

Affective and Religious-Motivational Pathways to Academic Motivation and Perceived Physical Performance in Omani Female Physical Education Students During Ramadan Fasting

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Purpose: This study aimed to examine direct and indirect associations of mood states and religious motivation with academic motivation and perceived physical performance among Omani female physical education (PE) students during Ramadan fasting (RF). It tested fasting-related adaptation as an affective and religious-motivational process in a Muslim Gulf context.

Methods: In total, 374 PE students aged 18–24 years participated during weeks 2–3 of RF. They completed an online questionnaire assessing negative mood states (NMood), positive mood (PMood), intrinsic religious motivation (IRM), extrinsic religious motivation (ERM), perceived physical performance (PPP) and academic motivation (AM). The hypothesized structural model tested 12 direct and 8 indirect paths. Data were analyzed using structural equation modeling (SEM).

Results: Both the measurement model and the structural model showed generally acceptable fit ($\chi^2/df = 2.90$, CFI = .903, TLI = .895, RMSEA = .071, SRMR = .063). Eight of 20 hypotheses were significant. Among the direct relationships, PMood showed the strongest link with PPP ($\beta = .39$, $P < .001$), followed by NMood ($\beta = -.29$, $P = .004$) and IRM ($\beta = .19$, $P = .034$). For AM, NMood ($\beta = -.23$, $P = .014$) and IRM ($\beta = .33$, $P = .001$) showed significant but opposite relationships, whereas PMood and ERM were unrelated to AM. NMood also showed a strong negative association with IRM ($\beta = -.41$, $P < .001$). For mediation, significant indirect associations through IRM were observed for NMood–AM ($b = -.176$, 95% BC CI $[-.392, -.052]$, $P = .001$, $\beta = -.135$) and NMood–PPP ($b = -.048$, 95% BC CI $[-.121, -.005]$, $P = .027$, $\beta = -.076$). No other indirect effects were significant.

Conclusions: Female PE students' adaptation during RF was associated with mood states and internal religious motivation. RF should therefore be understood not only as a scheduling, but also as an affective and culturally grounded motivational process. Gulf universities should consider adjusted training loads, avoiding practical examinations during fasting hours, monitoring students' mood and readiness, and supporting students with fatigue or NMood.

Keywords: Emotional strain; learning engagement; Culturally grounded religious engagement; Fasting-related physical exertion

Ramadan fasting (RF) is one of the five pillars of Islam and represents a religious practice observed annually by Muslims who have reached puberty. During this period, Muslims abstain from food and drink daily from dawn to sunset. Beyond its ritual dimension, RF is characterized by intensified spirituality, religious devotion, prayer, Quranic recitation, and charitable acts. For many believers, RF represents a meaningful spiritual experience that supports personal growth, self-discipline, and self-awareness.¹

Beyond its religious dimension, RF has been associated with several psychological and social benefits, such as improved emotional regulation, psychological well-being, and social

connectedness.² Spiritual engagement and self-regulatory processes also contribute to emotional stability and lower negative emotions.³

However, among athletes, RF is associated with physiological, psychological, and behavioral disruptions, including changes in eating habits, hydration, sleep schedules, and daily activities.⁴ These changes affect energy availability, recovery, cognitive function, and psychological well-being, creating challenges for maintaining performance throughout this month.⁵ This challenge is also relevant for physical education (PE) students, who must combine theoretical courses with practical training sessions. In this population, fasting-related constraints can contribute to sleep

disturbances and daytime fatigue, with possible consequences for learning outcomes and performance-related issues.^{6,7}

Nevertheless, these effects depend on individual adaptive capacities and the strategies used to cope with fasting-related demands.⁸ This issue is particularly relevant for PE students, as RF represents both a physiological and psychological challenge, whose effects on academic performance and physical functioning depend partly on students' coping resources and adaptive strategies.^{9,10} In this process, mood states (MS) help clarify how students evaluate their academic motivation (AM) and perceived physical performance (PPP) during RF. Lane and Terry's (2000)¹¹ conceptual model provides a theoretical basis for examining MS in sport by showing that mood dimensions are interacting psychological responses that can shape behavior and performance. In line with this view, Lau et al. (2023)¹² reported that RF altered both mood and performance in adolescent archers. These findings suggest that positive mood (PMood) can support favorable self-evaluation, whereas negative mood (NMood), including fatigue, tension, confusion, and depressive feelings, can reduce perceived competence during RF.

Students' adaptation during RF also depends on the motivational significance they assign to it and their religious engagement. Fatima et al. (2017)¹³ showed that Islamic religiosity is related to academic motivation among university students. This mechanism can be interpreted through self-determination theory (SDT), which distinguishes self-endorsed from controlled forms of motivation.¹⁴ Park (2021)¹⁵ describes religious motivation (RM) as including intrinsic and extrinsic components, reflecting whether engagement with religious beliefs and practices is personally meaningful or externally driven. In sport, these regulations shape engagement, persistence, and self-regulated behavior.¹⁶ Noh et al. (2024)¹⁷ also linked religious-psychological factors with self-perceived sport performance among religious athletes.

Therefore, RF combines spiritual benefits with physiological, physical, and psychological constraints. For PE students, this creates a compromise between religious engagement, academic demands, and practical physical performance. This compromise is particularly relevant in culturally Muslim contexts, such as Gulf countries, where RF is both a personal religious practice and a shared social reality. Testing MS, RM, AM, and PPP within the same integrative model can clarify how female PE students manage fasting-related demands across emotional, academic, physical, and religious dimensions.

Accordingly, the aim of this study was to examine the direct associations of PMood, NMood, intrinsic religious motivation (IRM), and extrinsic religious motivation (ERM) with AM and PPP in Omani female PE students during RF and to test mediation through IRM and ERM in the associations between mood states and these two outcomes. Using structural equation modeling (SEM), the study explores the emotional, motivational, and religious processes associated with academic and physical adaptation among female PE students during RF in a Muslim context.

Hypothesis Development

Building on Lane and Terry's MS framework and SDT, this section translates the theoretical model into testable hypotheses. It specifies how MS and RM are expected to relate to PPP and AM, and examines whether IRM and ERM mediate the associations linking mood states to these outcomes during RF.

Associations of MS with PPP

During RF, changes in sleep, hydration, eating routines, and fatigue can alter mood and perceived readiness. NMood is therefore expected to weaken perceived physical capacity,

whereas PMood is expected to support more favorable self-evaluations.

H1: NMood is negatively associated with PPP

H2: PMood is positively associated with PPP

Associations of RM with PPP

RM explains how students interpret exertion and practical demands during RF. In Muslim sport contexts, IRM links fasting-related effort to personally endorsed religious meaning, supporting self-control and persistence. ERM, in contrast, reflects controlled motives that are less likely to sustain adaptive effort under fasting-related strain.

H3: IRM is positively associated with PPP

H4: ERM is negatively associated with PPP

Associations of MS with AM

During RF, sleep disturbance, fatigue, and psychological strain can disrupt attention and academic learning. NMood is expected to reduce concentration and sustained effort, whereas PMood is expected to support learning engagement. This is consistent with evidence showing that emotions shape motivation and self-regulated learning.

H5: NMood is negatively associated with AM

H6: PMood is positively associated with AM

Associations of RM with AM

RM is relevant to AM because it captures the meaning students attach to learning during RF. IRM connects academic effort with personally endorsed religious values, supporting autonomous commitment. ERM reflects controlled compliance and is less likely to maintain academic engagement.

H7: IRM is positively associated with AM

H8: ERM is negatively associated with AM

Associations of MS with RM

Mood states can influence how students experience religious motivation during RF. PMood is expected to support openness to personally meaningful religious engagement, whereas NMood may disturb this internal meaning and increase reliance on controlled motives.

H9: NMood is associated with IRM

H10: NMood is associated with ERM

H11: PMood is associated with IRM

H12: PMood is associated with ERM

Mediating Role of RM Between MS and PPP

The previous relationships suggest that RM may be involved in the relationship between mood states and PPP. IRM can channel emotional strain into meaning-based effort and self-control, whereas ERM may translate controlled tension into less favorable physical self-evaluations.

H13: IRM mediates the relationship between NMood and PPP

H14: ERM mediates the relationship between NMood and PPP

H15: IRM mediates the relationship between PMood and PPP

H16: ERM mediates the relationship between PMood and PPP

Mediating Role of RM Between MS and AM

RM is also proposed to mediate the relationship between mood states and AM. IRM may be associated with value-based academic commitment, whereas ERM may be associated with controlled pressure and weaker learning involvement.

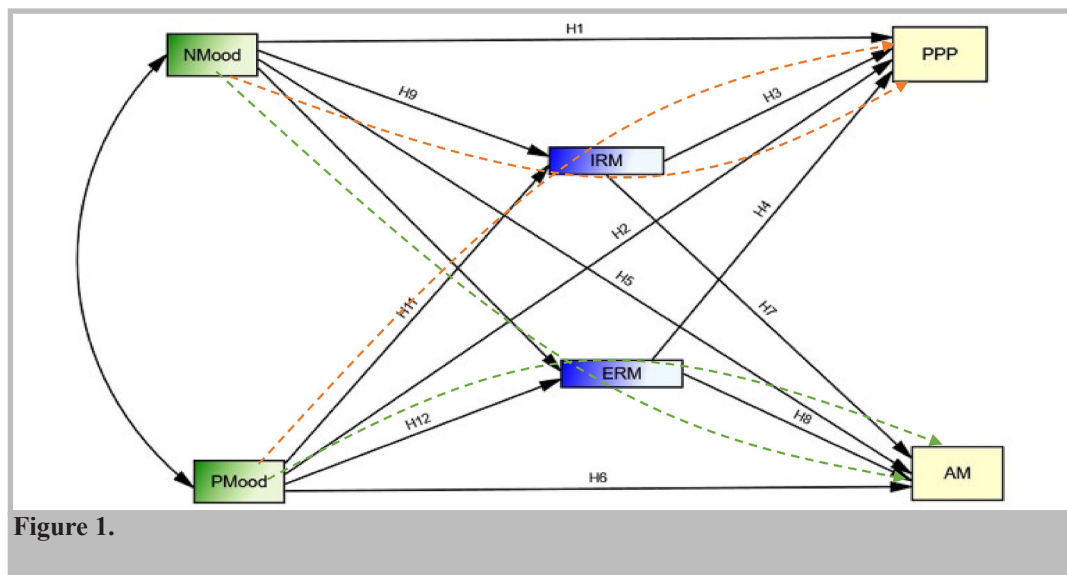
H17: IRM mediates the relationship between NMood and AM

H18: ERM mediates the relationship between NMood and AM

H19: IRM mediates the relationship between PMood and AM

H20: ERM mediates the relationship between PMood and AM

Figure 1 below presents the hypothesized structural model, including the direct and indirect associations through IRM and ERM.



Methods

Participants

The target population included 418 female students enrolled in a PE program at an Omani university. Students were distributed across four academic levels: first year ($n = 111$), second year ($n = 179$), third year ($n = 101$), and fourth year ($n = 27$). Of these, 374 students aged 18–24 years completed the questionnaire, giving a response rate of 89.5%. The sample size was considered adequate for SEM analysis according to common recommendations.¹⁸ Participation was voluntary and anonymous. All participants provided informed consent before accessing the online questionnaire administered through Google Forms, where all items were mandatory. The study protocol was approved by the institutional ethics committee (Ref: blinded for peer review).

Design

Data were collected during the second and third weeks of RF. This period was selected to avoid the early adaptation phase of the first week and the marked fatigue usually observed during the final week. The questionnaire was distributed on academic days. Students completed it immediately after the end of their university classes. This timing was used to capture perceptions related to the academic and physical demands of the study day. During RF, theoretical classes were reduced from 55 to 40 minutes per academic hour. Practical sessions were reduced from 2 hours to 1.5 hours. On a typical academic day, students attended two practical classes and one theoretical class.

Measures

All instruments were administered in Arabic, the university's language of instruction (Appendix A). Validated Arabic versions were used when available. Other scales were translated into Arabic, back-translated into English, and examined by academic experts to ensure clarity and cultural suitability.¹⁹ PMood and NMood were measured using the Arabic version of the Brunel Mood Scale (BRUMS).²⁰ AM was assessed using the Arabic version validated by Cody et al. (2021).²¹ RM was assessed using the intrinsic and extrinsic subscales of the Psychological Measure of Islamic Religiousness (PMIR).²² PPP was measured using Almagro et al.'s (2020) scale.²³

Statistical Analysis

Harman's single-factor test was used to examine potential common method bias. Maximum likelihood (ML) estimation was used to estimate the measurement and structural models and

assess model fit using IBM SPSS Amos 31. Bootstrap resampling with 5,000 resamples was used to obtain standard errors, p values, and 95% bias-corrected confidence intervals for direct and path-specific indirect effects. Direct effects were reported as both unstandardized (b) and standardized (β) coefficients. Indirect effects were evaluated using unstandardized estimates and were considered significant when their 95% bias-corrected confidence intervals excluded zero. Standardized indirect effects (β) were reported to facilitate interpretation.

Reliability was assessed using Cronbach's alpha and composite reliability (CR). Convergent validity (CV) was assessed using standardized factor loadings (λ) and average variance extracted (AVE). Values of $\alpha \geq .70$, $CR \geq .70$, and $AVE \geq .50$ indicated acceptable reliability and convergent validity. Discriminant validity was assessed using the heterotrait-monotrait (HTMT) ratio of correlations. Values below .85 between structural constructs indicated adequate discriminant validity.

The structural model was evaluated using χ^2/df , CFI, TLI, RMSEA, and SRMR indices. Acceptable fit was defined as χ^2/df below 3, CFI and TLI $\geq .90$, and RMSEA and SRMR below .08.

Results

The data were suitable for factor analysis ($KMO = .894$; Bartlett's test of sphericity, $\chi^2(1128) = 13,890.2$, $P < .001$). Harman's single-factor test showed that the first unrotated factor explained 29.0% of the total variance, indicating that no single factor dominated the responses. The initial measurement model comprised two second-order factors; AM, loading on its extrinsic (EAM, 6 items) and intrinsic (IAM, 3 items) dimensions, and NMood, loading on the five BRUMS subscales of tension, depression, anger, fatigue, and confusion, together with four additional first-order factors (PMood/vigor, 4 items; IRM, 5 items; ERM, 5 items; PPP, 5 items). Inspection of this model revealed six items with λ below the .50 criterion. These items (IRM1, IRM2, IRM5, ERM1, ERM5 and EAM5) were removed, reducing IRM to 2 items (IRM3, IRM4), ERM to 3 (ERM2–ERM4) and EAM to 5 items (EAM1–EAM4, EAM6). Based on modification indices, residual covariances were added between EAM1–EAM6, Angry–Bitter and PPP1–PPP2. These modifications improved the measurement-model fit, with CFI increasing from .852 to .904 and TLI from .847 to .896, while χ^2/df decreased from 3.40 to 2.88, RMSEA from .080 to .071, and SRMR from .070 to .063.

Although the fit indices improved, the solution was not

admissible. The residual variance of IAM was negative ($-.07$, $SE = .085$, $P = .413$), yielding a standardized second-order loading above unity (1.03). This Heywood case occurred in the context of substantial overlap between EAM and IAM ($HTMT = .94$). Two specifications differing only in the measurement of AM were compared on the same items: AM as a second-order factor ($df = 796$) versus a single first-order factor of the eight retained items ($df = 798$). The second-order specification showed a significant improvement in χ^2 ($\Delta\chi^2(2) = 19.93$, $P < .001$) and lower AIC and BIC values (2509.33 vs. 2525.26 and 2929.22 vs. 2937.30), while ΔCFI was only $.001$. However, because this specification produced an inadmissible Heywood solution, AM

was retained as a single first-order factor, on which all structural estimates are based.

The second-order specification of NMood was retained, its five subscales loading strongly on the higher-order factor ($\lambda = .68-.98$; $CR = .94$; $AVE = .77$). The revised six-factor measurement model, comprising 42 items, met the specified fit criteria except for TLI, which was slightly below $.90$ ($\chi^2/df = 2.90$, $CFI = .903$, $TLI = .895$, $RMSEA = .071$, $SRMR = .063$). All standardized loadings were significant ($P < .001$). The range, construct reliability and convergent validity indices are presented in Table 1. IRM and ERM showed AVE values slightly below $.50$ ($.49$ and $.46$), with CR values of $.65$ and $.70$, respectively.

Table 1. Construct reliability and convergent validity.

Construct	n items	λ range	α	CR	AVE
PMood	4	.50–.95	.82	.85	.59
IRM	2	.58–.80	.63	.65	.49
ERM	3	.51–.87	.67	.70	.46
AM	8	.64–.93	.92	.93	.62
PPP	5	.56–.84	.87	.88	.60
T	4	.55–.88	.86	.87	.64
A	4	.68–.84	.87	.86	.60
D	4	.89–.92	.94	.95	.81
F	4	.76–.96	.92	.93	.76
C	4	.64–.88	.80	.81	.53
NMood (second-order factor of T, A, D, F and C)		.68–.98	–	.94	.77

PMood = Positive Mood; IRM = Intrinsic Religious Motivation; ERM = Extrinsic Religious Motivation; AM = Academic Motivation; PPP = Perceived Physical Performance; T = Tension; A = Anger; D = Depression; F = Fatigue; C = Confusion; NMood = Negative Mood; λ = Standardized factor loading; α = Cronbach's alpha; CR = Composite Reliability; AVE = Average Variance Extracted.

Note. CR and AVE were calculated from the standardized loadings of the final model using $\theta_i = 1 - \lambda_i^2$. $CR = (\sum \lambda_i)^2 / [(\sum \lambda_i)^2 + \sum \theta_i]$ and $AVE = \sum \lambda_i^2 / [\sum \lambda_i^2 + \sum \theta_i]$. Correlated residual covariances were not included in these calculations.

At the level of the six structural constructs, HTMT ratios ranged from $.04$ to $.45$, supporting discriminant validity (Table 2).

Among the BRUMS negative subscales, HTMT ratios ranged from $.57$ to $.91$, consistent with their common higher-order NMood factor.

Table 2. Heterotrait–monotrait (HTMT) ratios among the six structural constructs.

Construct	NMood	PMood	IRM	ERM	AM	PPP
NMood	—					
PMood	.23	—				
IRM	.41	.10	—			
ERM	.12	.04	.34	—		
AM	.41	.14	.40	.09	—	
PPP	.45	.42	.27	.11	.37	—

NMood = Negative Mood; PMood = Positive Mood; IRM = Intrinsic Religious Motivation; ERM = Extrinsic Religious Motivation; AM = Academic Motivation; PPP = Perceived Physical Performance

The structural model showed the same fit indices as the final measurement model ($\chi^2/df = 2.90$, $CFI = .903$, $TLI = .895$, $RMSEA = .071$, $SRMR = .063$), and its standardized estimates are presented in Figure 2.

Table 3 below reports the unstandardized and standardized estimates, standard errors, 95% bias-corrected bootstrap confidence intervals and P values for the direct associations and mediation effects. It shows that 6 of the 12 direct associations

and 2 of the 8 mediation effects were significant.

For PPP, PMood had the strongest positive relationship ($\beta = .39$, $P < .001$), followed by a negative coefficient for NMood ($\beta = -.29$, $P = .004$) and a positive coefficient for IRM ($\beta = .19$, $P = .034$). Thus, H1, H2 and H3 were supported. ERM was not significantly related to PPP ($\beta = .02$, $P = .716$), so H4 was not supported.

For AM, NMood was negatively related to AM ($\beta = -.23$, $P = .014$), while IRM was positively related to AM ($\beta = .33$, $P =$

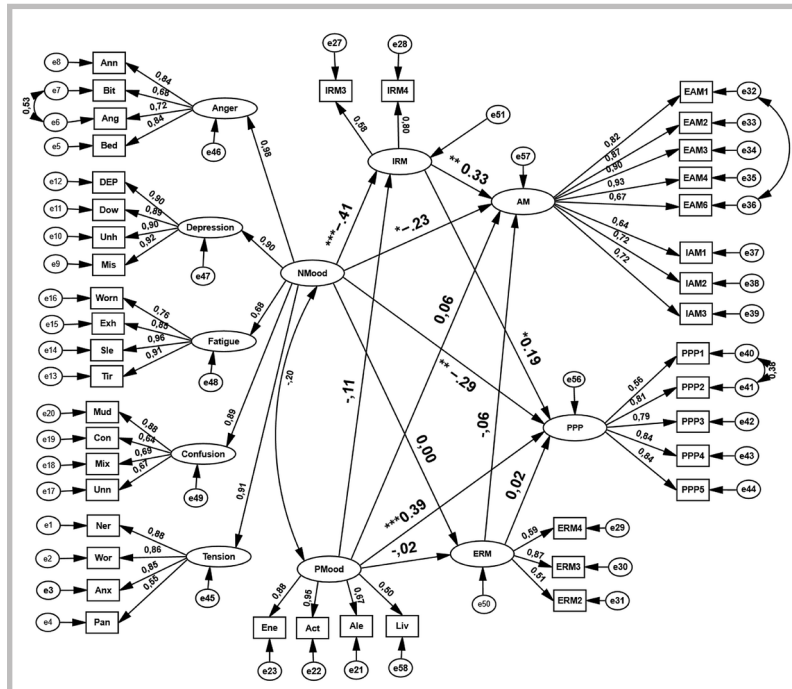


Figure 2.

.001). H5 and H7 were supported. PMood ($\beta = .06, P = .308$) and ERM ($\beta = -.06, P = .232$) were not significantly associated with AM. Thus, H6 and H8 were not supported.

For RM, NMood was negatively associated with IRM ($\beta = -.41, P < .001$), supporting H9. However, no significant association was found between NMood and ERM ($\beta = .00, P = .974$), or between PMood and IRM ($\beta = -.11, P = .239$) or ERM ($\beta = -.02, P = .699$). Therefore, H10, H11, and H12 were not supported.

For the mediation models, significant mediation through IRM was observed in the association between NMood and PPP ($b = -.048, 95\% \text{ BC CI } [-.121, -.005], P = .027, \beta = -.076$), supporting H13. A similar pattern was observed for the association between NMood and AM ($b = -.176, 95\% \text{ BC CI } [-.392, -.052], P = .001, \beta = -.135$), supporting H17. The remaining mediation paths were not significant. Thus, H14, H15, H16, H18, H19, and H20 were not supported (Table 3).

Table 3. Direct and Mediation Effects in the Final Structural Model.

Hypothesis	Relationship	b	S.E.	95% BC CI (b)	P (b)	β	95% BC CI (β)	P (β)
Direct effects								
H1	NMood $\Rightarrow$ PPP	-.185	.050	[-.282, -.087]	.005	-.29	[-.413, -.150]	.004
H2	PMood $\Rightarrow$ PPP	.279	.052	[.189, .393]	< .001	.39	[.304, .484]	< .001
H3	IRM $\Rightarrow$ PPP	.260	.170	[.031, .606]	.032	.19	[.018, .364]	.034
H4	ERM $\Rightarrow$ PPP	.013	.038	[-.058, .095]	.707	.02	[-.091, .134]	.716
H5	NMood $\Rightarrow$ AM	-.295	.122	[-.497, -.090]	.013	-.23	[-.370, -.067]	.014
H6	PMood $\Rightarrow$ AM	.092	.098	[-.075, .259]	.309	.06	[-.054, .171]	.308
H7	IRM $\Rightarrow$ AM	.952	1.036	[.408, 1.993]	.001	.33	[.135, .551]	.001
H8	ERM $\Rightarrow$ AM	-.081	.065	[-.206, .050]	.234	-.06	[-.151, .036]	.232
H9	NMood $\Rightarrow$ IRM	-.184	.057	[-.303, -.079]	< .001	-.41	[-.560, -.223]	< .001
H10	NMood $\Rightarrow$ ERM	.003	.062	[-.113, .132]	.977	.00	[-.121, .127]	.974
H11	PMood $\Rightarrow$ IRM	-.055	.046	[-.148, .030]	.228	-.11	[-.241, .093]	.239
H12	PMood $\Rightarrow$ ERM	-.026	.068	[-.162, .111]	.696	-.02	[-.148, .100]	.699
Mediation effects								
H13	NMood $\Rightarrow$ IRM $\Rightarrow$ PPP	-.048	.030	[-.121, -.005]	.027	-.076	—	—
H14	NMood $\Rightarrow$ ERM $\Rightarrow$ PPP	.000	.003	[-.005, .006]	.871	.00	—	—
H15	PMood $\Rightarrow$ IRM $\Rightarrow$ PPP	-.014	.016	[-.055, .006]	.178	-.02	—	—
H16	PMood $\Rightarrow$ ERM $\Rightarrow$ PPP	.000	.003	[-.010, .003]	.591	.00	—	—
H17	NMood $\Rightarrow$ IRM $\Rightarrow$ AM	-.176	.104	[-.392, -.052]	.001	-.135	—	—
H18	NMood $\Rightarrow$ ERM $\Rightarrow$ AM	.000	.007	[-.017, .012]	.875	.00	—	—
H19	PMood $\Rightarrow$ IRM $\Rightarrow$ AM	-.053	.072	[-.175, .027]	.185	-.03	—	—
H20	PMood $\Rightarrow$ ERM $\Rightarrow$ AM	.002	.007	[-.007, .026]	.468	.00	—	—

b = unstandardized coefficient, S.E. = bootstrap standard error, BC CI = bias-corrected confidence interval, β = standardized coefficient. NMood = negative mood, PMood = positive mood, IRM = intrinsic religious motivation, ERM = extrinsic religious motivation, AM = academic motivation, PPP = perceived physical performance.

Note: For mediation effects, inference was based on the unstandardized indirect effect (b) and its 95% BC CI, while standardized β was reported for interpretation.

Discussion

The present findings indicate that female PE students' adaptation during RF was associated with mood states and the internalization of religious meaning. PMood was positively related to PPP, while NMood was negatively related to both PPP and AM. In addition, IRM mediated the relationships involving NMood; ERM did not. This pattern highlights the importance of distinguishing affective strain from internal and external forms of religious motivation.

Relationships between MS, PPP, and AM

PMood was associated with PPP, whereas NMood was negatively associated with both PPP and AM. These results indicate that mood operated as an important psychological correlate of perceived energy, engagement in academic tasks, and physical activities during RF. Lau et al. (2023)¹², in adolescent archers, showed that RF altered both mood and performance. Trabelsi et al. (2025)⁵ reported higher fatigue and lower vigor among fasting athletes. Khemila et al. (2023)²⁴, in professional football players, showed that RF affected physical and cognitive performance across the day. Therefore, PMood was linked to greater confidence in action, whereas NMood corresponded to lower perceived availability for effort.

In this regard, the negative NMood–AM relationship reflects a cognitive-motivational pattern. Attash et al. (2025)⁸ found that Ramadan-related sleep disturbance and fatigue were associated with academic functioning among Iraqi university students. Elshoryi et al. (2025)²⁵ reported that RF affected mental health, sleep, physical activity, and body composition among university students. These findings indicate that fasting-related strain may be related not only to physical readiness but also to the mental resources required for study. In PE students, NMood may therefore be linked to lower AM in the context of fatigue, reduced concentration, and study pressure.

However, the absence of a significant PMood–AM relationship also has theoretical meaning. Mega et al. (2014)²⁶ showed that emotions, motivation, and self-regulated learning contribute to academic achievement. During RF, PMood supported physical self-evaluation, but it did not provide enough cognitive and motivational support for academic engagement.

Relationships between RM, PPP, and AM

IRM was associated with PPP and AM, whereas ERM was unrelated to both outcomes. This result suggests that students' adaptation was more closely related to religious motivation when RF was experienced as personally meaningful. Briki et al. (2015)²⁷ showed among healthy Muslims that identified religiosity was more beneficial than introjected religiosity for self-control and health-related emotions. This supports the idea that internalized religious motivation may help students interpret RF through discipline, self-regulation, and spiritual growth. Similarly, Fitouri et al. (2025)²⁸ demonstrated that the impact of RF varied according to the religious and sociocultural context, based on data collected from athletes and technical and medical staff in both Muslim and non-Muslim countries. They showed that Muslim-majority contexts can facilitate RF integration through shared routines and schedule adjustments, although planning often remains insufficient.

Moreover, Lourenço et al. (2022)²⁹ demonstrated that competence satisfaction directly predicted perceived sport performance, whereas autonomous motivation did not. Amjad et al. (2024)⁹ showed that Muslim collegiate student-athletes experienced RF as both physically demanding and spiritually meaningful. Yacoubi et al. (2026)³⁰ also showed that fasting footballers with stronger religious ritual engagement interpreted performance

constraints through resilience, discipline, and commitment.

For AM, Sulalah et al. (2025)³¹ demonstrated a connection between Islamic religiosity and learning motivation through motivational mechanisms. Khalid et al. (2020)³² also related religion to learning engagement, while Kamal and Abbas (2024)³³ described RF as a moral and educational system.

Relationships between MS and RM

NMood was negatively related to IRM but not to ERM. This result suggests that negative affect was linked to lower personal appropriation of RF without necessarily being associated with lower religious practice itself. This interpretation is consistent with Park (2021)¹⁵, who emphasized that intrinsic and extrinsic religious motives reflect different psychological orientations. It is also supported by Briki et al. (2015)²⁷, who showed that identified religiosity was more strongly related to self-control and adaptive health-related feelings than introjected religiosity. Applied to RF, higher NMood may be associated with experiencing fasting less as an internally valued act of discipline and more as a demanding condition to endure. Accordingly, ERM can persist through obligation, social expectation, or routine, even when the inner meaning attached to fasting becomes less accessible.

PMood was not related to either IRM or ERM. This result indicates that positive affect was not associated with differences in students' religious orientation during RF. Rad (2023)¹ showed that Ramadan fasting is shaped by underlying motives, suggesting that religious engagement depends on more stable motivational meanings rather than momentary affect alone. Similarly, Vandercammen et al. (2014)³⁴ showed that the relationship between emotions and intrinsic motivation depends on how individuals process positive and negative emotional experiences. Thus, feeling better during RF may be linked to greater bodily readiness, but it does not necessarily correspond to differences in the IRM or ERM through which they interpret fasting.

Mediating Role of RM between MS, PPP, and AM

IRM mediated the relationships between NMood and both PPP and AM, while ERM did not mediate any of these relationships. This pattern suggests that the association between mood and the outcomes was not reflected through religious motivation in a uniform way, as only IRM showed significant mediation involving NMood. Di Corrado et al. (2021)³⁵ explained that stress mediated the relationship between mood states and performance in elite canoe polo players. Li and Pan (2025)³⁶ also showed that mood influenced optimal sport engagement through psychological resilience and achievement motivation among football players.

Furthermore, IRM mediated the relationship between NMood and PPP. This pattern suggests that higher NMood was indirectly associated with lower PPP through lower IRM. Liu (2026)³⁷ suggested that religious practices in sport can support focus, emotional regulation, resilience, and meaning when they are integrated into athletes' personal routines. In the present study, IRM was related to the meaning students attached to fatigue, thirst, and effort during practical tasks. Accordingly, higher NMood corresponded to lower IRM and lower PPP.

IRM also mediated the relationship between NMood and AM. This indirect link indicates that NMood was related to lower AM through weaker religious meaning that gave study effort a sense of purpose during RF. Lew (2025)³⁸ argued that faith-integrated academic motivation connects learning with purpose and personal commitment. Thus, IRM may represent an important motivational resource when students interpret academic engagement during RF as an act of patience and responsibility. However, ERM did not mediate the links between MS and

either PPP or AM. This absence indicates that externally guided religious motivation did not emerge as a significant mediator of these relationships among Omani female PE students. Clark et al. (2019)³⁹ confirmed that intrinsic and extrinsic religiosity relate differently to competitive anxiety, indicating that the two forms of religiosity do not have the same psychological function. PMood also revealed no indirect effects through IRM or ERM. This result indicates that the relationship between PMood and physical self-evaluation was not mediated by either form of religious motivation. Zhang et al. (2026)⁴⁰ reported that self-confidence mediated the relationship between sport emotion and performance in martial arts athletes, showing that sport emotions influence performance through proximal sport-specific resources. Vandercammen et al. (2014)³⁴ also showed that the link between emotions and intrinsic motivation depends on how individuals differentiate positive and negative emotions. This supports the present result by suggesting that PMood alone did not activate a religious motivational pathway.

Practical Applications

This study provides practical guidance for university PE programs during RF, especially in Muslim Gulf contexts, where fasting is both a physical constraint and a culturally meaningful religious practice. The findings suggest that reducing class time alone may be insufficient to manage RF. PE programs could consider adjustments to workload, assessment scheduling, and teaching format through reducing high-intensity loads, considering alternative timing for practical examinations, and prioritizing technical learning and skill acquisition. Additionally, practical sessions closer to iftar may be worth piloting to shorten the delay between effort and recovery. Students should also receive guidance on sleep, hydration, nutrition, and recovery during non-fasting hours. For academic PE sessions, teachers should use shorter explanations, focused learning tasks, and structured activities to protect attention and AM. Regular monitoring of mood is also recommended to identify students who need physical adjustment or psychological support. The results also show that IRM, not ERM, was positively related to PPP and AM. Universities should foster a comprehensive learning environment that enables students to balance their religious practices with academic responsibilities and physical education requirements.

Study limitations

Several limitations should be acknowledged. The study is cross-sectional, so the findings and mediation results should be interpreted as statistical relationships rather than causal effects. In addition, for the female sample, future research should account for menstrual-cycle status, as hormonal variation can affect mood, fatigue, perceived exertion, and physical performance during RF. Broader comparative studies are also needed across female and male students, PE and non-PE students, and universities from different Gulf and Muslim-majority countries. Longitudinal designs before, during, and after RF, with fasting and non-fasting comparisons, would help determine whether the observed patterns in mood, RM, AM, and PPP are specific to RF. Combining perceptual measures with field-based tests and sport-specific performance assessments would provide objective indicators of students' functioning during RF. Mixed-methods studies are also recommended, as qualitative interviews can clarify students' feelings, fasting experiences, and coping strategies in greater depth.

Conclusions

This study provides an integrative SEM-based model of fasting-related adaptation among Omani female PE students. The model shows that the central issue is not RF as a timetable or workload problem but how students reconcile fasting, religious commitment, academic engagement, and practical physical performance within the same PE experience. The findings suggest that, in this Muslim context, this reconciliation related to both affective balance and internal religious meaning. Higher NMood was associated with a less favorable balance and lower personal meaning attached to RF observance. Although RF is a shared and normative practice in Muslim society, IRM was linked to discipline, purpose, and self-regulation through internally endorsed meaning. ERM, by contrast, did not provide the same personal resource for academic or physical adaptation. These findings offer practical guidance for Omani university PE programs. During RF, planning needs to align workload, assessment timing, and student monitoring with fasting-related changes in mood, fatigue, and physical condition. This approach may help reduce psychological strain, support positive mood, and help students reconcile academic engagement with practical physical participation.

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Informed Consent Statement

Informed consent was obtained from all subjects involved in the study.

Ethical Committee approval

The research protocol for studies was approved by the University Ethics Committee (Blinded for peer review).

Topic

Sport Science

Conflicts of interest

The authors have no conflicts of interest to declare.

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