period. Laylat al-Qadr specifically divides the 20-29/30 day bin. The bin for Eid al-Fitr is also presented separately. Due to the varying length of Ramadan across different years (either 29 or 30 days), the label "27-29/30" on the horizontal axis accounts for this variation.

Figure 7. Estimated Impact of Ramadan on Daily Robbery Crime Rates



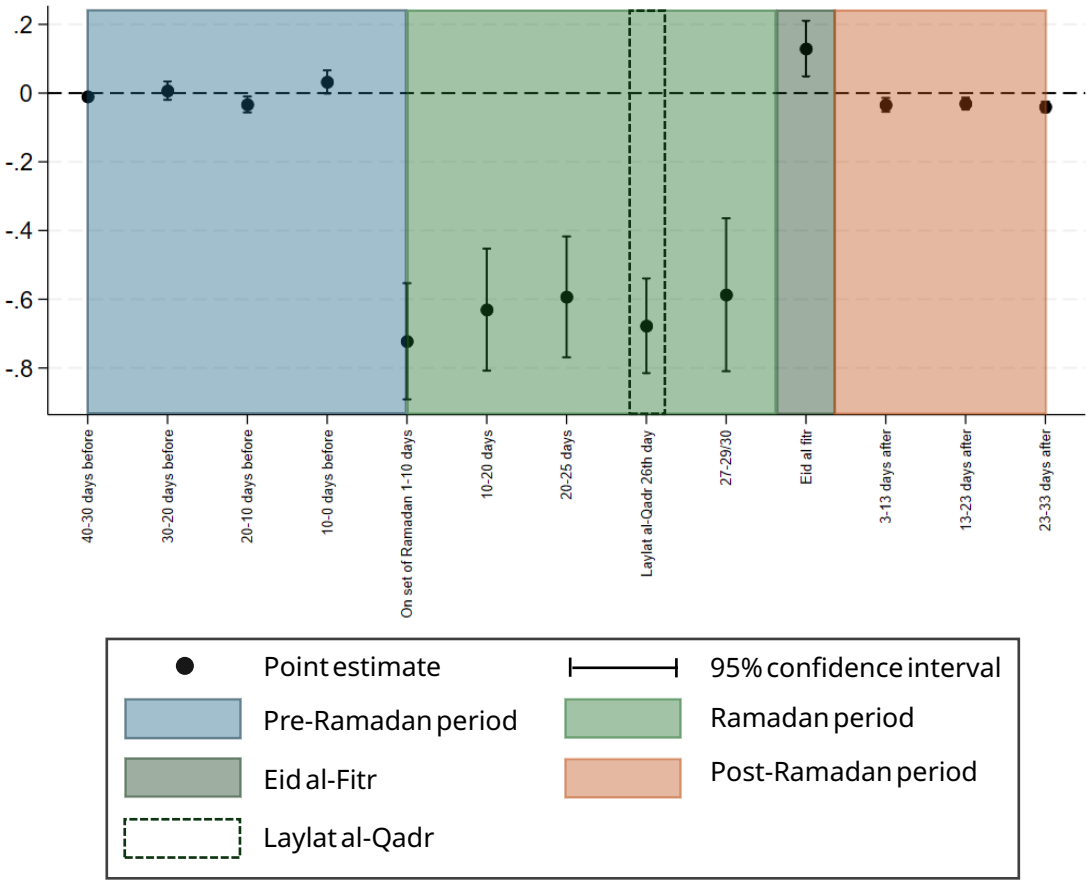
Notes: This figure displays coefficients obtained from a (PPML) estimation of Equation (1). The dependent variable in the regression is the daily robbery crime occurrences across all 81 cities in Türkiye. The horizontal axis represents different periods relative to Ramadan, segmented into 10-day intervals. Each point on the axis, with the exception of Laylat al-Qadr and Eid al-Fitr, corresponds to a coefficient estimate for that specific 10-day period. Laylat al-Qadr specifically divides the 20-29/30 day bin. The bin for Eid al-Fitr is also presented separately. Due to the varying length of Ramadan across different years (either 29 or 30 days), the label "27-29/30" on the horizontal axis accounts for this variation.

Figure 8. Estimated Impact of Ramadan on Daily Theft Crime Rates



Notes: This figure displays coefficients obtained from a (PPML) estimation of Equation (1). The dependent variable in the regression is the daily theft crime occurrences across all 81 cities in Türkiye. The horizontal axis represents different periods relative to Ramadan, segmented into 10-day intervals. Each point on the axis, with the exception of Laylat al-Qadr and Eid al-Fitr, corresponds to a coefficient estimate for that specific 10-day period. Laylat al-Qadr specifically divides the 20-29/30 day bin. The bin for Eid al-Fitr is also presented separately. Due to the varying length of Ramadan across different years (either 29 or 30 days), the label "27-29/30" on the horizontal axis accounts for this variation.

Figure 9. Estimated Impact of Ramadan on Daily Traffic Crime Rates



Notes: This figure displays coefficients obtained from a (PPML) estimation of Equation (1). The dependent variable in the regression is the daily traffic crime occurrences across all 81 cities in Türkiye. The horizontal axis represents different periods relative to Ramadan, segmented into 10-day intervals. Each point on the axis, with the exception of Laylat al-Qadr and Eid al-Fitr, corresponds to a coefficient estimate for that specific 10-day period. Laylat al-Qadr specifically divides the 20-29/30 day bin. The bin for Eid al-Fitr is also presented separately. Due to the varying length of Ramadan across different years (either 29 or 30 days), the label "27-29/30" on the horizontal axis accounts for this variation.