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***Araştırma Makalesi / Research Article***

# RELIGIOSITY AND WOMEN'S LEISURE-TIME PHYSICAL ACTIVITY IN TÜRKİYE: COUNTERVAILING ASSOCIATIONS OF RITUAL PRACTICE AND VEILING IN TWO NATIONAL SURVEYS

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**Abstract**
This study examines the association between religiosity and women's leisure-time physical activity in Türkiye, using two independent national samples. Its aim is to test whether treating religiosity as a single quantity is misleading. Data from the Türkiye Demographic and Health Survey and the Türkiye General Social Survey were analysed using logistic and ordinal logistic regression, with sampling weights and clustering applied where available. The findings show that dimensions of religiosity operate in opposite directions within a single model. In the Demographic and Health Survey data, ritual prayer frequency was positively associated with sport participation, while wearing a headscarf outside the home was negatively associated with it. The veiling coefficient was substantially larger for holidays and eating outside the home than for sport, indicating that the constraint attaches to public visibility rather than to sport-specific dress. In the General Social Survey data, religious literacy was positively associated with exercise frequency, and veiling was negatively associated with both exercise and walking. Self-rated religiosity showed no independent association in either survey. The results suggest that religiosity should enter health lifestyle theory not as a single positive force but as a dimensionally differentiated construct, and that single-item measures may understate its role.
**Keywords:** Religiosity, Physical activity, Women, Veiling, Health lifestyles
**JEL Codes:** Z12, I12, J16

# DİNDARLIK VE KADINLARIN BOŞ ZAMAN FİZİKSEL AKTİVİTESİ: İKİ ULUSAL ARAŞTIRMADA İBADET VE BAŞÖRTÜSÜ KULLANIMININ KARŞIT YÖNLÜ İLİŞKİLERİ

**Öz**
Bu çalışma, Türkiye'de kadınların boş zaman fiziksel aktivitesi ile dindarlık arasındaki ilişkiyi iki bağımsız ulusal örneklem üzerinden incelemektedir. Amaç, dindarlığın tek boyutlu bir büyüklük olarak ele alınmasının yanıltıcı olup olmadığını sınamaktır. Türkiye Nüfus ve Sağlık Araştırması ile Türkiye Genel Sosyal Saha Araştırması verileri, örneklem ağırlıkları ve küme etkileri elverdiği ölçüde dikkate alınarak lojistik ve sıralı lojistik regresyon modelleriyle çözümlenmiştir. Bulgular, dindarlığın farklı boyutlarının aynı model içinde zıt yönlerde işlediğini göstermektedir. Nüfus ve Sağlık Araştırması verilerinde namaz kılma sıklığı spor katılımıyla olumlu, dışarıda başörtüsü kullanımı ise olumsuz ilişkilidir. Başörtüsü kullanımına ilişkin katsayı, tatile çıkma ve dışarıda yemek yeme gibi kamusal etkinliklerde spora kıyasla belirgin biçimde daha büyüktür; bu örüntü, kısıtlamanın spora özgü kıyafet gerekliliklerinden çok kamusal görünürlükle bağlantılı olduğunu işaret etmektedir. Genel Sosyal Saha Araştırması verilerinde dinî okuryazarlık egzersiz sıklığıyla olumlu, başörtüsü kullanımı ise hem egzersiz hem yürüyüş sıklığıyla olumsuz ilişkilidir. Öznel dindarlık her iki araştırmada da bağımsız bir ilişki göstermemektedir. Sonuçlar, dindarlığın sağlık yaşam biçimleri kuramına tek bir olumlu güç olarak değil, boyutları farklılaşan bir yapı olarak dâhil edilmesi ve tek maddeli ölçümlere dayanan araştırmaların bu rolü olduğundan az gösterebileceğini düşündürmektedir.
**Anahtar Kelimeler:** Dindarlık, Fiziksel aktivite, Kadın, Başörtüsü, Sağlık yaşam biçimleri
**JEL Kodları:** Z12, I12, J16

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## Introduction

Physical inactivity is among the leading modifiable contributors to non-communicable disease worldwide, and its burden falls unevenly on women. Analysing World Health Survey data from 38 Muslim-majority countries, Kahan (2015, p. 73) reported that 62.5% of Turkish women were physically inactive against 49.5% of Turkish men. Both figures sit far above the 32.3% weighted average for the Muslim world as a whole, and the thirteen-point gender gap within Türkiye invites explanation. The explanation most readily reached for is religion.

The appeal to religion is rarely accompanied by evidence. Where religion enters the literature on Muslim women's physical activity, it usually appears as a single undifferentiated quantity, and the mechanism is asserted rather than measured. The qualitative work is considerably more careful, but it has been slow to translate into quantitative tests, and in Türkiye such tests are almost absent. The gap matters beyond any single country, because health lifestyle theory has an unfilled slot in exactly this place. In setting out the theory, Cockerham (2005, p. 59) identified collectivities, including religion, as one of four categories of structural variable shaping health lifestyles. He expected highly religious people to display more positive health lifestyles, on the grounds that belief shapes diet and discourages harmful practices. He then observed that the full extent of the relationship between religiosity and health lifestyles remains unknown for want of relevant studies. Two decades later the observation above still holds.

There is also a measurement question with reach well beyond the substantive one. Religiosity may be a configuration whose components carry opposing associations. If it is, the large body of research measuring religion with a single item, most often self-rated religiosity, may be systematically understating its role. Averaging components which cancel produces a coefficient close to zero. The risk is visible in the measurement literature itself. Taş et al. (2020, p. 736) built an instrument for the sport domain which separates a motivational subdimension from a clothing subdimension, and Kahan (2019, p. 3) reports that qualitative studies of Muslim women's activity routinely identify facilitators and barriers operating at the same time. A single summary score cannot represent either pattern. Establishing whether this occurs is therefore a methodological result which travels to any setting where religion and health behaviour are studied together.

Türkiye is an unusually informative case for both questions, for four reasons. The first is institutional. Türkiye combines an overwhelmingly Muslim population with a constitutionally secular state, a configuration shared by few other Muslim-majority countries. Nearly a century of state-led secularisation was followed, from the 1980s onward, by a marked return of religion to public life. Çarkoğlu and Kalaycıoğlu (2009, pp. 76-77) trace this return through the headscarf question, which moved from the margins of political argument to its centre within a single decade. Religiosity in Türkiye is therefore neither state-enforced nor socially marginal, and its variation across individuals is genuine rather than compressed by law or by social sanction in either direction. Countries where religious observance is legally mandated or effectively universal cannot support this kind of analysis, because the explanatory variable barely varies.

The second reason concerns the visibility of the constructs. In most settings, private devotion and public religious expression are difficult to separate empirically because they travel together and are measured together. In Türkiye they have been prised apart by political history. Çarkoğlu and Kalaycıoğlu (2009, pp. 76-77) document how the headscarf moved to the centre of Turkish political argument from the 1990s, becoming the object of legislation, litigation, and sustained public contention to a degree that overwhelmed broader discussion of women's rights. Their account matters for the present design because it establishes that the two constructs became publicly separable in Türkiye: the headscarf acquired a legal and electoral significance which prayer frequency never acquired, and was contested through legislation and litigation rather than through private disapproval. A woman's decision to cover her head in public in Türkiye is thus

legible in a way her prayer routine is not. This makes Türkiye the setting in which the analytic distinction at the heart of this study, between devotional practice and public religious expression, is sharpest and most measurable.

The third reason is the magnitude of the outcome itself. Turkish women are inactive at rates high even by the standards of Muslim-majority countries, so the behaviour under study has both substantial variance and real public health weight. Domestic survey evidence points the same way: in a sample of women aged 20 and over, Kitiş and Gümüş (2015, p. 399) found that 56.6% recorded only light physical activity on the short form of the International Physical Activity Questionnaire, and that 72.5% were at the stage of not contemplating exercise at all. Türkiye has also undergone rapid urbanisation and internal migration, producing the value conflict between metropolitan life and pre-urban socialisation that Çarkoğlu and Kalaycıoğlu identify as one source of control exerted over women's conduct and attire. The mechanisms of interest are therefore not residual features of the Turkish case but active ones.

The fourth reason is that much of the existing international literature on Muslim women and physical activity has been conducted on Turkish-origin populations in Europe without a domestic baseline. Pfister (2000, pp. 509-510) studied Turkish women in German sport; comparable work has examined Muslim women in Britain and Greece (Dagkas & Benn, 2006, p. 25) and in Norway (Walseth, 2006, p. 88). These studies interpret what they observe as the expression of religious and cultural norms carried from the country of origin, yet the country of origin has not itself been examined quantitatively on this question. Evidence from Türkiye supplies a reference point that this literature has lacked, and allows a check on whether patterns observed among migrant populations are continuous with those in the sending society or are artefacts of minority status.

This study takes up the question with an argument about measurement. Religiosity is not a quantity but a configuration, and its components need not point the same way. A woman who prays five times daily and a woman who wears a headscarf whenever she leaves the house are both religious, and both may be the same woman, but the first fact describes a devotional routine while the second describes a public appearance carrying social consequences that the first does not. If these components are averaged into an index, opposing associations cancel and the index returns something close to nothing. This, I suggest, is one reason the quantitative literature has found the relationship difficult to pin down.

The analysis draws on two independent national samples: the Türkiye Demographic and Health Survey of 2008 and the Türkiye General Social Survey of 2024. The surveys differ in population, instrumentation, and design, and they are analysed in parallel rather than pooled. What this approach costs in precision it repays in credibility, since a finding which survives two different instruments administered to two different populations sixteen years apart is more persuasive than a single coefficient from a pooled model whose measurement invariance cannot be established.

The paper makes three contributions. It provides what appears to be the first quantitative test of the religiosity and physical activity relationship on Turkish national data. It answers the research call embedded in the founding statement of health lifestyle theory, and qualifies the expectation on which the call rested. And it offers a design that discriminates between two mechanisms usually run together in this literature: whether religious constraint on women's activity operates through the specific demands of athletic dress, or through the more general regulation of women's presence in public space.

## 1. Theoretical Framework and Literature

### 1.1. Health Lifestyles, Agency, and Structure

Cockerham (2005, p. 55) defines health lifestyles as collective patterns of health-related behaviour based on choices from options available to people according to their life chances. The formulation

is Weberian: life choices stand for agency, life chances for structure, and the two work off each other to produce dispositions that Bourdieu termed habitus, which in turn generate practices. The theory's central corrective is against an individualist paradigm that treats health behaviour as a matter of personal decision and targets education at the individual, thereby neglecting the structural conditions that determine which choices are realistically available.

This framework suits the present problem for three reasons. First, it accommodates both the structural determinants that dominate these data, education and household resources above all, and the dispositional element through which religion plausibly operates. Second, it treats health behaviours as bundled rather than isolated, which licenses the comparison of sport with other leisure activities. Third, and most directly, it already contains religion as a structural variable under the heading of collectivities, defined as collections of actors linked through relationships such as kinship, work, religion, and politics, whose shared norms constitute perspectives beyond individual subjectivity.

Bourdieu's account of class barriers to leisure sport (Bourdieu, 1984, as cited in Cockerham, 2005, p. 56) is worth dwelling on. Alongside economic barriers, Bourdieu identified hidden entry requirements in the form of family tradition, obligatory dress and behaviour, and early socialisation. The argument here is that for women in a Muslim-majority setting, these non-economic entry requirements are gendered and religiously inflected rather than purely classed, yet the structure of the argument is the same: the barrier lies not in the activity but in the conditions of entry to it.

### 1.2. Religion as an Enabling Pathway

There is a substantial basis for expecting religiosity to promote rather than impede physical activity. Aboul-Enein (2016, p. 823) identified twenty-eight health-promoting verses in the Qur'an addressing diet and nutrition, personal hygiene, abstention from alcohol, and the importance of a healthy way of living, and argued that the text could serve as a medium for culturally competent health promotion. Kuşçuzade (2015, p. 398) documents the place of sport in the Prophetic example, including running, wrestling, archery, and swimming, and the recommendations attributed to the Prophet regarding these activities. Zaman (1997, p. 55) notes that the five daily prayers themselves constitute a prescribed routine of bodily movement.

Turkish quantitative work points the same way. Akgül and Kaplan (2017, p. 2396) examined the relationship between popular sport culture and religiosity across several subdimensions and reported positive associations, a result difficult to reconcile with a simple account of religion as a brake on physical activity. These two Turkish studies matter here for a reason beyond their findings. Both measure religiosity through subdimensions rather than a single score, and both were conducted on Turkish samples in the sport domain specifically. They establish, within the setting this study examines, that religiosity and sport are positively related when religiosity is allowed to vary across components. The present analysis extends this by asking whether the components also diverge in sign, which a subdimensional instrument permits but does not by itself test.

Taken alone, this literature predicts a uniformly positive association. The data below do not support that prediction, and the reason is not that the literature is wrong but that it describes only one of two pathways.

### 1.3. Religion as a Constraining Pathway

The second pathway operates not on movement but on visibility. Pfister (2000, p. 510), writing on Turkish women in German sport, locates the constraint not in doctrine but in a system of family prestige organised around honour, in which honour is anchored in the public conduct of women and female conduct is regulated through segregation and external sanction rather than through internalised norm. Walseth (2006, p. 88) shows young Muslim women's sporting participation

measured against a standard of respectable femininity, with transgression sanctioned informally through gossip. Dagkas and Benn (2006, p. 25), comparing Greece and Britain, found young Muslim women holding positive attitudes toward physical activity while negotiating dress codes, gender segregation, and the scheduling of Ramadan. Thorpe, Ahmad, Marfell, and Richards (2020, pp. 13-16) document the material dimension of this: women-only sessions scheduled at unusable hours, hostility from other facility users, and providers unwilling to accommodate.

The Turkish political context sharpens the point. Çarkoğlu and Kalaycıoğlu (2009, pp. 76-77) describe how the contest over public religious visibility came to dominate Turkish political debate from the 1990s onward, with the headscarf at the centre of legislation, litigation, and public argument to the extent that it overwhelmed broader discussion of women's rights. They also observe (p. 57) that rapid urban transformation generated value conflict with the pre-urban socialisation of older family members, one consequence of which is control exerted over women's attire. Veiling in Türkiye is therefore not simply a devotional act; it is a publicly legible marker in a contested field.

### 1.4. Beyond the Binary

Neither pathway alone is adequate, and a constraint-only account is the more common error. Zaman (1997, p. 54) warned that overemphasis on the constraints acting upon Muslim women, at the expense of understanding their own perceptions of health and wellbeing, produces an impoverished conception of the field. Kahan's (2019, p. 3) critical appraisal of the qualitative evidence base, and the findings of Calderon Pacheco (2015, p. 56) among Muslim women in Southern California, both show modesty being negotiated rather than simply obeyed. Jiwani and Rail (2010, p. 251) document young Shia Muslim Canadian women constructing physical activity as compatible with Islam and the hijab. Deeb and Harb (2013, p. 27) demonstrate for Shi'i south Beirut that pious leisure is neither a contradiction nor an accident but an actively produced market and moral geography.

The measurement implication is that religiosity must be modelled as a multidimensional construct. The claim is not novel in the sociology of religion, where separating belief, practice, experience, and knowledge is long-standing practice. What matters more here is that the point has already been demonstrated within the sport domain specifically, and on Turkish samples. Taş et al. (2020, p. 736), developing the Islamic Religion's Impact on Sport Activities Scale, recovered subdimensions that include motivation alongside clothing and interaction with the opposite sex. An instrument that separates a motivational channel from a clothing channel is itself an argument that these channels need not point the same way.

A fifth component must be added to the classical dimensional model. Visible religious expression is not a higher score on private devotion; it is a public marker with its own social consequences, and it should be modelled separately rather than folded into an index.

### 1.5. Expectations

Expectations are stated here as theoretically derived rather than pre-registered. The analyses reported below were conducted before this framework was written in its present form, and the study is best described as exploratory. All specifications estimated are reported, including those that fail, and the text flags throughout where a result depends on measurement decisions.

The first expectation is that dimensions of religiosity will not share a common sign, such that a unidimensional index would return an attenuated or null coefficient masking offsetting components. Second, ritual devotional practice is expected to be positively associated with activity once veiling and socioeconomic position are controlled. Third, veiling is expected to be negatively associated with activity, and further, if the mechanism is public visibility rather than athletic dress, the veiling coefficient will be at least as large for non-sport public leisure as for sport. Fourth,

bivariate associations are expected to attenuate substantially once education and household resources enter the model.

## 2. Data and Methods

### 2.1. Data Sources

The Türkiye Demographic and Health Survey of 2008 (TDHS 2008) interviewed 7,405 ever-married women aged 15 to 49 in a stratified multistage cluster sample comprising 628 primary sampling units. The recreation and religiosity items form a single questionnaire grid in which respondents report whether they undertake each of nine activities regularly, irregularly, or not at all.

The Türkiye General Social Survey of 2024 (Türkiye Genel Sosyal Saha Araştırması, TGSS 2024) surveyed 2,615 adults, of whom 1,284 were women. The health and physical activity module was administered in two of three questionnaire forms, so the eligible universe for this analysis is 845 women rather than the full female sample. No sampling weight is distributed with the public file.

Both datasets are publicly available secondary data collected by other parties. Ethics committee approval is therefore not required for the present analysis.

The choice of the 2008 round of the TDHS requires comment, since later rounds of the survey exist. The religiosity and leisure items used here belong to a country-specific module rather than to the standard DHS instrument, and the 2008 round is the one in which sport participation, holidays, eating outside the home, ritual prayer, fasting and headscarf use are recorded together on a single comparable scale. Without that battery the central comparison of this paper, which sets a devotional measure against a measure of public religious expression within one model, cannot be constructed from DHS data at all. The design also does not rest on the older survey alone. Recent evidence is supplied by the TGSS 2024, and the 2008 round serves as an independent earlier sample against which the 2024 findings can be checked. A result that holds in both is stronger than one obtained from either in isolation, which is the logic of the parallel design adopted here.

### 2.2. Measures

In TDHS 2008 the outcome is sport participation, coded as no participation, irregular participation, or regular participation. Two further leisure activities, going on holiday and eating outside the home, are measured identically and serve as comparison outcomes. Religiosity is measured by performance of the ritual prayer, Ramadan fasting, and wearing a headscarf when going out, each on the same three-point frequency scale, together with a binary indicator of ever having attended a Qur'an course. Controls are age in single years, educational attainment, the DHS household wealth quintile, children ever born, urban or rural residence, current marital status, and region entered as four dummies with the West as reference.[2]

In TGSS 2024 the outcomes are frequency of physical activity of at least twenty minutes sufficient to cause sweating or harder breathing, and frequency of walking undertaken for the purpose of exercise, each on a six-point scale from never to daily. Religiosity is measured by six indicators: self-rated religiosity, frequency of the five daily prayers, frequency of supplication, frequency of reading the Qur'an in Arabic, Ramadan fasting, and veiling outside the home. The veiling measure is a five-point scale. It combines the filter question on ever wearing a headscarf with the follow-

[2] Qur'an courses in Türkiye are non-formal religious education programmes administered by the Presidency of Religious Affairs. They are most commonly attended during the summer school holiday, which is why the survey item records past attendance rather than current enrolment. The pattern differs among Muslim minority populations in Europe, where comparable courses typically run throughout the year, often on Saturdays in mosques or in the cultural centres attached to them. The 2008 item therefore captures a credential acquired in childhood or adolescence rather than an ongoing activity.

up question on how often one is worn outside the home. Respondents who report wearing a headscarf but never outside the home are grouped with those who never wear one, since the construct of interest is public veiling.

Two measurement decisions warrant comment. The item on Qur'an reading asks specifically about reading in Arabic, which is an acquired competence rather than a devotional frequency; it is therefore interpreted here as an indicator of religious literacy or religious educational capital rather than of piety, and treated as the conceptual counterpart of the Qur'an course item in 2008. Both surveys also use the Turkish term başörtüsü, which translates as headscarf. Çarkoğlu and Kalaycıoğlu (2009, p. 163) note that women who wear a türban, the more politically marked term for a tightly pinned headscarf covering the hair and neck, describe their own attire as başörtüsü, so the item captures the broad category rather than a politically marked subset.

Education is harmonised across surveys into four levels, none, primary, secondary, and higher. Household income in 2024 is measured in banded categories and entered as the logarithm of band midpoints; results are unchanged under alternative codings.

### 2.3. Analytic Samples

For TDHS 2008 the analytic sample is 7,336 of 7,405 respondents, or 99.1%, complete on all variables across the three leisure outcomes. Excluded cases are marginally older than included cases but do not differ on education, wealth, children ever born, urban or rural residence, or region. For TGSS 2024 the analytic sample is 697 of the 845 women eligible for the rotated module, a retention of 82.5%. The apparent missingness in the full TGSS file is predominantly a product of module rotation by design rather than of non-response.

### 2.4. Analytic Strategy

For TDHS 2008 the models are binary logistic regressions predicting any sport participation against none, applying the sampling weight and correcting standard errors for stratification and clustering within primary sampling units, with 618 design degrees of freedom. Ignoring the design understates standard errors by between 18% and 35% in these data. Three-category multinomial models were also estimated and are reported in the text: they show that both religiosity indicators distinguish non-participants from regular participants while neither distinguishes irregular from regular participants, which is why the binary contrast is used for presentation.

For TGSS 2024 the models are ordinal logistic regressions. The proportional odds assumption was assessed by comparing coefficients across binary logits at successive cut-points. Under the final specification the religiosity coefficients are proportional. Education is not, and this is reported as a substantive result rather than treated as a nuisance. Estimates are unweighted.

The two surveys are analysed in parallel and are not pooled. The populations differ, the outcome instruments differ, the socioeconomic measures differ, self-rated religiosity has no 2008 counterpart, and design information is available for one survey and not the other. Measurement invariance fails on each count, and a pooled interaction term would not be interpretable. The design is therefore best described as a conceptual replication across two independent samples using non-identical instruments.

## 3. Findings

### 3.1. Descriptive Statistics

Table 1 reports the analytic samples. In 2008, three-quarters of ever-married women aged 15 to 49 reported no sport participation at all and fewer than one in ten participated regularly. In 2024, 37.0% of women reported never undertaking twenty minutes of moderate-to-vigorous activity,

while 36.3% did so weekly or more often. Walking for exercise is considerably more common: 23.7% never walk for exercise and 47.3% do so several times a week or daily.

**Table 1:** *Descriptive Statistics for the Analytic Samples, TDHS 2008 and TGSS 2024*

| Variable | TDHS 2008 (*n* = 7,336) | TGSS 2024 (*n* = 697) |
|---|---|---|
| **Leisure-time physical activity** | | |
| Sport: none / irregular / regular (%) | 75.4 / 15.3 / 9.3 | n/a |
| Exercise ≥ 20 min: never (%) | n/a | 37.0 |
| Exercise: weekly or more often (%) | n/a | 36.3 |
| Walking for exercise: never (%) | n/a | 23.7 |
| Walking: weekly or more often (%) | n/a | 47.3 |
| **Comparison leisure activities** | | |
| Holiday: none / irregular / regular (%) | 63.6 / 21.3 / 15.1 | n/a |
| Eating out: none / irregular / regular (%) | 51.6 / 34.8 / 13.6 | n/a |
| **Religiosity** | | |
| Ritual prayer, highest category (%) | 47.0 | 39.5 |
| Ritual prayer, never (%) | 22.5 | 13.3 |
| Ramadan fasting, highest category (%) | 86.2 | 74.2 |
| Public veiling, never (%) | 27.9 | 35.9 |
| Public veiling, always or regular (%) | 70.8 | 56.2 |
| Religious literacy (%) | 39.8[a] | 72.7[b] |
| Religious or very religious (%) | n/a | 76.4 |
| **Sociodemographic characteristics** | | |
| Age, *M* (*SD*) | 34.43 (8.39) | 38.46 (13.84) |
| Education: none / primary (%) | 13.4 / 54.5 | 6.2 / 18.8 |
| Education: secondary / higher (%) | 11.0 / 21.1 | 48.1 / 27.0 |
| Urban residence (%) | 75.9 | 71.9 |
| Currently married (%) | 94.6 | 63.0 |
| Children ever born, *M* (*SD*) | 2.47 (1.85) | n/a |

**Note:** TDHS estimates are weighted by V005/1,000,000. TGSS estimates are unweighted; no sampling weight is distributed with the public file. Education is harmonised across surveys as none, primary, secondary, and higher. Entries marked n/a indicate that no comparable measure exists in that survey. [a] Ever attended a Qur'an course. [b] Reads the Qur'an in Arabic at any frequency.

Religious practice is widespread in both samples. Ramadan fasting is near-universal, reported at the highest frequency by 86.2% in 2008 and 74.2% in 2024, and self-rated religiosity in 2024 is similarly concentrated, with 76.4% describing themselves as religious or very religious. Belief measures in the 2024 file are unusable for the present purpose: 92% of respondents occupy the highest category on belief in God and 86% on its importance, leaving no variance to model. This is itself a reason to operationalise religiosity through practice and expression rather than through belief.

### 3.2. Bivariate Associations

In the 2008 data, all four religiosity indicators are associated with sport participation at the bivariate level except Qur'an course attendance. Veiling shows the strongest association, $\chi^2(4) =$

456.5, $p < .001$, followed by Ramadan fasting, $\chi^2(4) = 108.6$, $p < .001$, and ritual prayer, $\chi^2(4) = 11.9$, $p = .018$. Qur'an course attendance falls short of conventional significance, $\chi^2(2) = 5.3$, $p = .071$.

The null result for Qur'an course attendance deserves comment, because it is the one religiosity indicator in the 2008 data that measures acquired religious education rather than current practice or public appearance. Attendance is common: 39.8% of the weighted sample reported having attended at some point. Its lack of association with sport, at the bivariate level and in the adjusted models alike, suggests that religious schooling neither enables nor constrains women's leisure activity in the way that devotional routine and veiling each do. This matters for the comparison with 2024, where the corresponding measure asks about current Qur'an reading in Arabic rather than past attendance, and does reach significance. The divergence is most plausibly a difference between a dormant credential and an exercised competence, rather than evidence of change over time.

The prayer association requires care, because its direction reverses between the bivariate and adjusted results. At the bivariate level, women who never perform the ritual prayer are somewhat more likely to report regular sport participation, at 11.2%, than women who perform it regularly, at 9.1%. In the adjusted models reported below the coefficient is strongly positive. Ritual prayer correlates with veiling at .445 and with fasting at .397, and once the constraining dimension is held constant the residual association of devotional practice with activity is positive. This is a suppression pattern, and it is reported as such rather than presented only in adjusted form. Variance inflation factors do not exceed 2.21, so the pattern is substantive rather than an artefact of collinearity.

In the 2024 data, Qur'an reading shows the clearest bivariate association with exercise frequency, $\chi^2(14) = 36.2$, $p = .001$, $\rho = .108$, $p = .004$. Veiling is negatively associated, $\rho = -.094$, $p = .013$, as is self-rated religiosity, $\rho = -.080$, $p = .034$. Neither ritual prayer nor Ramadan fasting is associated at the bivariate level. Variance inflation factors do not exceed 2.38 and intercorrelations among the religiosity measures range from .23 to .56.

Read side by side, the two sets of bivariate results agree on one dimension and diverge on two. Veiling is negatively associated with activity in both surveys, and it is the strongest religiosity association in 2008. Ritual prayer is significant in 2008 and absent in 2024, while religious literacy shows the reverse pattern. The agreement on veiling is the more informative of the three, because it holds across two different outcome instruments, two different populations and a sixteen-year interval, which is what a conceptual replication is designed to establish. The two divergences should not be read as social change, since the underlying items differ: the 2008 prayer measure is a three-point regularity scale sharing a response grid with the sport outcome, whereas the 2024 measure is a five-point frequency scale drawn from a separate module. Taken together, the bivariate results already indicate that the religiosity dimensions do not move as one, which is the premise the multivariate models go on to test.

### 3.3. Multivariate Models, TDHS 2008

Table 2 reports nested models. Demographic characteristics alone account for a modest share of variation, and the large rural disadvantage evident in M1 is entirely absorbed once education and wealth enter in M2, which is the pattern health lifestyle theory would lead one to expect. Socioeconomic position dominates: each additional wealth quintile is associated with roughly a 55% increase in the odds of participation, and each step of educational attainment with roughly 24%.

The religiosity block in M3 produces the central result. Ritual prayer is positively associated with participation, $b = 0.320$, $OR = 1.38$, $p < .001$, while veiling is negatively associated, $b = -0.242$,

*OR* = 0.78, $p < .001$. Both reach significance within the same specification, net of weighting, clustering, region, urban or rural residence, fertility, marital status, education, and wealth. Ramadan fasting is not significant, and neither is Qur'an course attendance. Design-corrected Wald tests confirm the pattern: $F = 28.0$ for ritual prayer and $F = 17.6$ for veiling, against $F = 3.6$, $p = .057$, for fasting and $F = 1.5$, $p = .217$, for Qur'an course attendance.

Three-category models locate where these associations operate. Both ritual prayer, $b = -0.401$, and veiling, $b = 0.268$, distinguish non-participants from regular participants, while neither distinguishes irregular from regular participants, at $b = -0.134$ and $b = 0.049$ respectively. Religiosity is associated with whether a woman undertakes any sport at all, and is uninformative about how regularly she does so once she has begun. Education is the only predictor operating on both margins. It is also worth noting that currently married women are less likely to be regular participants, $b = 0.510$, $p = .016$, though not less likely to participate at all. The asymmetry is informative. If marriage operated by restricting permission, it would deter participation altogether rather than only its regularity. That it bears on regularity instead points to the competing demands of domestic and care work, which fall disproportionately on married women and fragment the continuous blocks of time that regular exercise requires. The fertility coefficient points the same way: each additional child reduces the odds of participating by roughly 10%, net of age and marital status.

**Table 2:** *Nested Logistic Regression Models Predicting Any Sport Participation, TDHS 2008*

| **Predictor** | **M1 b (SE)** | **M2 b (SE)** | **M3 b (SE)** | **M3 OR** |
|---|---|---|---|---|
| Age | 0.062 (0.006)*** | 0.051 (0.006)*** | 0.046 (0.006)*** | 1.05 |
| Currently married | −0.051 (0.144) | −0.171 (0.158) | −0.140 (0.161) | 0.87 |
| Children ever born | −0.312 (0.033)*** | −0.114 (0.035)*** | −0.108 (0.034)** | 0.90 |
| Rural residence | −1.043 (0.135)*** | −0.272 (0.122)* | −0.279 (0.119)* | 0.76 |
| Region: South | 0.004 (0.135) | 0.414 (0.119)*** | 0.390 (0.118)*** | 1.48 |
| Region: Central | −0.243 (0.131) | −0.298 (0.116)* | −0.269 (0.117)* | 0.76 |
| Region: North | −0.312 (0.145)* | −0.235 (0.134) | −0.226 (0.135) | 0.80 |
| Region: East | −0.454 (0.129)*** | 0.075 (0.113) | 0.067 (0.116) | 1.07 |
| Education | | 0.240 (0.032)*** | 0.217 (0.035)*** | 1.24 |
| Household wealth | | 0.475 (0.044)*** | 0.440 (0.044)*** | 1.55 |
| Ritual prayer (namaz) | | | 0.320 (0.060)*** | 1.38 |
| Ramadan fasting | | | −0.132 (0.072) | 0.88 |
| Public veiling | | | −0.242 (0.057)*** | 0.78 |
| Qur'an course | | | 0.099 (0.084) | 1.10 |
| *McFadden $R^2$* | .086 | .158 | .166 | |

**Note:** n = 7,336. Reference category is no participation. Weighted by V005/1,000,000, with standard errors corrected for stratification and clustering within 628 primary sampling units (618 design df). Reference categories are urban residence and the West region. Education is coded 0 = none to 5 = higher; household wealth is the DHS asset quintile. Religiosity indicators are coded 0 = no, 1 = irregular, 2 = regular. * p < .05. ** p < .01. *** p < .001.

### 3.4. Discriminating the Mechanism

If religious constraint on women's sport operates through the specific demands of athletic dress, its association should be strongest for sport and weaker for leisure activities that carry no such demands. If instead it operates through the regulation of women's presence in public space, the ordering should be flat or reversed. Table 3 reports identical models estimated across three outcomes.

The ordering is reversed, and clearly so. The veiling coefficient is −0.242 for sport, −0.382 for holidays, and −0.388 for eating outside the home, so that the association is roughly 60% larger for the two activities in which athletic dress is irrelevant. Ritual prayer runs the opposite way, at 0.320 for sport, 0.189 for holidays, and 0.129 for eating out, so that the enabling association is two and a half times larger for sport than for eating out. Each dimension of religiosity is ordered across leisure domains in the direction the public-visibility account predicts, and against the direction a modesty-of-athletic-dress account would predict.

**Table 3:** *Ritual Prayer and Public Veiling Across Three Leisure Domains, TDHS 2008*

| Predictor | Sport b (SE) | Holiday b (SE) | Eating out b (SE) |
|---|---|---|---|
| Ritual prayer (namaz) | 0.320 (0.060)*** | 0.189 (0.056)*** | 0.129 (0.056)* |
| Odds ratio | 1.38 | 1.21 | 1.14 |
| Public veiling | −0.242 (0.057)*** | −0.382 (0.056)*** | −0.388 (0.059)*** |
| Odds ratio | 0.78 | 0.68 | 0.68 |
| Ramadan fasting | −0.132 (0.072) | −0.071 (0.069) | 0.058 (0.085) |
| Qur'an course | 0.099 (0.084) | 0.104 (0.073) | 0.248 (0.080)** |
| Education | 0.217 (0.035)*** | 0.328 (0.031)*** | 0.269 (0.030)*** |
| Household wealth | 0.440 (0.044)*** | 0.761 (0.040)*** | 0.794 (0.041)*** |
| *McFadden $R^2$* | .166 | .283 | .281 |

**Note:** n = 7,336. Each column is a separate logistic regression predicting any participation against none, using the covariate set of Table 2, M3; demographic and regional controls are estimated but omitted here for space. Weighted and design-corrected as in Table 2. * p < .05. ** p < .01. *** p < .001.

### 3.5. TGSS 2024

Table 4 reports the 2024 models. Qur'an reading is positively associated with exercise frequency, $b = 0.127$, $OR = 1.14$, $p < .001$, and veiling negatively, $b = -0.125$, $OR = 0.88$, $p = .002$. Education and urban residence are the other significant predictors, the latter substantially so at $OR = 1.73$. Self-rated religiosity, ritual prayer, supplication, and Ramadan fasting show no independent associations.

The walking models differ instructively. Veiling is again negative and is the only religiosity measure to reach significance, $b = -0.162$, $p < .001$. Urban residence, strongly associated with structured exercise, is unrelated to walking, which is consistent with a facilities mechanism operating on the former and not the latter. Household income is negatively associated with walking, $b = -0.111$, $p = .038$, plausibly reflecting substitution toward motorised transport and paid facilities, though this is advanced only as a conjecture.

**Table 4:** *Ordinal Logistic Regression Models Predicting Physical Activity, TGSS 2024*

| Predictor | Exercise b (SE) | OR | Walking b (SE) | OR |
|---|---|---|---|---|
| Age | 0.003 (0.006) | 1.00 | 0.011 (0.006) | 1.01 |
| Education (4 levels) | 0.258 (0.102)* | 1.29 | 0.274 (0.098)** | 1.32 |
| Household income (log) | −0.040 (0.051) | 0.96 | −0.111 (0.055)* | 0.90 |
| Currently married | −0.008 (0.151) | 0.99 | 0.081 (0.149) | 1.08 |
| Self-rated health | 0.115 (0.095) | 1.12 | 0.115 (0.093) | 1.12 |
| Urban residence | 0.549 (0.161)*** | 1.73 | 0.193 (0.156) | 1.21 |
| Self-rated religiosity | −0.191 (0.113) | 0.83 | 0.107 (0.109) | 1.11 |
| Ritual prayer (namaz) | −0.047 (0.074) | 0.95 | 0.063 (0.072) | 1.06 |
| Supplication (dua) | 0.062 (0.071) | 1.06 | 0.049 (0.070) | 1.05 |
| Qur'an reading | 0.127 (0.036)*** | 1.14 | 0.038 (0.034) | 1.04 |
| Ramadan fasting | 0.127 (0.070) | 1.14 | 0.001 (0.068) | 1.00 |
| Public veiling | −0.125 (0.047)** | 0.88 | −0.162 (0.047)*** | 0.85 |
| *McFadden $R^2$* | .026 | | .015 | |

**Note:** n = 697. Both outcomes are six-category frequency measures (1 = never to 6 = daily or almost daily); positive coefficients indicate more frequent activity. Threshold parameters are estimated but not shown. Estimates are unweighted. Public veiling ranges from 1 = never veils outside the home to 5 = always. Nested models return McFadden $R^2$ of .010 for demographics, .017 with socioeconomic status added, and .026 with religiosity added. * $p < .05$. ** $p < .01$. *** $p < .001$.

Household income is not associated with exercise frequency under any of the three codings estimated, at $p = .58$, .27, and .34 respectively, so the null is not an artefact of the banding. This should not be interpreted as evidence of change from the strong wealth association observed in 2008, because the two instruments differ in kind: the DHS measure is an asset index insulated from price levels, whereas the 2024 measure is banded nominal monthly income reported during a period of high inflation.

Restricting the 2024 sample to ever-married women aged 18 to 49, the population most closely comparable to the 2008 frame, leaves the two principal findings intact and slightly strengthened: veiling $b = -0.199$, $p = .002$, and Qur'an reading $b = 0.129$, $p = .004$, on 401 cases.

Cut-point estimates indicate that veiling and Qur'an reading satisfy proportional odds, at −0.114, −0.140, and −0.132 and at 0.142, 0.111, and 0.116 respectively across the three cut-points. Education does not, at 0.466, 0.138, and 0.125, and therefore operates on entry into activity rather than on its frequency. This mirrors the 2008 finding that education is the one predictor acting on both margins.

## 4. Discussion

The central finding is that two dimensions of religiosity are associated with women's leisure-time physical activity in opposite directions within a single model, and that both associations are substantial. This is what a unidimensional measure would erase, and it offers one explanation for why the quantitative literature has found this relationship elusive.

The result qualifies the expectation embedded in health lifestyle theory. Cockerham (2005, p. 59) placed religion among the collectivities shaping health lifestyles and anticipated that highly religious people would display more positive health lifestyles, while noting that the evidence was thin. The findings here suggest that the anticipated positive relationship exists but is only half the story, and that its counterpart is not a weaker positive association but a substantial negative one

attaching to a different component of the same construct. Religion enters health lifestyles through more than one channel, and the channels can conflict. The implication for the theory is specific rather than general. Cockerham's collectivities category treats shared religious norms as a structural influence on the dispositions from which health practices follow. These data suggest that a single collectivity can transmit opposing dispositions at once: the devotional norm encourages bodily care while the norm governing public appearance restricts the settings in which that care can be enacted. A theory which enters religion as one variable cannot represent this, and will record the net of two offsetting effects as a weak or absent association. The practical consequence for empirical work is that religious collectivities should be modelled through their separate normative channels rather than through membership or intensity alone.

The mechanism test speaks to a question the qualitative literature has raised but could not settle at population scale. Accounts of Muslim women's physical activity frequently attribute constraint to the difficulty of exercising in modest dress, and this is well documented at the level of experience: Calderon Pacheco (2015, p. 36) reports difficulty finding appropriate attire even among women who did not experience modesty as inhibiting participation. The estimates suggest that at population scale this is not where the weight of the association lies. If athletic dress were the operative constraint, the veiling coefficient would be largest for sport. It is smallest for sport, and larger by roughly 60% for holidays and for eating outside the home, activities that impose no athletic dress requirement whatever. What the coefficient appears to track is participation in public sociable space. This is precisely what Pfister (2000, p. 510) described as regulated through honour and external supervision, and what Çarkoğlu and Kalaycıoğlu (2009, pp. 76-77) identify as the contested terrain of Turkish public life. Both sources matter for this study because each supplies a mechanism the present data can test but not observe directly. Pfister's account predicts that constraint should attach to a woman's visibility rather than to the activity she undertakes, which is the ordering across the three leisure outcomes reported in Table 3. Çarkoğlu and Kalaycıoğlu explain why the headscarf in particular carries this weight in Türkiye, where it became the object of public contest rather than a private devotional choice. Read together, they convert a statistical ordering into an interpretable mechanism.

This reading has an implication that cuts against a common policy instinct. If the barrier were athletic dress, appropriate sportswear and modest kit would substantially address it. The present findings suggest such measures would be necessary but not sufficient, and that provision addressing the conditions of women's presence in public leisure space, including gender-segregated facilities and usable scheduling, is likely to matter more. Thorpe et al. (2020, pp. 13-16) document how badly this is currently done even where it is attempted. The Beirut case analysed by Deeb and Harb (2013, p. 66) shows that religiously legitimate leisure infrastructure can be produced, and that where it exists piety and public leisure cease to be in tension. The parallel with the present findings is direct: in both settings the obstacle lies in the moral terms on which public space is available to pious women, not in religious commitment itself.

The enabling pathway also deserves comment. Ritual prayer in 2008 is positively associated with participation once veiling is controlled, and its association is strongest for sport specifically. This is consistent with the doctrinal material documented by Aboul-Enein (2016, p. 823) and with the Prophetic precedent described by Kuşçuzade (2015, p. 398), and with Akgül and Kaplan's (2017, p. 2396) positive findings for Turkish samples. It is also consistent with the bodily discipline of the prayer routine itself, in Zaman's (1997, p. 55) sense. This association is visible, however, only after the constraining dimension is held constant, which is the practical payoff of the multidimensional approach.

Two dimensions did not behave as the enabling account would predict. Ramadan fasting is not significantly associated with activity in either survey, and self-rated religiosity shows no

independent association in either. The latter is worth stating plainly, because subjective religiosity is the measure most commonly used when a single religiosity item is available. On the present evidence it is the least informative of the measures examined.

The two surveys agree on veiling and disagree on ritual prayer. Veiling is negatively associated with activity in 2008, with exercise in 2024, and with walking in 2024, and survives restriction to the comparable subpopulation. Ritual prayer is strongly positive in 2008 and null in 2024. There is reason for caution in reading this as social change. The 2008 prayer item shares a response grid and answer format with the sport outcome, while the 2024 items are drawn from separate modules, so common-method variance is a live alternative explanation for the stronger 2008 association. The measures also differ in granularity.

On the broader question of secularisation and religious vitality, the data permit description rather than inference. Among ever-married women aged 18 to 49, always or regularly veiling in public stood at 70.8% in the weighted 2008 sample and 58.5% in the 2024 sample. The two samples are not a panel and the surveys are not equivalent instruments, so this is presented as a descriptive contrast rather than an estimated trend. What can be said with more confidence is that the association between veiling and activity persists across both surveys, so that whatever has changed in prevalence, the relationship itself has not disappeared.

Finally, education emerges as the most consistent predictor in both surveys and the only one operating on both the entry and the frequency margins. This aligns with the emphasis in health lifestyle research on education as the component of socioeconomic position that most directly enhances effective agency. That household income shows no association in 2024, while education does, is at least suggestive that what matters is not purchasing power alone. Education is also the only predictor in either survey which operates on both margins, shaping whether a woman takes up activity at all and how often she sustains it, whereas religiosity bears on entry alone. Two readings are consistent with this. Schooling may raise the perceived legitimacy of women's presence in public leisure space, loosening the same constraint that veiling tightens. It may equally supply the scheduling autonomy and health literacy on which sustained activity depends. The data cannot separate these, but either reading makes education the most promising point of intervention, because it is the one factor associated with activity at every stage rather than only at the threshold.

## 5. Limitations

Both surveys are cross-sectional, and no causal claims are made. Veiling, devotional practice, and physical activity are plausibly reciprocally related and jointly shaped by family and community context that is not observed here.

The 2008 religiosity and leisure items come from a single response grid with an identical answer format, which raises the possibility of common-method variance. This threat is most acute for the ritual prayer result and least acute for the veiling result, which replicates in a survey where the two constructs are measured in separate modules.

The TGSS 2024 public file contains no sampling weight, so those estimates are unweighted and their standard errors are not corrected for the sample design. They should be read as less precise than the 2008 estimates.

The outcomes capture leisure-time activity only. Neither survey measures occupational, domestic, or transport-related activity. This matters particularly for women, since leisure-time exercise measures (Ainsworth, 2000, as cited in Cockerham, 2005, p. 62) may not adequately represent the physical activity of women engaged in childcare and housework. A woman may be highly active and still report never exercising.

Measurement non-equivalence between the surveys is substantial, which is why they are analysed in parallel. The comparisons drawn are conceptual rather than statistical, and the 2008 to 2024 contrasts are descriptive.

Finally, all measures are self-reported, and religiosity measures in particular may be subject to social desirability effects that vary with interview context. Çarkoğlu and Kalaycıoğlu (2009, p. 93) observe that revealed religiosity in Turkish surveys responds to respondents' economic expectations, which suggests these measures are not wholly independent of circumstance.

## 6. Conclusion

Treating religiosity as a single quantity obscures more than it reveals. Across two independent Turkish national samples, dimensions of religiosity are associated with women's leisure-time physical activity in opposing directions, and an index combining them would report approximately nothing. Ritual devotional practice is associated with greater participation once public religious expression is controlled; public veiling is associated with less, consistently, and in both surveys.

The mechanism appears to lie in public visibility rather than in athletic dress. The veiling coefficient is smallest for sport and largest for holidays and eating outside the home, an ordering that a dress-based account cannot produce. What is constrained is not the moving body but the publicly visible woman.

Set against the expectations stated in Section 1.5, the evidence is largely but not uniformly supportive. The first expectation, that the dimensions of religiosity would not share a common sign, is supported: ritual prayer and veiling reach significance in opposite directions within the same 2008 specification. This is what the subdimensional structure recovered by Taş et al. (2020, p. 736) would predict, and it is consistent with the positive associations Akgül and Kaplan (2017, p. 2396) obtained when religiosity was allowed to vary across components. The second expectation, that devotional practice would be positively associated with activity once veiling was controlled, is supported in 2008 but not in 2024, where ritual prayer is not significant. The 2008 result accords with the doctrinal and Prophetic material documented by Aboul-Enein (2016, p. 823), Kuşçuzade (2015, p. 398) and Zaman (1997, p. 55); the 2024 null counsels against treating that pathway as established. The third expectation is the most strongly supported. Veiling is negatively associated with activity in both surveys, and its coefficient is larger for leisure activities carrying no dress requirement, which is the ordering the visibility accounts of Pfister (2000, p. 510), Walseth (2006, p. 88) and Dagkas and Benn (2006, p. 25) imply and which the facility evidence of Thorpe, Ahmad, Marfell and Richards (2020, pp. 13-16) describes at the level of provision. The finding qualifies rather than contradicts Calderon Pacheco (2015, p. 56) and Jiwani and Rail (2010, p. 251), who show modesty being negotiated: negotiation evidently occurs, but at population scale it does not neutralise the association. The fourth expectation, that bivariate associations would attenuate once socioeconomic position entered, is supported, with the rural disadvantage of M1 absorbed entirely by education and wealth in M2.

For health lifestyle theory, this suggests that religion belongs among the structural collectivities shaping health lifestyles, as Cockerham proposed, but that it should enter as a differentiated rather than a unitary construct. For research, it suggests that studies relying on a single religiosity item, and self-rated religiosity in particular, are likely to understate the role of religion by averaging its components. For policy, it suggests that expanding women's physical activity in Türkiye depends less on adapting the activity to religious requirements than on the conditions under which women can be present in public leisure space at all.

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