

Adversity Quotient, Work–Family Conflict, and Burnout among Female Nurses: Testing the Buffering Hypothesis

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ABSTRACT

Purpose – This study tests, within Conservation of Resources (COR) theory, whether adversity quotient (AQ) is associated with job burnout among female nurses and whether AQ negatively moderates (buffers) the positive association between work–family conflict (WFC) and burnout.

Design/methodology/approach – A cross-sectional survey of 155 female nurses with an active work–family role at RSUD Abunawas, Kendari, Indonesia, used a newly developed, empirically purified instrument (38 of 50 researcher-written items retained). WFC, AQ, and burnout were modeled as second-order constructs in two-stage PLS-SEM; correlated first-order models, an independent bootstrap re-estimation, and power, influence, and robustness analyses were added. Forty-four records closely mirror earlier records and independence could not be demonstrated, so the full-sample results are provisional.

Finding/Results – WFC was positively and AQ negatively associated with burnout ($\beta = 0.485$ and $\beta = -0.355$, $p < .001$; $R^2 = 0.674$). At the dimension level, the WFC association was carried by work-interfering-with-family rather than family-interfering-with-work, most strongly for reduced personal accomplishment, and AQ was associated with exhaustion and depersonalization only. The $AQ \times WFC$ interaction was positive ($\beta = 0.153$, $p = .051$), opposite to buffering, with an interval that included zero; power was adequate only for $f^2 \geq 0.05$.

Originality/Value – The study shows direct associations of WFC and AQ with burnout but no reliable support for AQ buffering; it does not establish that buffering is absent. Findings are associational and limited by a newly developed instrument, possibly non-independent records, and limited power, and they call for replication with validated measures.

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1. Introduction

Occupational burnout has moved from being a peripheral concern of organizational psychology to a mainstream public-health issue. International surveys converge on the same picture: healthcare workers consistently rank among the occupational groups most affected by chronic work-related exhaustion, and recent umbrella evidence synthesizing dozens of systematic reviews confirms that nurse burnout is a global occupational hazard with substantial costs for patient safety, workforce retention, and healthcare quality (Edú-Valsania, Laguía, & Moriano, 2022; Getie, Ayenew, Amlak, Gedfew, Edmealem, & Kebede, 2025; Muir, Wanchek, & Lobo, 2022). Within this picture, female nurses occupy a particularly precarious position: as the profession remains female-dominated in most health systems, women in nursing simultaneously absorb the emotional and physical demands of frontline clinical work and the culturally reinforced expectation that they remain the principal caregivers within their own households (Diao, Chen, Zhong, & Zhang, 2024; Dousin, Collins, & Kler, 2022).

The tension between these two role sets is captured by the construct of work–family conflict (WFC), a form of inter-role conflict in which participation in the work domain and participation in the family domain become mutually incompatible. Nursing studies report positive associations between WFC and burnout among emergency nurses in China (Diao et al., 2024) and among nurses in Iran during the COVID-19 pandemic (Yarifard et al., 2023), and work–family strain has also been documented among nurses in Malaysia and Korea (Dousin et al., 2022; Hwang & Yu, 2021). What remains less settled is which individual-level psychological resources, if any, are associated with a weaker WFC–burnout link.

One construct that has attracted interest as a candidate personal resource is adversity quotient (AQ), an individual's characteristic pattern of responding to adversity along four dimensions abbreviated as CO2RE: control, ownership, reach, and endurance. Studies of AQ in health-related settings have often involved students and interns (Gou et al., 2024; Liu & Wang, 2023; Suksatan et al., 2021). Among nurses, AQ has been negatively associated with work stress (Luo et al., 2025) and positively associated with professional pride (Xu et al., 2024), and in other working populations it has been linked to career success (Zhao & Sang, 2023). A recent systematic review concluded that AQ is an important determinant of mental health and professional quality of life among healthcare professionals (Saxena & Rathore, 2025). Among the studies we reviewed, none tested AQ as a moderator of the WFC–burnout association.

This gap is theoretically consequential. Conservation of Resources (COR) theory (Hobfoll, Halbesleben, Neveu, & Westman, 2018) proposes that individuals strive to protect, retain, and build resources, and that stress emerges when resources are threatened, lost, or fail to yield an adequate return on investment. Personal resources such as AQ are typically theorized to function as buffers that weaken the strength of the relationship between a stressor and a strain outcome. Yet recent refinements of COR theory caution against assuming that every personal resource behaves as a buffer under all conditions; resource investment can operate independently of, rather than interrupting, resource-loss spirals (Bakker, Demerouti, & Sanz-Vergel, 2023; Sonnentag & Meier, 2024). Whether AQ genuinely moderates the WFC–burnout relationship, or instead behaves as an antecedent that predicts burnout in its own right, is

therefore an open empirical question with direct implications for how COR theory should be extended to healthcare occupations.

A further gap concerns setting. The recent nursing studies on WFC and burnout or on AQ cited above come from China and Iran rather than from a regional Indonesian hospital (Diao et al., 2024; Luo et al., 2025; Yarifard et al., 2023). RSUD Abunawas, a regional public hospital in Kendari City, Southeast Sulawesi, Indonesia, offers such a setting, although a single hospital limits generalization.

The public-health stakes are considerable. Chronic burnout among nurses is associated with turnover and its costs (Muir et al., 2022) and with poorer working conditions and well-being across health systems (Getie et al., 2025). Identifying which individual-level resources are associated with lower burnout, and whether they also condition the association of role conflict with burnout, is therefore relevant to the design of occupational-wellbeing programs for nursing staff.

This study makes three contributions. First, unlike studies that treat AQ only as a direct predictor, it states and tests a directional buffering hypothesis for AQ, reporting the sign, confidence interval, conditional slopes, power, and influence diagnostics of the interaction rather than only its p-value. Second, it models WFC, AQ, and burnout as multidimensional second-order constructs and reports the measurement model in full, including removed items and a discriminant-validity concern. Third, it extends the AQ literature, which is concentrated in students and interns, to practicing female nurses in a regional public hospital in Southeast Sulawesi, a setting that has received little attention.

Against this backdrop, the study addresses three research questions: (1) Is WFC positively associated with job burnout among female nurses? (2) Is AQ negatively associated with job burnout? (3) Does AQ negatively moderate the positive WFC–burnout association, such that the association is weaker at higher AQ? These questions are tested with two-stage PLS-SEM.

2. Literature Review & Hypothesis Development

2.1 Conservation of Resources Theory as the Overarching Framework

A central and often under-appreciated corollary of COR theory is the notion of resource caravans: resources rarely operate in isolation but travel together in interrelated clusters, such that possessing one valued resource (for instance, a stable, high-control appraisal style) tends to co-occur with, and mutually reinforce, other valued resources (for instance, social support, professional confidence, or a sense of occupational meaning). This caravan logic has two direct implications for the present study. First, it suggests that a construct such as adversity quotient should not be understood as a narrow coping tactic but as a broader disposition that shapes how an individual engages with the full range of resource-relevant experiences encountered at work and at home. Second, it implies that resource loss and resource gain unfold as spirals rather than isolated events: an initial loss of resources (for example, an episode of unresolved WFC) can trigger a downward spiral in which subsequent losses become easier and gains become harder, while an initial resource gain can trigger an upward spiral in which subsequent gains accumulate more readily. Whether AQ is positioned to interrupt a loss spiral already in motion (a moderating function) or simply to determine the individual's starting

position on the resource ladder (an antecedent function) is precisely the theoretical question this study is designed to adjudicate.

COR theory holds that individuals are motivated to acquire, protect, and retain valued resources, and that psychological stress arises when resources are threatened, actually lost, or when substantial resource investment fails to generate an adequate return (Hobfoll et al., 2018). Contemporary refinements relevant to this study come from two directions. First, the Job Demands–Resources tradition distinguishes job demands that drain energy from job and personal resources that can offset this drain, while cautioning that a resource's buffering function is conditional rather than automatic (Bakker et al., 2023; Bon & Shire, 2022). Second, recent theoretical audits of COR emphasize that gain and loss processes should not be assumed to interact in a simple buffering pattern; a personal resource can predict an outcome directly while failing to alter the strength of a separate stressor–outcome relationship, particularly when the resource and the stressor operate through partially independent pathways (Liao, Huang, & Hu, 2022; Sonnentag & Meier, 2024). This nuance provides the conceptual scaffolding for the study's three hypotheses.

2.2 Work–Family Conflict and Job Burnout

WFC captures the bidirectional strain arising when the demands of paid employment and family life compete for finite time, energy, and attention. From a resource-based perspective, WFC represents a chronic drain on psychological and physical resources, an account that is consistent with its association with burnout (Liao, Lau, Hui, & Kong, 2019). Positive WFC–burnout associations have been reported among Chinese emergency nurses (Diao et al., 2024) and Iranian nurses during the COVID-19 pandemic (Yarifard et al., 2023); WFC has also been linked to other strain outcomes, including work–life balance difficulties among Malaysian women doctors and nurses (Dousin et al., 2022) and poorer sleep and depressive symptoms among Korean married female nurses (Hwang & Yu, 2021).

The two WFC directions combined in the second-order construct are conceptually distinct: work-interfering-with-family (WIF) concerns the spillover of job demands into home life, whereas family-interfering-with-work (FIW) concerns the spillover of family demands into work, and the two need not relate to strain equally. We model them as one bidirectional construct for parsimony and examine them separately in a robustness analysis (Section 4.5.3). H1: Work–family conflict is positively associated with job burnout among female nurses.

2.3 Adversity Quotient and Job Burnout

AQ describes an individual's characteristic pattern of interpreting and responding to adverse circumstances across four dimensions: control, ownership, reach, and endurance (Saxena & Rathore, 2025). Within a COR framework, AQ can be understood as a personal resource that may determine how efficiently adverse experiences are absorbed. Nursing studies are compatible with this view: AQ is negatively associated with work stress among Chinese hospital nurses, partly through professional identity (Luo et al., 2025), is associated with greater professional pride among nurses in high-intensity units (Xu et al., 2024), and is related to depression and coping among nursing students and interns (Gou et al., 2024; Liu & Wang, 2023). AQ has also been examined in relation to compassion fatigue among medical frontliners (Podador et al., 2024) and burnout among surgical physicians (Ostryakova et al., 2023). A

systematic review of AQ among healthcare professionals identified it as an important determinant of mental health and professional quality of life (Saxena & Rathore, 2025).

H2: Adversity quotient is negatively associated with job burnout among female nurses.

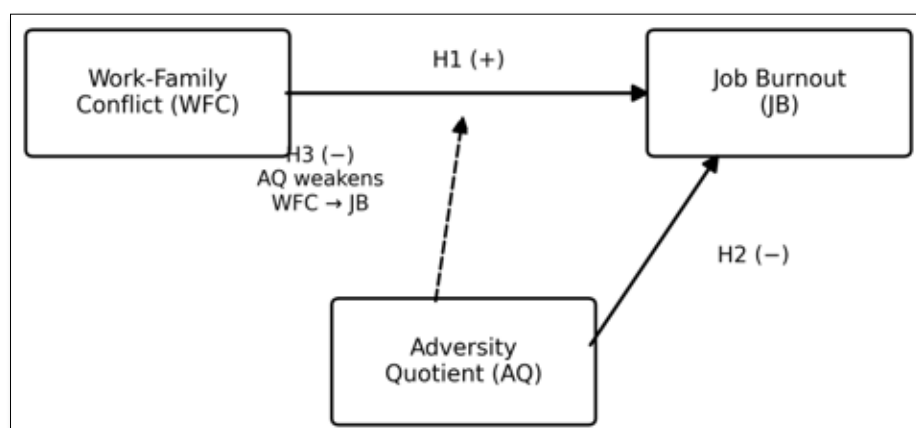
2.4 The Moderating Role of Adversity Quotient

Beyond its direct protective function, AQ is frequently theorized, though considerably less frequently tested, as a boundary condition that weakens the strength of the relationship between an external stressor and a strain outcome: an employee with higher AQ should translate a given level of WFC into a smaller increment of burnout than an employee with lower AQ. This logic is broadly consistent with the wider personal-resources literature within the JD-R tradition (Bakker et al., 2023). However, an emerging strand of theoretical commentary cautions that this buffering pattern should not be assumed to generalize automatically to every personal resource and every stressor. Because WFC may deplete resources that are structurally distinct from those governed by AQ — WFC principally erodes discretionary time and role-specific energy, whereas AQ principally governs the interpretive and emotional-regulation response to adversity once it has occurred — AQ could exert a strong direct effect on burnout while failing to significantly weaken the WFC–burnout pathway itself, effectively behaving as an antecedent rather than a genuine moderator (Liao et al., 2022; Sonnentag & Meier, 2024). Because the empirical nursing literature has not resolved which pattern holds, the moderation hypothesis is tested rather than assumed.

H3: Adversity quotient negatively moderates the positive association between work–family conflict and job burnout, such that the association is weaker at higher levels of AQ (i.e., the $AQ \times WFC$ interaction coefficient is negative).

Figure 1 summarizes the hypothesized research model. WFC (a second-order reflective construct comprising work-interfering-with-family and family-interfering-with-work) is modeled as the exogenous predictor of job burnout (a second-order reflective construct comprising emotional exhaustion, depersonalization, and reduced personal accomplishment). AQ (a second-order reflective construct comprising control, ownership, reach, and endurance) is modeled simultaneously as a direct predictor of job burnout and as a moderator of the WFC–burnout path.

Figure 1. Conceptual Research Model: H1 ($WFC \rightarrow JB, +$), H2 ($AQ \rightarrow JB, -$), H3 (AQ negatively moderating $WFC \rightarrow JB$)



Source: Developed by the authors, 2026.

2.5 Summary of Hypotheses

Table 1 summarizes the three hypotheses developed above, together with their theoretical rationale within COR theory and their primary supporting sources. This summary is intended to make explicit, prior to the presentation of results, that H1 and H2 rest on a relatively convergent and consistent body of prior evidence, whereas H3 is deliberately framed as an open empirical test rather than a foregone conclusion, consistent with the theoretical ambiguity discussed in Section 2.4.

Table 1. Summary of Hypotheses and Theoretical Rationale

Hypothesis	Statement	Theoretical Rationale (COR Theory)
H1	WFC is positively associated with job burnout.	WFC represents a chronic drain on time, energy, and attention across two competing role domains, accelerating resource depletion and, in turn, burnout.
H2	AQ is negatively associated with job burnout.	AQ functions as a personal resource that governs how efficiently adverse experiences are metabolized, limiting resource loss per unit of adversity encountered.
H3	AQ negatively moderates the WFC–burnout association (interaction < 0).	As a personal resource, AQ is theorized to buffer resource loss triggered by an external stressor (WFC), which implies a weaker WFC–burnout association at higher AQ.

Source: Developed by the authors, 2026.

3. Methodology

3.1 Research Design, Context, and Sampling

This study used a cross-sectional quantitative survey with an explanatory (associational) and predictive aim, conducted at RSUD Abunawas, a regional public general hospital in Kendari City, Southeast Sulawesi, Indonesia, between March and August 2026. The setting was chosen purposively as a regional public hospital in which nursing staff combine clinical work with domestic responsibilities. The target population was female nurses at the hospital with an active work–family role, i.e., who were married and/or had an active family-caregiving responsibility; this is a subset of the hospital’s female nursing workforce. Neither the total headcount of female nurses nor the number meeting the work–family criterion was recorded. Because the study used non-probability purposive sampling and a power-based minimum sample size (below) rather than a fixed sampling fraction, coverage of the target population cannot be quantified, and generalization beyond this hospital is not claimed.

Eligibility followed the original study protocol: respondents were female nurses at the hospital who were married and/or held an active family-caregiving responsibility, with a minimum

tenure of one year specified as a recruitment guideline. In the final dataset, 91.6% ($n = 142$) were married and 8.4% ($n = 13$) were unmarried with caregiving responsibilities, and 13 respondents (8.4%) had less than one year of tenure. The screening records needed to establish how these 13 respondents were admitted were not available; they were retained, and tenure is treated as a sample characteristic rather than an applied eligibility rule. The sample is therefore described throughout as female nurses with an active work–family role rather than as married nurses. The data file contains item responses in row order only; it holds no questionnaire identifiers, collection dates, nursing-unit information, or administration batches, so respondent provenance and independence cannot be documented from it (Section 4.5.3).

The minimum sample size for the structural paths was determined with the inverse square root and gamma-exponential heuristics for PLS-SEM (Kock & Hadaya, 2018) and power guidelines for PLS-SEM (Hair et al., 2022), assuming 80% power, a 5% significance level, and a minimum path coefficient of 0.11–0.20, which indicated at least 155 respondents. The 155 complete questionnaires analyzed exactly meet this minimum. This heuristic concerns the main paths; power for the $AQ \times WFC$ interaction was evaluated separately (Section 4.5.2).

Questionnaires were closed-ended and distributed directly to respondents; the number distributed and the response rate were not recorded. The study was conducted under a research certificate letter (Surat Keterangan Penelitian No. 000.9.2/73/2026) issued by the National Unity and Politics Agency (Badan Kesatuan Bangsa dan Politik) of the Kendari City Government. This letter grants permission to conduct research but is not an ethical-review approval, and the study records contain no approval from an ethical-review committee; the informed-consent and anonymity procedures used are also not documented. We therefore report the absence of formal ethical clearance as a limitation (Section 6) and recommend that follow-up studies obtain it before data collection.

3.2 Measures

All constructs were measured with closed-ended five-point Likert items (1 = strongly disagree to 5 = strongly agree) written in Bahasa Indonesia by the research team. The dimensional structure follows Arsanias and Supartha (2020) for WFC (work-interfering-with-family and family-interfering-with-work; six items each), Stoltz's CO2RE framework as operationalized in Saxena and Rathore (2025) for AQ (control, ownership, reach, and endurance; five items each), and the three-dimensional burnout structure reviewed by Edú-Valsania et al. (2022) (emotional exhaustion, depersonalization, and reduced personal accomplishment; six items each), giving 50 items. The items are researcher-developed and are not verbatim items of an established, previously validated questionnaire. The study records document neither a formal expert content-validity review nor a pilot test. No item was reverse-scored: all items are worded so that higher scores indicate more of the construct, including reduced personal accomplishment. The Indonesian items with English translations are given in Supplementary Material S1. The analysis is therefore based on an empirically purified, newly developed instrument. Validity evidence rests solely on the PLS-SEM measurement assessment in Section 4.3, which was computed after data-driven item deletion and does not validate the original 50-

item instrument, so the structural findings should not be treated as definitive evidence about the theoretical constructs.

3.3 Operational Definition of Variables

Table 2 lists the dimensions of each construct, the number of items written and retained, and one example item per dimension (English translation of the Indonesian item).

Table 2. Operational Definition of Variables

Construct	Dimension	Example item (English translation)	Items written / retained	Dimension source
Work–Family Conflict (WFC)	Work interfering with family	My job often leaves me without enough time for my family. (WIF1)	6 / 5	Arsania & Supartha (2020)
	Family interfering with work	Family responsibilities sometimes disrupt my concentration at work. (FIW1)	6 / 5	
Adversity Quotient (AQ)	Control	I can stay calm when facing difficult work situations. (C1)	5 / 4	Stoltz CO2RE; Saxena & Rathore (2025)
	Ownership	I take responsibility for the consequences of my decisions. (O1)	5 / 4	
	Reach	I can separate work problems from my personal life. (R1)	5 / 4	
	Endurance	I am confident that every difficulty I face is temporary. (E1)	5 / 4	
Job Burnout (JB)	Emotional exhaustion	I feel emotionally exhausted because of my work. (EX1)	6 / 4	Edú-Valsania et al. (2022)
	Depersonalization	I feel I have become less concerned about my work than before. (D1)	6 / 5	
	Reduced personal accomplishment	I feel less successful in carrying out my job tasks. (RPA1)	6 / 3	
Total			50 / 38	

Source: Developed by the authors from the questionnaire in the source study, 2026.

3.4 Data Analysis Technique

Data were analyzed with PLS-SEM in SmartPLS 4 (Hair et al., 2022). The three constructs were specified as reflective second-order constructs and estimated with the two-stage approach: first-order dimension scores were estimated with repeated indicators and then used as indicators of the second-order constructs. The measurement model was evaluated through indicator loadings, Cronbach's alpha, composite reliability, and AVE, and discriminant validity through the heterotrait–monotrait ratio (HTMT; Henseler et al., 2015), the Fornell–Larcker criterion, and cross-loadings. The structural model was evaluated through R^2 , f^2 , Q^2 (blindfolding), PLSpredict, and bootstrapped path significance (SmartPLS output: original estimate, standard deviation, t , and p ; the number of bootstrap subsamples was not recorded in the study files). The structural relations are expressed in Equation (1):

$$JB = \alpha + \beta_1 WFC + \beta_2 AQ + \beta_3 (AQ \times WFC) + \varepsilon \quad (1)$$

where JB is job burnout, WFC is work–family conflict, AQ is adversity quotient, $(AQ \times WFC)$ is the interaction term representing the hypothesized moderation effect, α is the constant, β_1 – β_3 are path coefficients, and ε is the error term.

The interaction term was the product of the standardized latent scores of AQ and WFC, and H3 was evaluated as a directional hypothesis (negative interaction). The moderator typology of Sharma et al. (1981) was applied as a descriptive classification. Because SmartPLS did not export several statistics requested during review, the entire two-stage procedure was also re-estimated on the raw item data with an independent implementation of the PLS algorithm (mode A, path weighting; Python), and percentile and bias-corrected and accelerated (BCa) intervals were obtained from 5,000 bootstrap resamples (seed 20260926). This re-estimation reproduces the SmartPLS results closely (e.g., interaction $\beta = 0.154$ vs. 0.153 and $f^2 = 0.116$ vs. 0.116) but is not identical, and the SmartPLS output remains the primary source of point estimates. Further analyses were structural and full-collinearity VIFs and Harman's single-factor test for common method bias (Kock, 2015), a sensitivity analysis of power for the interaction, influence diagnostics, and robustness checks (Section 4.5). The structural model was also estimated with correlated first-order dimensions (WIF, FIW, and AQ as predictors; each burnout dimension as a separate outcome) and compared with the second-order model by R^2 and ten-fold cross-validated RMSE (Section 4.5.4).

4. Result and Discussion

4.1 Respondent Profile

Of the 155 female nurse respondents, the majority (73.5%, $n = 114$) were aged between 31 and 40 years, followed by 14.8% ($n = 23$) aged 21–30, 11.0% ($n = 17$) aged 41–50, and 0.6% ($n = 1$) older than 50. Regarding marital status, 91.6% ($n = 142$) were married and 8.4% ($n = 13$) were unmarried but reported active family caregiving responsibilities. In terms of caregiving load, 49.7% ($n = 77$) had one to two children, 34.8% ($n = 54$) had three to four children, 9.7% ($n = 15$) had no children, and 5.8% ($n = 9$) had five or more children. Regarding organizational tenure, 47.7% ($n = 74$) had worked one to five years, 34.2% ($n = 53$) six to ten years, 9.7% ($n = 15$) more than ten years, and 8.4% ($n = 13$) less than one year — this last group, as explained in Section 3.1, was retained because tenure was applied only as a general recruitment guideline rather

than a strict exclusion rule. This profile confirms that the sample predominantly comprised experienced nurses of prime working and childbearing age with an active work–family role, whether through marriage or an active caregiving responsibility.

Table 3. Respondent Demographic Profile (N = 155)

Characteristic	Category	n	%
Age	21–30 years	23	14.8
	31–40 years	114	73.5
	41–50 years	17	11.0
	>50 years	1	0.6
Marital status	Married	142	91.6
	Unmarried (with caregiving role)	13	8.4
Number of children	None	15	9.7
	1–2	77	49.7
	3–4	54	34.8
	≥5	9	5.8
Tenure	<1 year	13	8.4
	1–5 years	74	47.7
	6–10 years	53	34.2
	>10 years	15	9.7

Source: Primary data, 2026.

4.2 Descriptive Statistics of the Study Variables

Table 4 reports descriptive statistics for dimension and construct scores computed from all 50 original items. Respondents reported low WFC ($M = 2.02$, $SD = 0.44$) and low burnout ($M = 1.91$, $SD = 0.38$) and high AQ ($M = 4.19$, $SD = 0.38$). Observed ranges were narrow: on the five-point scale, construct scores never exceeded 3.25 for WFC or 3.06 for burnout and never fell below 3.20 for AQ; 56.1% of respondents scored 2 or lower on WFC, 64.5% scored 2 or lower on burnout, and 72.9% scored 4 or higher on AQ. Skewness and kurtosis of construct and dimension scores were modest (largest for reduced personal accomplishment: skewness 0.83, excess kurtosis 1.53), although 10 of the 50 individual items had absolute skewness above 1. This restricted range, together with possible social-desirability or self-presentation effects in a single-hospital self-report survey, limits the variance available for detecting interactions (Section 4.5.2). Histograms of the three construct scores are given in Supplementary Material S4.

Table 4. Descriptive Statistics of Study Variables (N = 155)

Variable / dimension	M	SD	Min–Max	Skewness	Kurtosis
Work–Family Conflict (overall)	2.02	0.44	1.00–3.25	0.02	0.16
Work interfering with family	2.00	0.48	1.00–3.17	-0.05	0.02
Family interfering with work	2.04	0.50	1.00–3.33	0.46	0.49
Adversity Quotient (overall)	4.19	0.38	3.20–4.90	0.03	-0.40
Control	4.16	0.50	2.80–5.00	-0.15	-0.49
Ownership	4.19	0.44	2.80–5.00	-0.36	0.09
Reach	4.21	0.43	3.00–5.00	-0.24	-0.22
Endurance	4.19	0.44	3.00–5.00	0.19	-0.42
Job Burnout (overall)	1.91	0.38	1.11–3.06	0.20	0.10
Emotional exhaustion	1.91	0.47	1.00–3.17	0.17	-0.28
Depersonalization	1.89	0.48	1.00–3.17	0.15	-0.31
Reduced personal accomplishment	1.94	0.41	1.00–3.50	0.83	1.53

Source: Computed from the raw item data (all 50 items), 2026. Means differ by at most 0.01 from the rounded values printed in the source study.

4.3 Measurement Model Assessment

Measurement-model evaluation followed the two-stage procedure for reflective second-order constructs. Of the 50 items written, 12 were removed because their first-run outer loadings were below 0.70 (Table 5): one item from each AQ dimension (4 items), one from each WFC dimension (2 items), and six burnout items (two from emotional exhaustion, one from depersonalization, three from reduced personal accomplishment); 38 items were retained. Eleven of the twelve removed items had loadings from slightly negative (-0.19) to slightly positive (0.13), i.e., essentially unrelated to their own dimension, and one (EX3) had a loading of 0.61. All removed items except EX3 were the last item(s) of their questionnaire block. Incorrect reverse-scoring would produce strongly negative rather than near-zero loadings, and no item was reverse-scored, so scoring direction does not explain the pattern; shifting the data column by one to four rows did not restore the correlations either. The authors compared the data file with the original paper questionnaires and found the entries to match, so the pattern reflects the responses as recorded; we could not establish its cause. Content coverage of reduced personal accomplishment is most affected (three of six items removed), so the burnout construct as measured may differ from the intended one; sensitivity analyses that keep all 50 items are reported in Section 4.5.3.

Table 5. Indicators Removed in the First-Order Measurement Model

Code	Dimension	Item (English translation)	First-run loading
C5	Control (AQ)	In unpleasant conditions, I am still able to control my actions.	0.123
O5	Ownership (AQ)	I regard every difficulty as part of a responsibility I must resolve.	-0.134
R5	Reach (AQ)	I can keep my focus on other tasks even when under pressure.	-0.191
E5	Endurance (AQ)	I do not give up easily when facing heavy challenges.	-0.071
WIF6	Work interfering with family	My job often makes me miss important moments with my family.	-0.094
FIW6	Family interfering with work	Certain family conditions make me less than optimal in carrying out my job tasks.	-0.090
EX3	Emotional exhaustion	I feel mentally tired when facing job demands.	0.608
EX6	Emotional exhaustion	I find it hard to stay motivated at work because of the fatigue I feel.	-0.022
D6	Depersonalization	I feel interpersonal relationships at work have become less important to me.	0.045
RPA4	Reduced personal accomplishment	I feel my work productivity has declined.	0.125
RPA5	Reduced personal accomplishment	I feel less confident in facing job demands.	-0.152
RPA6	Reduced personal accomplishment	I feel my work achievements are not as good as I expected.	0.125

Source: Indonesian questionnaire of the source study (translated by the authors); first-run loadings from the independent re-estimation with all 50 items (SmartPLS first-run values ranged from -0.193 to 0.125, and 0.608 for EX3).

Table 6. First-Order Measurement Model: Retained Items, Reliability, and Validity

Construct	Dimension	Item	Loading	α	CR (qc)	AVE
Adversity Quotient	Control	C1–C4	0.838–0.919	0.900	0.930	0.770
	Ownership	O1–O4	0.800–0.870	0.861	0.905	0.705
	Reach	R1–R4	0.769–0.876	0.838	0.892	0.674
	Endurance	E1–E4	0.790–0.850	0.841	0.893	0.677
Work–Family Conflict	Work Interfering with Family	WIF1–WIF5	0.768–0.918	0.911	0.934	0.740
	Family Interfering with Work	FIW1–FIW5	0.726–0.846	0.855	0.890	0.619
Job Burnout	Emotional Exhaustion	EX1,2,4,5	0.805–0.855	0.856	0.902	0.698
	Depersonalization	D1–D5	0.755–0.868	0.859	0.899	0.641
	Reduced Personal Accomplishment	RPA1–RPA3	0.812–0.894	0.807	0.886	0.722

Source: SmartPLS 4 output, processed data, 2026. Notes: item ranges report the lowest and highest retained loading per dimension; α = Cronbach's alpha; CR = composite reliability; AVE = average variance extracted. Item-by-item content is in Supplementary Material S1.

The 38 retained items loaded at 0.726 or higher, and every dimension exceeded the conventional thresholds for reliability (Cronbach's alpha, composite reliability) and AVE (Table 6). These statistics were computed after data-driven deletion of 12 items and describe only the retained item set; they should not be read as validation of the original 50-item instrument, and they are likely to be optimistic relative to it. The first-order dimension scores were then used as indicators of the second-order constructs (Table 7).

Table 7. Second-Order Measurement Model: Outer Loadings, Reliability, and Validity

Construct	Dimension	Loading	α	CR (qc)	AVE
Adversity Quotient (AQ)	Control	0.861	0.897	0.928	0.764
	Ownership	0.865			
	Reach	0.862			
	Endurance	0.907			
Work–Family Conflict (WFC)	Work Interfering with Family	0.946	0.840	0.925	0.860
	Family Interfering with Work	0.909			
Job Burnout (JB)	Emotional Exhaustion	0.867	0.835	0.900	0.751
	Depersonalization	0.902			
	Reduced Personal Accomplishment	0.828			

Source: SmartPLS 4 output, processed data, 2026.

The reflective–reflective specification was chosen because Stoltz’s CO2RE framework treats control, ownership, reach, and endurance as expressions of one adversity-response disposition, and Maslach’s tripartite model treats exhaustion, depersonalization, and reduced accomplishment as facets of one burnout syndrome. The case is weaker for WFC, whose two directions are conceptually distinct, and for burnout, whose dimensions may relate differently to antecedents. Two empirical results support this concern: when the two WFC directions were entered separately, work-interfering-with-family was associated with burnout whereas family-interfering-with-work was not (Section 4.5.3), and reduced personal accomplishment cross-loads strongly on WFC (Table 10). The second-order specification is therefore a modeling choice rather than an established structure. It is compared with a correlated first-order model in Section 4.5.4, which shows that conclusions about H1 and H2 are qualified by the choice, whereas the conclusion about H3 is not.

Discriminant validity was assessed with HTMT, the Fornell–Larcker criterion, and cross-loadings (Tables 8–10). The HTMT between WFC and burnout (0.864 in SmartPLS; 0.866 in the re-estimation) is below 0.90 but above the stricter 0.85 criterion, and its bootstrap interval reaches 0.97 (BCa upper limit 0.96), close to 1 (Henseler et al., 2015). Reduced personal accomplishment loads 0.828 on burnout but 0.814 on WFC, a margin of only 0.014. Discriminant validity between WFC and burnout is therefore supported only under the liberal criteria, and we treat it as a present validity concern.

Table 8. Discriminant Validity: Heterotrait–Monotrait Ratio (HTMT)

Construct pair	HTMT (SmartPLS)	HTMT (re- estimation)	95% percentile CI	95% BCa CI
AQ – Job Burnout	0.815	0.813	[0.694, 0.900]	[0.686, 0.897]
AQ – WFC	0.805	0.813	[0.718, 0.888]	[0.721, 0.889]
WFC – Job Burnout	0.864	0.866	[0.723, 0.970]	[0.689, 0.959]

Source: SmartPLS 4 output (first column) and independent bootstrap re-estimation with 5,000 resamples (other columns), 2026. Criteria: below 0.85 (conservative) or 0.90 (liberal); an upper confidence limit below 1 supports discriminant validity.

Table 9. Discriminant Validity: Fornell–Larcker Criterion

Construct	Adversity Quotient	Job Burnout	Work–Family Conflict
Adversity Quotient	0.874		
Job Burnout	-0.710	0.866	
Work–Family Conflict	-0.698	0.755	0.927

Source: SmartPLS 4 output, processed data, 2026. Diagonal values (bold in the original output) are the square root of AVE; each exceeds the construct's correlations with other constructs, supporting discriminant validity.

Table 10. Discriminant Validity: Cross-Loadings

Dimension	Adversity Quotient	Job Burnout	Work–Family Conflict
Control (AQ)	0.861	-0.610	-0.657
Ownership (AQ)	0.865	-0.607	-0.564
Reach (AQ)	0.862	-0.604	-0.583
Endurance (AQ)	0.907	-0.661	-0.634
Work Interfering with Family (WFC)	-0.645	0.777	0.946
Family Interfering with Work (WFC)	-0.652	0.605	0.909
Emotional Exhaustion (JB)	-0.572	0.867	0.507
Depersonalization (JB)	-0.667	0.902	0.588
Reduced Personal Accomplishment (JB)	-0.599	0.828	0.814

Source: SmartPLS 4 output, processed data, 2026. Each dimension loads most strongly on its intended construct, but reduced personal accomplishment loads 0.828 on burnout and 0.814 on WFC.

Outer VIF values (dimension-level indicators within each second-order construct) ranged from 1.479 to 3.297, and structural VIF values for the predictors of burnout in the moderated

model (independent re-estimation) were 1.93 (WFC), 1.92 (AQ), and 1.01 (AQ $\times$ WFC); all are below 5 and 3.3 (Table 11).

Table 11. Collinearity Statistics (VIF)

Level	Construct / dimension	VIF
Outer (dimension indicators)	Control (AQ)	2.305
	Ownership (AQ)	2.392
	Reach (AQ)	3.079
	Endurance (AQ)	2.437
	Work interfering with family (WFC)	2.101
	Family interfering with work (WFC)	2.101
	Emotional exhaustion (JB)	3.023
	Depersonalization (JB)	3.297
	Reduced personal accomplishment (JB)	1.479
Structural (predictors of JB)	WFC	1.93
	AQ	1.92
	AQ $\times$ WFC	1.01

Source: Outer VIF from SmartPLS 4 output; structural VIF from the independent re-estimation, 2026.

4.4 Structural Model and Hypothesis Testing

The structural model explained 67.4% of the variance in burnout ($R^2 = 0.674$; Table 14). In SmartPLS (Table 12), WFC was positively associated with burnout ($\beta = 0.485$, $t = 7.115$, $p < .001$; H1 supported) and AQ negatively associated ($\beta = -0.355$, $t = 4.621$, $p < .001$; H2 supported). The AQ $\times$ WFC interaction was positive ($\beta = 0.153$, $t = 1.952$, $p = .051$), opposite to the sign H3 required, so H3 is not supported. SmartPLS did not export confidence intervals, so Table 13 reports bootstrap standard errors and percentile and BCa intervals from an independent re-estimation (5,000 resamples). Its estimates are close to, but not identical with, the SmartPLS values, and the interaction interval includes zero. These intervals were not generated by SmartPLS.

Table 12. Structural Path Coefficients and Hypothesis Testing (SmartPLS 4)

Hypothesized path	β	SD	t-value	p-value	Decision
H1: WFC $\rightarrow$ Job Burnout (+)	0.485	0.068	7.115	0.000	Supported
H2: AQ $\rightarrow$ Job Burnout (-)	-0.355	0.077	4.621	0.000	Supported
H3: AQ $\times$ WFC $\rightarrow$ Job Burnout (expected -)	0.153	0.078	1.952	0.051	Not supported (positive sign)

Source: SmartPLS 4 bootstrap output (original sample, standard deviation, t-statistic, p-value), 2026.

Table 13. Independent Bootstrap Re-Estimation (5,000 Resamples)

Parameter	Estimate	Bootstrap SE	95% percentile CI	95% BCa CI
WFC → Job Burnout	0.474	0.068	[0.353, 0.619]	[0.319, 0.591]
AQ → Job Burnout	-0.365	0.078	[-0.511, -0.203]	[-0.506, -0.199]
AQ × WFC → Job Burnout	0.154	0.083	[-0.045, 0.277]	[-0.021, 0.304]
R ² (Job Burnout)	0.668	0.036	[0.612, 0.754]	[0.580, 0.724]
f^2 (AQ × WFC)	0.116	0.134	[0.000, 0.481]	[0.001, 0.579]

Source: Independent re-estimation of the two-stage PLS-SEM model on the raw item data, 2026. Bootstrap p for the interaction = .064; 92.2% of bootstrap interaction estimates were positive.

Effect sizes follow Cohen's benchmarks as used in PLS-SEM (0.02 small, 0.15 medium, 0.35 large; Hair et al., 2022): WFC → burnout f^2 = 0.368 (large), AQ → burnout f^2 = 0.198 (medium), and AQ × WFC f^2 = 0.116 (small). The bootstrap interval for the interaction f^2 was very wide ([0.000, 0.481]; Table 13), so this effect size is imprecisely estimated.

Table 14. Structural Model Summary: R², Q², and Effect Sizes (f^2)

Metric	Value	Interpretation
R ² (Job Burnout)	0.674	Moderate-to-substantial
Q ² (Job Burnout, blindfolding)	0.625	High predictive relevance
f^2 — WFC → Job Burnout	0.368	Large
f^2 — AQ → Job Burnout	0.198	Medium
f^2 — AQ × WFC → Job Burnout	0.116	Small

Source: SmartPLS 4 output, processed data, 2026. Effect-size categories follow Cohen's f^2 benchmarks as adapted for PLS-SEM by Hair et al. (2022).

PLSpredict compared the out-of-sample errors of the PLS-SEM model with a linear-model (LM) benchmark for the three lower-order components (dimensions) of burnout (Table 15). Emotional exhaustion and depersonalization had lower RMSE and MAE under PLS-SEM, whereas reduced personal accomplishment had lower error under the LM benchmark, so predictive power is medium rather than high. Q² from blindfolding was 0.625 (the omission distance was not recorded in the study files), which indicates predictive relevance in-sample but does not demonstrate out-of-sample performance.

Table 15. PLSpredict Assessment of Out-of-Sample Predictive Relevance

Dimension (lower-order component)	Q ² predict	PLS-SEM RMSE	LM RMSE	PLS-SEM MAE	LM MAE
Depersonalization	0.446	0.749	0.757	0.557	0.571
Emotional Exhaustion	0.319	0.830	0.840	0.612	0.651
Reduced Personal Accomplishment	0.581	0.652	0.514	0.480	0.361

Source: SmartPLS 4 PLSpredict output, processed data, 2026. All Q²predict values exceed zero (Shmueli et al., 2016, 2019).

The traditional goodness-of-fit (GoF) index is not reported: it cannot distinguish valid from misspecified PLS models (Henseler & Sarstedt, 2013), and the value in the source study (0.400) could not be reproduced from its stated inputs (the square root of 0.780×0.454 is 0.595). SRMR was not exported and is not reported.

4.5 Testing the Directional Moderation Hypothesis (H3)

H3 predicts a negative AQ $\times$ WFC interaction. In SmartPLS the interaction was positive ($\beta = 0.153$, $t = 1.952$, $p = .051$; Table 12), the opposite sign to that hypothesized, so H3 is not supported regardless of whether p falls just above or below .05. In the independent re-estimation (Table 13) the interaction was 0.154 (95% percentile CI [-0.045, 0.277]; BCa [-0.021, 0.304]; bootstrap $p = .064$). The interval includes zero, so the data neither support buffering nor establish a reverse (amplifying) interaction. In the two-stage typology (Table 16), AQ was a significant direct predictor in Stage 1 ($\beta = -0.358$, $t = 4.631$) and the interaction was not significant in Stage 2, which under Sharma et al. (1981) classifies AQ as an antecedent (predictor) variable rather than a moderator. We treat this as a descriptive classification, not as proof that moderation is absent.

Table 16. Two-Stage Moderation-Typology Test

Stage	Path	β	t-value	p-value
Stage 1	WFC $\rightarrow$ Job Burnout	0.505	7.312	0.000
Stage 1	AQ $\rightarrow$ Job Burnout	-0.358	4.631	0.000
Stage 2	WFC $\rightarrow$ Job Burnout	0.485	7.115	0.000
Stage 2	AQ $\rightarrow$ Job Burnout	-0.355	4.621	0.000
Stage 2	AQ $\times$ WFC $\rightarrow$ Job Burnout	0.153	1.952	0.051

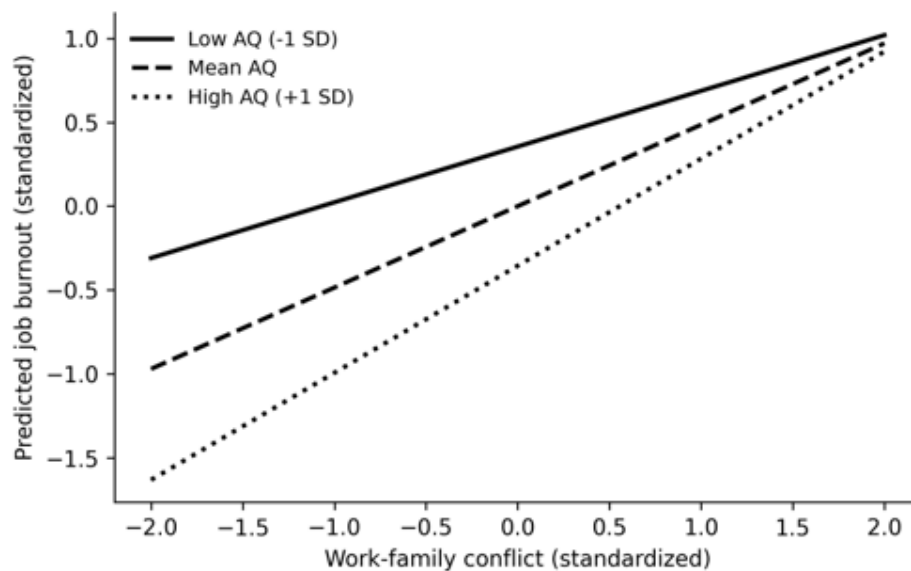
Source: SmartPLS 4 output, processed data, 2026. Typology per Sharma, Durand, and Gur-Arie (1981). Table 17 gives the WFC $\rightarrow$ burnout slope at low (-1 SD), mean, and high (+1 SD) AQ. The slope was positive at all three levels, and its percentile interval excluded zero each time. It was numerically larger, not smaller, at high AQ (0.332 to 0.638 from the SmartPLS coefficients; 0.320 to 0.628 in the re-estimation), the reverse of buffering. The intervals for the slopes at low and high AQ overlap widely, so the difference between them is itself uncertain.

Table 17. Conditional Slope of WFC on Job Burnout at Levels of AQ

Level of AQ	Slope (SmartPLS coefficients)	Slope (re-estimation)	95% percentile CI	95% BCa CI
Low (-1 SD)	0.332	0.320	[0.153, 0.598]	[0.105, 0.545]
Mean	0.485	0.474	[0.353, 0.619]	[0.319, 0.591]
High (+1 SD)	0.638	0.628	[0.439, 0.842]	[0.457, 0.861]

Source: Slope = $\beta(\text{WFC}) + \beta(\text{interaction}) \times \text{AQ level in standardized units}$; SmartPLS-based values computed from Table 12, other columns from the independent re-estimation, 2026.

Figure 2 plots the model-implied lines. The three lines converge at high WFC: AQ is associated with lower burnout mainly when WFC is low, and its association becomes negligible when WFC is high. This is the reverse of buffering, in which AQ's advantage should be greatest under high WFC. Given the instability of the interaction (Section 4.5.2), this pattern should not be interpreted as an amplification effect.

Figure 2. Model-Implied Simple Slopes of WFC on Job Burnout at Low, Mean, and High AQ

Source: Computed from the SmartPLS coefficients in Table 12 (standardized units), 2026.

4.5.1 Common Method Bias Assessment

All constructs were self-reported by the same respondents at one time point, so common method bias (CMB) was assessed with two diagnostics computed from the raw data. In Harman's single-factor test, an unrotated principal-component analysis of the 50 items yielded 12 components with eigenvalues above 1, the first explaining 33.8% of the variance; for the 38 retained items, the first component explained 43.7% (8 eigenvalues above 1). Neither exceeds 50%, but 43.7% is not negligible, and Harman's test is a weak diagnostic. The full-collinearity VIFs of the three constructs (Kock, 2015) were 2.58 (WFC), 2.28 (AQ), and 2.70 (burnout), below the 3.3 threshold, which gives no indication of pathological CMB at the construct level. At the dimension level, work-interfering-with-family (5.28), reduced personal accomplishment (4.20), depersonalization (4.11), reach (3.68), and emotional exhaustion (3.28) were at or above

3.3, reflecting strong overlap among related dimensions. These diagnostics cannot rule out shared response tendencies or social desirability (Podsakoff et al., 2003): low WFC and burnout with high AQ is the pattern that socially desirable self-presentation would produce, and no procedural remedy such as temporal separation or an independently sourced outcome was used.

4.5.2 Statistical Power, Restricted Range, and Influential Records

The sample-size heuristic in Section 3.1 concerns the main paths. For the single interaction term (three predictors, $n = 155$, $\alpha = .05$), a sensitivity analysis based on the noncentral F distribution indicates 80% power only for $f^2 \geq 0.051$; power was 0.42 for a conventional small effect ($f^2 = 0.02$), 0.64 for $f^2 = 0.035$, and 0.22 for $f^2 = 0.009$. Interaction effects in applied research are typically much smaller than main effects: a 30-year review of moderated regression with categorical moderators reported a median f^2 of 0.002 (Aguinis et al., 2005). The study was therefore underpowered for small, realistic interactions, and the restricted ranges in Table 4 reduce power further. This is an OLS-based approximation to the PLS-SEM test, and observed power was not computed because it is a function of the p-value.

The interaction coefficient was also unstable. The product term was strongly skewed (-2.61) and heavy-tailed (excess kurtosis 8.90). An ordinary least-squares test on the latent scores gives $t = 4.19$ for the interaction, but a heteroskedasticity-robust (HC3) test gives $t = 1.86$, matching the bootstrap, and removing the three most influential records (by Cook's distance) reduces the coefficient from 0.154 to -0.006 ($t = -0.12$). Two of these records (rows 2 and 113 of the data file) closely resemble each other (Section 4.5.3). The positive interaction in the primary analysis thus rests on very few observations.

4.5.3 Data Screening and Robustness Checks

Screening of the raw item file identified 44 records (rows 112–155) whose responses closely mirror those of records 1–44 at a constant offset of 111 rows: the paired records agreed on 82.7% of the 50 item responses on average (versus 42.9% for arbitrary pairs of records), and 40 of the 44 pairs agreed on at least 80% of items. The authors compared the data file with the original paper questionnaires and found the entries to match, so the resemblance reflects the responses as recorded; we could not establish its reason, and it may indicate that these responses are not fully independent. The data file holds no questionnaire identifiers, collection dates, nursing-unit information, or administration batches, so provenance and independence cannot be documented from it, and the full-sample results are therefore treated as provisional (Section 4.5.5). These records were retained in the primary analysis, as in the source study, and results without them are reported below.

Table 18 shows that the interaction was positive or near zero, with a 95% interval that included zero, in every specification: with all 50 items retained (0.145), without the 44 mirrored records ($n = 111$; 0.123), for each burnout dimension separately (exhaustion 0.199, depersonalization 0.173, reduced personal accomplishment 0.050), and with the two WFC directions entered separately (WIF $\times$ AQ -0.014; FIW $\times$ AQ 0.153). The absence of evidence for buffering is therefore consistent across these specifications, although they use the same data and cannot address the data-quality concerns above. Main effects differed across dimensions: with the two WFC directions entered separately, work-interfering-with-family was associated with burnout

($\beta = 0.54$, 95% CI [0.39, 0.68]) whereas family-interfering-with-work was not ($\beta = -0.03$, 95% CI [-0.17, 0.11]); and AQ was associated with emotional exhaustion ($\beta = -0.43$) and depersonalization ($\beta = -0.50$) but not with reduced personal accomplishment ($\beta = -0.07$, 95% CI [-0.20, 0.07]), which was in turn the dimension most strongly associated with WFC ($\beta = 0.76$).

Table 18. Robustness of the AQ $\times$ WFC Interaction Across Specifications

Specification	n	Interaction β	95% percentile CI
Primary (SmartPLS 4)	155	0.153	Not exported
Independent re-estimation, 38 retained items	155	0.154	[-0.045, 0.277]
All 50 items retained	155	0.145	[-0.050, 0.267]
Excluding the 44 records that mirror earlier records	111	0.123	[-0.059, 0.259]
Excluding the 3 most influential records (OLS on latent scores)	152	-0.006	t = -0.12
Outcome: emotional exhaustion	155	0.199	[-0.065, 0.337]
Outcome: depersonalization	155	0.173	[-0.030, 0.296]
Outcome: reduced personal accomplishment	155	0.050	[-0.045, 0.136]
WIF $\times$ AQ (WIF and FIW entered separately)	155	-0.014	[-0.153, 0.201]
FIW $\times$ AQ (WIF and FIW entered separately)	155	0.153	[-0.035, 0.278]

Source: Independent re-estimation on the raw item data (2,000 bootstrap resamples per specification, percentile intervals), 2026. WIF = work interfering with family; FIW = family interfering with work.

4.5.4 Alternative Specification: Correlated First-Order Dimensions

Because the second-order structure is a modeling choice and WIF and FIW behaved differently, the structural model was re-estimated with WIF, FIW, and AQ as separate predictors and each burnout dimension as a separate outcome, with WIF $\times$ AQ and FIW $\times$ AQ interactions (independent re-estimation; Table 19). WIF was positively associated with all three burnout dimensions (exhaustion 0.27, depersonalization 0.20, reduced personal accomplishment 0.84), whereas FIW was not associated with any of them (all intervals include zero). AQ was negatively associated with exhaustion (-0.45) and depersonalization (-0.51) but not with reduced personal accomplishment (-0.08; interval includes zero). None of the six interaction coefficients had an interval that excluded zero; the FIW $\times$ AQ coefficients for exhaustion (0.21) and depersonalization (0.22) were again positive, opposite to buffering.

Table 19. Correlated First-Order Model: Standardized Coefficients [95% Percentile CI]

Predictor	Emotional exhaustion	Depersonalization	Reduced personal accomplishment
WIF	0.27 [0.08, 0.47]	0.20 [0.01, 0.40]	0.84 [0.73, 0.95]
FIW	-0.07 [-0.26, 0.12]	0.04 [-0.12, 0.21]	-0.05 [-0.16, 0.06]
AQ	-0.45 [-0.61, -0.26]	-0.51 [-0.69, -0.34]	-0.08 [-0.20, 0.05]
WIF × AQ	-0.02 [-0.23, 0.26]	-0.04 [-0.24, 0.19]	0.02 [-0.11, 0.22]
FIW × AQ	0.21 [-0.04, 0.40]	0.22 [-0.01, 0.40]	-0.00 [-0.18, 0.12]
R ²	0.43	0.53	0.75

Source: Independent re-estimation on the raw item data (2,000 bootstrap resamples), 2026. WIF = work interfering with family; FIW = family interfering with work; AQ = second-order adversity quotient score.

The first-order model explained more variance than the second-order (hierarchical) model for reduced personal accomplishment ($R^2 = 0.75$ vs. 0.66; ten-fold cross-validated RMSE 0.52 vs. 0.60) and about as much for exhaustion and depersonalization (Table 20). The two specifications agree that AQ shows no buffering, but they differ on H1 and H2: the aggregate WFC–burnout association is carried by WIF and, above all, by reduced personal accomplishment, the dimension with the weakest measurement and the strongest overlap with WFC (Section 4.3), and AQ’s association is confined to exhaustion and depersonalization. The aggregate second-order estimates for H1 and H2 should therefore be read as summaries of heterogeneous dimension-level associations rather than as evidence about unitary WFC and burnout constructs. We retain the second-order model as the summary hypothesis-testing model because it is the model specified by the study design and because the conclusion on H3 does not depend on the choice, but the dimension-level results are equally important for interpretation.

Table 20. Second-Order vs. Correlated First-Order Predictors of Each Burnout Dimension

Outcome	R ² (second-order predictors)	R ² (first-order predictors)	CV-RMSE (second-order)	CV-RMSE (first-order)
Emotional exhaustion	0.41	0.43	0.812	0.811
Depersonalization	0.52	0.53	0.728	0.732
Reduced personal accomplishment	0.66	0.75	0.596	0.519

Source: Independent re-estimation, 2026. Second-order predictors: WFC, AQ, WFC × AQ. First-order predictors: WIF, FIW, AQ, WIF × AQ, FIW × AQ. CV-RMSE = ten-fold cross-validated root mean square error, averaged over 30 random fold assignments (latent scores computed once on the full sample).

4.5.5 Full-Sample Results Are Provisional

Because the independence of the 44 mirrored records could not be demonstrated, and the data file holds no identifiers, dates, nursing units, or batch information to document provenance, the full-sample ($n = 155$) results are provisional. No clearly verified subsample exists: it cannot be determined which record of each mirrored pair, if either, is an original response, so excluding rows 112–155 is a sensitivity analysis rather than a verified specification. Table 21 compares the full-sample results with those excluding the 44 mirrored records ($n = 111$). The pattern is the same: WFC and AQ remain associated with burnout in the expected directions, and the interaction is positive with an interval that includes zero.

Table 21. Full Sample ($n = 155$) vs. Excluding the 44 Mirrored Records ($n = 111$)

Parameter	SmartPLS, $n = 155$	Re-estimation, $n = 155$	Re-estimation, $n = 111$
WFC $\rightarrow$ Job Burnout	0.485	0.474 [0.353, 0.619]	0.439 [0.300, 0.600]
AQ $\rightarrow$ Job Burnout	-0.355	-0.365 [-0.511, -0.203]	-0.401 [-0.574, -0.229]
AQ $\times$ WFC $\rightarrow$ Job Burnout	0.153	0.154 [-0.045, 0.277]	0.123 [-0.059, 0.259]
R ² (Job Burnout)	0.674	0.668 [0.612, 0.754]	0.651 [0.586, 0.753]
f ² (AQ $\times$ WFC)	0.116	0.116 [0.000, 0.481]	0.067 [0.000, 0.412]

Source: SmartPLS 4 output (first column) and independent re-estimation with 95% percentile intervals (2026). The $n = 111$ analysis retains the same 38 items and was bootstrapped with 2,000 resamples.

4.6 Discussion: Work–Family Conflict and Burnout (H1)

WFC was positively associated with burnout, consistent with nursing studies from China and Iran that report WFC–burnout associations (Diao et al., 2024; Yarifard et al., 2023); related work–family strain outcomes have been reported in Malaysia and Korea (Dousin et al., 2022; Hwang & Yu, 2021). This study adds evidence from a regional Indonesian hospital. The association is compatible with the COR account in which incompatible work and family demands consume finite time and energy. However, the design is cross-sectional and self-reported, so the association cannot be read as causal: nurses who are already exhausted may perceive and report more work–family interference, and shared perceptions or response tendencies, including social desirability in a single-employer survey on sensitive topics, may inflate the associations among WFC, AQ, and burnout (Podsakoff et al., 2003). The two WFC directions also behaved differently: in the first-order model (Section 4.5.4), work-interfering-with-family was associated with all three burnout dimensions, most strongly reduced personal accomplishment ($\beta = 0.84$), whereas family-interfering-with-work was associated with none, so the aggregate WFC–burnout association ($\beta = 0.49$) should be read as largely a WIF association. The high HTMT between WFC and burnout (0.86) and the cross-loading of reduced personal accomplishment on WFC (0.81) suggest that this dimension overlaps empirically with WFC, so part of the association may reflect construct overlap rather than a link between distinct constructs.

4.7 Discussion: Adversity Quotient and Burnout (H2)

AQ was negatively associated with burnout, in line with nursing studies linking AQ to lower work stress (Luo et al., 2025) and with a review of AQ among healthcare professionals (Saxena & Rathore, 2025). Within COR theory this is compatible with AQ acting as a personal resource, but reverse or reciprocal explanations are equally plausible: nurses with less burnout may describe themselves in more AQ-consistent terms. AQ was high and range-restricted in this sample (72.9% scored 4 or higher) and was self-rated by the same respondents who rated burnout, so the strength of the association may partly reflect shared response tendencies. In the first-order model (Section 4.5.4), the association was confined to emotional exhaustion and depersonalization and was absent for reduced personal accomplishment.

4.8 Discussion: No Evidence of Buffering (H3)

H3 predicted a negative AQ $\times$ WFC interaction, but the estimated interaction was positive ($\beta = 0.153$; re-estimation 0.154, 95% percentile CI [-0.045, 0.277]). A positive coefficient implies a steeper, not flatter, WFC–burnout association at higher AQ, so the buffering hypothesis is not supported irrespective of statistical significance. The interaction itself was not statistically distinguishable from zero ($p = .051$ in SmartPLS; .064 in the re-estimation), and the interval for its f^2 ran from 0.00 to 0.48. Three considerations argue against reading the positive estimate as evidence of a reverse moderation effect. First, it depended on a handful of records: the product term was strongly skewed and heavy-tailed, the robust t was 1.86, and removing the three most influential records reduced the coefficient to -0.006 (Section 4.5.2). Second, it was not robust across specifications (Table 18). Third, restricted score ranges and limited power (adequate only for $f^2 \geq 0.05$) mean that small interactions of either sign could neither be detected nor excluded. The appropriate conclusion is that this study found no evidence that AQ buffers the WFC–burnout association and cannot determine whether any interaction, positive or negative, exists. This is consistent with recent cautions that personal resources need not buffer every stressor (Liao et al., 2022; Sonnentag & Meier, 2024). Absence of evidence is not evidence of absence: with power adequate only for $f^2 \geq 0.05$, narrow score ranges, and provisional full-sample data (Section 4.5.5), these results do not show that AQ cannot buffer the WFC–burnout association; they show that this dataset provides no reliable support for it.

4.9 Theoretical and Managerial Contributions

Theoretically, the study provides a transparent, directional test of a COR-based buffering proposition for AQ. Its strongest defensible contribution is that WFC and AQ show direct, dimension-specific associations with burnout, while this dataset does not provide reliable support for AQ buffering; the data do not permit a definitive rejection of the buffering proposition. It also illustrates that a positive, non-significant interaction should be reported with its sign, interval, power, and influence diagnostics, since it contradicts a buffering hypothesis irrespective of its p -value. Finally, it extends the AQ literature, which has often involved students and trainees (Gou et al., 2024; Liu & Wang, 2023; Suksatan et al., 2021), to practicing female nurses, using a newly developed instrument that should be validated before the constructs are treated as established.

Because the findings are cross-sectional associations from a single hospital and the data have the limitations described in Section 6, they are best treated as hypotheses for hospital managers

rather than as evidence for specific interventions. If replicated, they would suggest that reducing structural sources of work–family conflict (for example predictable scheduling, flexible emergency leave, and childcare support) and strengthening nurses’ adversity-response skills (for example structured debriefing and peer support) are separate levers rather than substitutes, since AQ showed no evidence of weakening the WFC–burnout association. Any such program should be piloted and evaluated with its own outcome data using validated instruments.

5. Conclusion and Suggestion

Among 155 female nurses with an active work–family role at a regional Indonesian hospital, work–family conflict was positively and adversity quotient negatively associated with job burnout in a two-stage PLS-SEM model ($R^2 = 0.674$). These full-sample results are provisional, because 44 records closely mirror earlier records and independence could not be demonstrated, and because they rest on a newly developed, empirically purified instrument. At the dimension level, the WFC association was carried by work-interfering-with-family, above all for reduced personal accomplishment, and AQ’s association was limited to exhaustion and depersonalization. The hypothesis that AQ negatively moderates the WFC–burnout association was not supported: the interaction was positive and its interval included zero. Because power was limited, this is an absence of evidence for buffering, not evidence that buffering is absent.

The findings are associational and should be interpreted cautiously given the cross-sectional self-report design, the newly developed instrument from which 12 of 50 items were removed, narrow score ranges, limited power for interactions, and the unresolved provenance of 44 records. Future studies should replicate the model with established validated WFC and burnout scales and a validated AQ measure, in larger multi-site samples with documented respondent provenance, independent or time-separated outcome measures, and formal ethical clearance.

6. Limitations and Future Research

Several limitations apply. (1) Design: the survey is cross-sectional and single-source self-report, so causal direction and shared-method or social-desirability effects cannot be separated (Podsakoff et al., 2003); common method bias was assessed only with Harman’s test and full-collinearity VIFs. (2) Instrument: items were developed by the research team and are not validated scales, and no expert content-validity review or pilot test is documented. Twelve of 50 items were removed through data-driven deletion, almost all of them the last item of a block, for reasons we could not establish, and reduced personal accomplishment retained only three items. All measurement statistics describe this empirically purified, newly developed instrument and do not validate the original 50 items, so the structural findings are not definitive evidence about the theoretical constructs. (3) Higher-order structure: the HTMT between WFC and burnout (0.866; BCa upper limit 0.96) exceeds 0.85, and reduced personal accomplishment cross-loads 0.814 on WFC against 0.828 on burnout. A correlated first-order model fits as well or better and shows heterogeneous dimension-level associations (Section 4.5.4), so the aggregate H1 and H2 estimates summarize heterogeneous associations. (4) Power

and range: power was adequate only for interactions with $f^2 \geq 0.05$, and score ranges were narrow, so small interactions could not be detected or excluded. (5) Provenance and independence: 44 records (rows 112–155) closely mirrored records 1–44 (mean agreement 82.7% of item responses at a constant offset of 111 rows, versus 42.9% for arbitrary pairs). The authors compared the data file with the original paper questionnaires and found the entries to match, but the data file contains no questionnaire identifiers, collection dates, nursing units, or administration batches, independence could not be demonstrated, and no verified subsample exists; the full-sample results are therefore provisional. (6) Sampling: purposive sampling at one hospital; the target-population headcount, the number of questionnaires distributed, and the response rate were not recorded, and the one-year tenure guideline was not applied uniformly (13 respondents with less than one year of tenure). (7) Reporting: SRMR, the blindfolding omission distance, and the SmartPLS bootstrap settings were not recorded in the study files, and exact SmartPLS bootstrap intervals were not exported and are replaced here by an independent re-estimation. (8) Ethics: only a research permission letter from the Kendari City National Unity and Politics Agency (No. 000.9.2/73/2026) exists; formal ethical-review approval was not obtained or documented, and the informed-consent and anonymity procedures are not documented. Future work should address these points with validated instruments, larger multi-site samples with documented respondent provenance, objective or time-separated outcome measures, and formal ethical clearance obtained before data collection.

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Declaration of AI and AI-assisted technologies in the writing process

During the preparation of this manuscript, the authors used Claude (Anthropic), an AI language assistant, for literature identification, language editing, statistical re-analysis and checks, and revision of the manuscript in response to peer review. The authors reviewed and edited all content and take full responsibility for the content of the publication.

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