



Contents lists available at [Journal ELORA](#)

JRTI (Jurnal Riset Tindakan Indonesia)

ISSN: 2502-079X (Print) ISSN: 2503-1619 (Electronic)

Journal homepage: <https://jrti.eloracenter.org/jrti>



Exercise motivation mediates individual and work determinants of sport participation among Indonesian civil servants: a path analysis

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Article Info

Article history:

Received Jun 19th, 2026
Revised Jul 26th, 2026
Accepted Jul 27th, 2026

Keywords:

Sport participation
Exercise motivation
Civil servants
Workplace health promotion
Path analysis

ABSTRACT

Physical inactivity is a major modifiable risk factor for non-communicable diseases, while evidence explaining how individual and workplace factors relate to sport participation among public-sector employees in low- and middle-income countries remains limited. This study examined the associations between individual factors, work factors, exercise motivation, and sport participation among Indonesian civil servants using a cross-sectional survey. A total of 426 eligible civil servants with at least one year of service voluntarily participated through purposive sampling, providing a sample adequate for the proposed path analysis. Four validated Likert-scale instruments (53 retained items; Cronbach's $\alpha = .651-.902$) measured the study constructs. Path analysis based on ordinary least squares regression was performed after all statistical assumptions were satisfied. Exercise motivation showed the strongest direct association with sport participation ($\beta = .522, p < .001$), followed by individual factors ($\beta = .251, p < .001$) and work factors ($\beta = .089, p = .010$). Individual factors demonstrated a stronger indirect association with sport participation through exercise motivation (.313) than their direct association (.251), whereas work factors showed a relatively small indirect association (.063). Together, the predictors explained 54.9% of the variance in sport participation ($R^2 = .549$). Because the study employed a cross-sectional design, the identified pathways should be interpreted as statistical associations rather than causal relationships. The findings highlight exercise motivation as the strongest correlate of sport participation and suggest that workplace health promotion should prioritize motivational strategies alongside supportive organizational environments.



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Introduction

Physical inactivity has become a major public health problem in the 21st century. It's one of the most serious and hardest to solve. A recent pooled analysis covering 507 surveys and 5.7 million people found that 31.3% of adults worldwide didn't meet activity recommendations in 2022, up from 26.4% in 2010. The study also projected we'll miss the global goal of a 15% reduction by 2030 Strain et al., 2024, (2024), in a meta-analysis of randomized workplace intervention studies involving office workers. The WHO recommends adults get 150 to 300 minutes of moderate or 75 to 150 minutes of vigorous aerobic activity each week, plus strength training at least twice a week. In 2020, they added a new recommendation: limit sedentary time (Bull et al., 2020). The

economic cost is steep. In 2013, inactivity cost health systems INT\$53.8 billion and led to \$13.7 billion in productivity losses (Ding et al., 2016). Without changes, it's expected to cause 499.2 million preventable non-communicable disease cases and INT\$520 billion in direct health costs between 2020 and 2030 (Costa Santos et al., 2023). These numbers show that inactivity is more than a lifestyle choice. It's a financial and development risk, especially for middle-income countries where disease burden is high but prevention capacity is low.

In the big picture, the workplace holds a key position. Adults are at work for many of their waking hours, so their jobs determine both their chances and their leftover energy to be active. Sitting at a desk has been linked to heart problems since the 1950s. Today's evidence still marks desk workers as a high-risk group. Some systematic evidence shows that workplace programs with multiple elements can cut occupational sitting (Zhou et al., 2023). Combined strategies can reduce workplace sitting by about 38 minutes each day Wang et al. (2024), in a meta-analysis of randomized workplace intervention studies involving office workers. Digital tools can produce similar cuts for desk workers (Parés-Salomón et al., 2024). However, nearly all this evidence comes from high-income countries and white-collar workers in wealthy organizations. So it's not safe to assume it will transfer to public bureaucracies in the Global South.

Indonesia is a clear example of the gap. The 2023 Indonesian Health Survey reported that 37.4% of those aged 10 and older didn't get enough physical activity. Lack of time was the main reason, given by 48.7% of respondents. Low motivation came next. A scoping review of Indonesian studies on physical activity found they mostly use cross-sectional methods and self-reports, focus on youth, and rarely test interventions or theory (Andriyani et al., 2020). The country has no standalone national action plan for physical activity. Instead, promotion is spread across health and sport regulations. In this setting, civil servants (Aparatur Sipil Negara) are a strategically important group. They are large in number, easy to reach through administrative channels, subject to health mandates, and exposed to the sedentary routines that discourage movement. They also carry symbolic weight. As the public face of local government, their own activity levels influence the credibility of the sport programs they are supposed to deliver.

Three theoretical frameworks structure this problem. Self-determination theory draws a line between autonomous and controlled regulation. It predicts that internal, self-endorsed motives will keep someone exercising, while external motives won't (Ryan & Deci, 2000; Ryan & Deci, 2020). A review confirms a clear positive link between autonomous motivation and exercise. Intrinsic regulation is especially good at predicting long-term adherence (Teixeira et al., 2012). Programs based on self-determination theory lead to small to medium gains in motivation and health behavior (Ntoumanis et al., 2021). Social cognitive theory places behavior at the center of personal, behavioral, and environmental influences. It identifies self-efficacy and goal-setting as the most consistent predictors of activity (Young et al., 2014). The job demands-resources model handles the occupational side. It proposes a health-impairment process where chronic demands wear down energy, and a motivational process where resources fuel goal pursuit (Bakker et al., 2023). When applied to leisure-time activity, the model implies that high job demands should suppress participation indirectly, through fatigue and loss of motivation, rather than through a direct time constraint. But empirical tests have supported this prediction only weakly and inconsistently.

This inconsistency defines the knowledge gap. Research on employees shows reciprocal relationships between activity and work-related fatigue (de Vries et al., 2016) and indicates that occupational stress predicts activity indirectly via controlled motivation rather than a direct path (Deng et al., 2024). However, the samples have been small, Western, and mostly from education or service jobs. Whether work characteristics affect sport participation mainly through motivation, and whether that effect holds after controlling for individual factors, is not settled. A practical gap also exists. Indonesian local governments regularly invest in sport facilities and ceremonial events, assuming that providing opportunities will drive participation. But there is no evidence on whether opportunity or motivation is the real bottleneck. This leads to a theoretical gap. Self-determination theory and the job demands-resources model are seldom combined in a single analysis. So the relative weight of psychological versus structural determinants is rarely measured in a way that can guide resource allocation.

The present study addresses these gaps by estimating a mediated model of sport participation in a large sample of Indonesian local government employees. Its novelty is threefold. First, it provides the first path-analytic breakdown of direct and indirect determinants of sport participation in an Indonesian public-sector workforce. This group is missing from the international literature. Second, it combines individual, occupational, and motivational determinants in a single estimated structure. That lets us directly compare their magnitudes instead of the separate bivariate approaches that are standard. Third, it tests the mediation proposition of the job demands-resources model in a low-autonomy bureaucratic environment, which is quite different from the high-control Western workplaces where the model was developed.

Six hypotheses were derived. Individual factors were expected to have a positive direct effect on sport participation (H1). The reasoning is that health status, fitness, and prior exercise experience influence both capability and behavioural readiness. Work factors were expected to have a positive direct effect (H2), since supportive schedules, facilities, and institutional programmes expand opportunity. Exercise motivation was expected to have a positive direct effect (H3), consistent with self-determination theory. Individual factors (H4) and work factors (H5) were each expected to have positive indirect effects on participation through motivation. This reflects the motivational process of the job demands-resources model and the internalisation mechanism of self-determination theory. Finally, the three predictors together were expected to explain a significant proportion of variance (H6). The study therefore aimed to quantify the direct effects of individual factors, work factors, and exercise motivation on sport participation. It also aimed to estimate the indirect effects of individual and work factors through motivation. And it aimed to determine the combined explanatory power of the model.

Therefore, this study aims (1) to measure the effects of individual factors, work factors, and exercise motivation on sport participation; (2) to examine the indirect association of individual and work factors through exercise motivation using path analysis; and (3) to determine the explanatory power of the proposed model among Indonesian civil servants.

Method

Setting and Participants

The study took place among employees of the Ogan Komering Ulu Timur Regency Government in South Sumatra, Indonesia. The target population included all 13, 239 active civil servants spread across 54 regional government organizations, which covers the regional secretariat, technical agencies, sub-district offices, and two public hospitals. Data were collected in 2026.

We recruited participants using purposive sampling. They had to meet four criteria: (a) active status as a civil servant or government employee within the Regency Government; (b) at least one year of service, so they were familiar with the workload and work environment of their unit; (c) voluntary consent to participate; and (d) complete responses to all questionnaire items. We went with purposive sampling instead of probability sampling because the investigators couldn't get a randomizable sampling frame or directly distribute materials to individually selected employees. So the questionnaire was sent to all regional government organizations, giving every eligible employee a chance to take part.

Research Design

We used a cross-sectional quantitative survey design and analyzed the data with path analysis. Why path analysis over simple multiple regression? Because the research question was about breaking down total effects into direct and mediated parts, not just predicting an outcome. And we chose it over latent-variable structural equation modeling since all constructs were operationalized as observed composite scores. This design lets us estimate the hypothesized causal ordering, but it can't establish temporal precedence. We address that limitation in the Limitations section. The conceptual framework and the hypothesised research model that guided the analysis are presented in Figures 1 and 2.

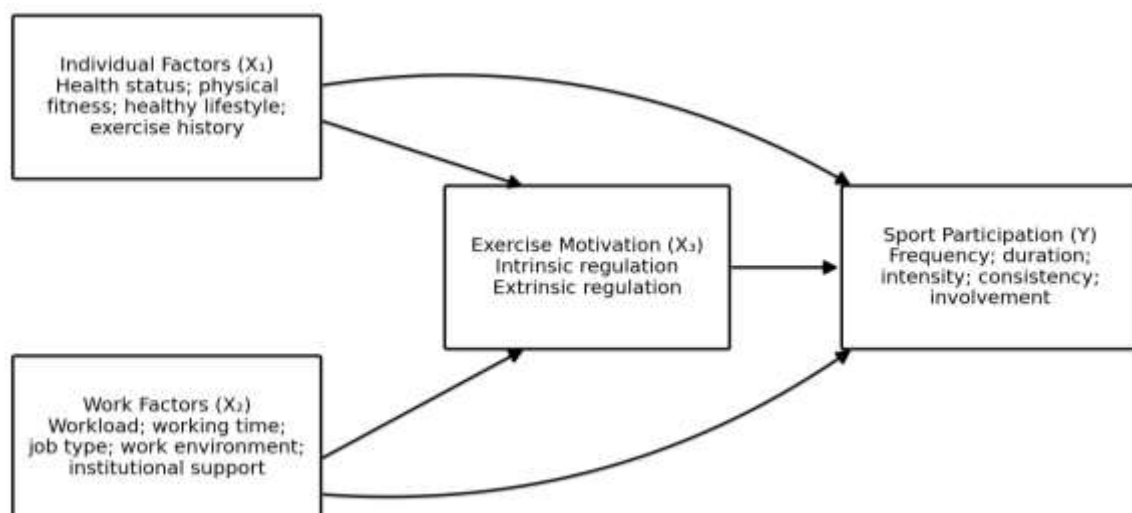


Figure 1 <Conceptual Framework of the Study>

Note. Solid arrows denote hypothesised causal paths. Individual and work factors are specified as exogenous variables, exercise motivation as the mediating variable, and sport participation as the endogenous outcome.

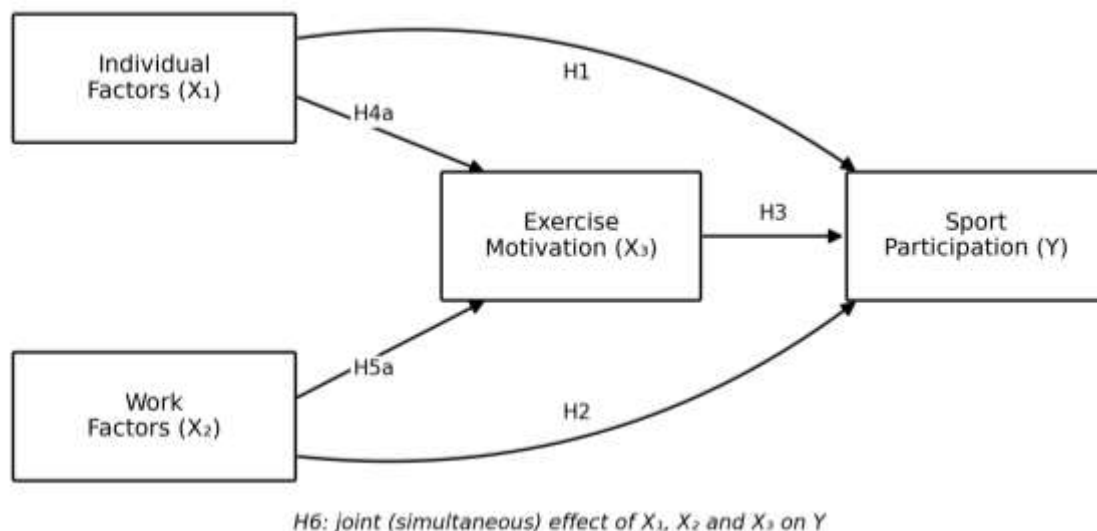


Figure 2 <Research Model and Hypothesised Paths>

Note. H1–H3 denote direct effects; H4a and H5a denote the antecedent paths of the mediated effects H4 and H5; H6 denotes the joint effect of all three predictors.

Sample Size Justification

We calculated the minimum sample size using Slovin's formula at a 5% margin of error: $n = 13,239 / (1 + 13,239 \times 0.0025) = 388.26$, meaning we needed at least 388 respondents. A post-hoc statistical power analysis indicated that the final sample of 426 respondents provided statistical power exceeding 0.80 for detecting small-to-medium indirect effects in the proposed mediation model. We aimed for about 400 to account for incomplete returns. The final sample hit 426, which is well above the minimum. It also easily meets conventional requirements for path analysis, with more than 80 cases per estimated structural parameter.

Because purposive sampling may introduce selection bias, demographic characteristics of the respondents were compared with official civil servant statistics of the Regency Government. The distributions of sex, educational attainment, employment category, and years of service were broadly comparable, suggesting acceptable representativeness of the obtained sample.

Variables and Measures

We measured four constructs, each with a purpose-built Likert questionnaire scored from 1 (strongly disagree) to 5 (strongly agree). Negatively worded items were reverse-scored before aggregation so that higher scores always point to a more favorable standing on the construct.

Individual factors (X_1) covered the internal attributes of employees that might shape exercise involvement. Four indicators were used: health status, physical fitness level, healthy lifestyle, and exercise experience and habit. Demographic attributes like age, sex, and family status were collected only for description and didn't go into the composite score.

Work factors (X_2) covered the occupational conditions that either help or hinder exercise involvement. Five indicators were used: workload, working time, job type (including the degree of sedentary work), work environment (leadership support, workplace exercise culture, colleague support), and institutional support for sport (office exercise programmes, opportunities to participate, supportive policy).

Exercise motivation (X_3) was based on self-determination theory, measuring the strength of the drive to exercise. The indicators included intrinsic regulation (maintaining health, improving fitness, personal enjoyment, awareness of the importance of exercise, post-exercise satisfaction) and extrinsic regulation (family support, colleague support, workplace encouragement, office exercise programmes, government-organised sport events).

Sport participation (Y) looked at the degree of regular and sustained exercise involvement, using five indicators: frequency, duration, intensity, consistency, and involvement in institutional or community sport activities. A supplementary open item asked respondents to list the sport disciplines they practiced most often; multiple answers were allowed.

Instrument Development, Content Validity and Reliability

Instrument development went through three stages. First, we wrote draft items based on the theoretical framework and past studies, then sent them for content validation by three expert reviewers: a linguist, who assessed clarity, sentence structure and readability; a psychologist, who looked at psychological construct coverage and whether items could capture behavior and motivation; and a sport scientist, who checked the substantive match between items, indicators and constructs. Items were revised based on reviewer feedback before pilot testing.

Second, the revised instrument was pilot tested with 31 respondents whose characteristics matched the target population, but they weren't employees of the Ogan Komering Ulu Timur Regency Government, so they were ineligible for the main sample.

Third, we checked item validity using corrected item, total correlations against a critical value of $r = .344$ ($df = 29$, $\alpha = .05$, two-tailed). Internal consistency was examined using Cronbach's alpha against a threshold of .60. Of the 66 items piloted, 53 passed the validity check and were kept: 12 of 16 for individual factors, 14 of 18 for work factors, 13 of 16 for exercise motivation, and 14 of 16 for sport participation. Alpha coefficients were .817 for individual factors, .902 for work factors, .651 for exercise motivation, and .883 for sport participation. Only the retained items were used in the main survey.

Data Collection

The questionnaire was administered online through Google Forms. Links were sent via official communication channels or through designated liaison officers within each regional government organization, which let the instrument reach employees spread across a geographically large regency. Before filling in the questionnaire, respondents were told about the study's purpose, that their responses would stay confidential, and that participation was voluntary. They gave consent electronically. Each respondent could submit only once. We also collected documentary data on institutional profiles, staffing establishments and sport activities for background context, but those weren't entered into the statistical analysis.

Ethical Considerations

The study followed the principles of the Declaration of Helsinki. Institutional permission was granted by the Ogan Komering Ulu Timur Regency Government through the Regional Secretariat and the Office of Youth, Sport and Tourism. All respondents gave informed consent electronically before taking part, were free to withdraw at any point, and were assured that their responses would stay anonymous and be used only for research. [Institutional ethics committee approval reference to be inserted.]

Data Preparation

Before analysis, we screened the returns for completeness, duplicate submissions, and eligibility against the inclusion criteria. We also inspected response quality for inconsistent answering, straight-lining, and extreme patterns. Cases whose patterns were logically defensible were kept so as not to harm the sample's representativeness. Negatively worded items were then reverse-scored, and composite scores were computed for each construct.

Statistical Analysis

All analyses were run in IBM SPSS Statistics. First, descriptive statistics (N, minimum, maximum, mean, standard deviation) described the distribution of each construct. Then we classified mean scores against norm-referenced intervals for the five-point scale.

Four assumption tests came before hypothesis testing. Normality of unstandardised residuals was examined using the one-sample Kolmogorov, Smirnov test. Linearity was checked with the ANOVA-based linearity and deviation-from-linearity tests. Homoscedasticity was examined with the Glejser test, where absolute residuals were regressed on each predictor. Multicollinearity was examined through tolerance and variance inflation factor (VIF) statistics, using the conventional criteria of tolerance $> .10$ and VIF < 10 .

Path analysis was then done by estimating two structural equations with ordinary least squares regression. The first equation regressed exercise motivation on individual factors and work factors. The second regressed sport participation on individual factors, work factors, and exercise motivation. Standardised regression coefficients (β) served as path coefficients. The proportion of variance in the outcome attributable to each path was computed as $\beta^2 \times 100\%$. Indirect effects were calculated as the product of constituent path coefficients ($\beta_{x \rightarrow m} \times \beta_{m \rightarrow y}$), and total effects as the sum of direct and indirect components. Mediation was inferred when the individual paths were significant. The joint contribution of the predictors was tested with the omnibus F test and quantified with R^2 and adjusted R^2 . The residual path coefficient was computed as $\sqrt{1 - R^2}$, and the model effect size as $f^2 = R^2 / (1 - R^2)$. Statistical significance was set at $\alpha = .05$.

Results and Discussions

Participant Characteristics

Table 1 breaks down the profile of all 426 respondents. The sample skewed toward mid-career workers. About 40% were between 35 and 44 years old, and another 29.11% were 45 or older. Employees under 25 made up only 2.82%. Men dominated the group at 62.21%. Women accounted for 37.79%, which was still enough to support meaningful comparisons across genders. Education levels were notably high. Over 61% held a bachelor's degree, and 11.50% had a postgraduate qualification. Tenure was another strong point. More than 70% had been with the organization for over ten years. That kind of experience usually signals deep familiarity with institutional routines and workplace culture. All three position types were represented. Administrative staff formed the largest share at 42.49%, followed by functional officers at 30.52% and structural officers at 26.99%.

Answers to the supplementary question about preferred disciplines (Figure 8) showed a strong tilt toward activities with low barriers and minimal equipment. Running got 239 votes. Group calisthenics collected 226. Put together, those two made up nearly half of all selections. Badminton came next with 122, followed by cycling at 82. Facility dependent or club based activities attracted very little interest. Table tennis and gym based training each got only one mention. Volleyball was named twice.

Table 1 <Characteristics of the Participants (N = 426)>

Characteristic	Category	n	%
Age	< 25 years	12	2.82
	25–34 years	119	27.93
	35–44 years	171	40.14
	≥ 45 years	124	29.11
Sex	Male	265	62.21
	Female	161	37.79
Educational attainment	Senior secondary	92	21.60
	Diploma (D3)	25	5.87
	Bachelor's (S1)	260	61.03
	Master's or doctoral (S2/S3)	49	11.50
Length of service	< 5 years	68	15.96
	5–10 years	59	13.85
	> 10 years	299	70.19
Position	Administrative staff	181	42.49
	Functional	130	30.52
	Structural	115	26.99

Note. Percentages are rounded to two decimal places and may not total exactly 100 because of rounding.

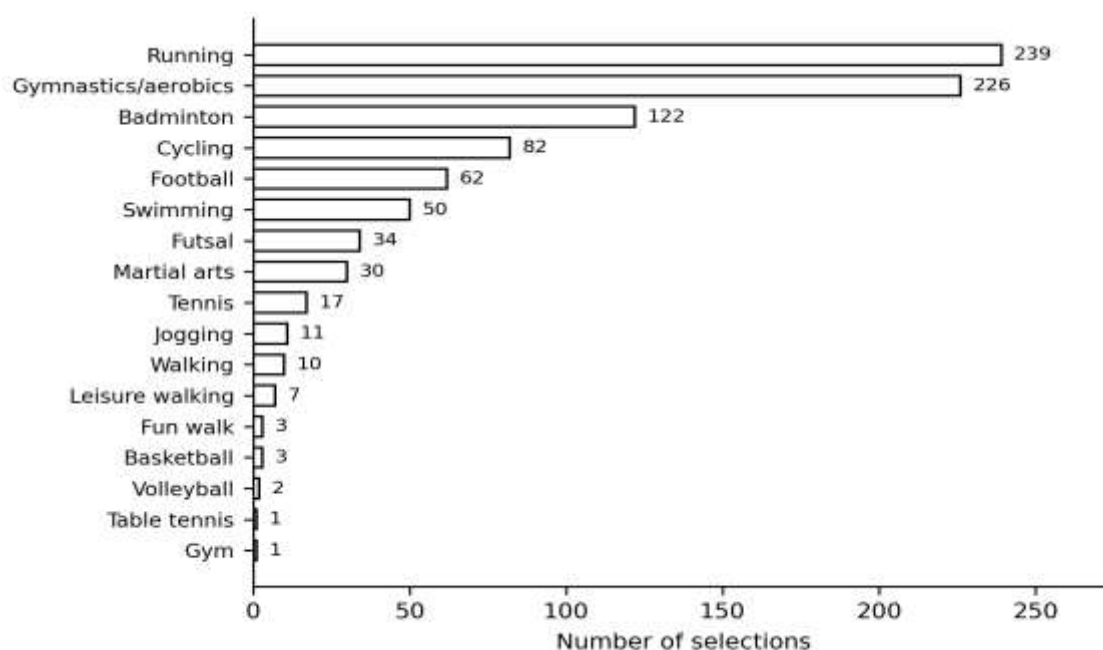


Figure 8 <Sport Disciplines Most Frequently Practised by Respondents>

Note. Respondents could nominate more than one discipline, so the total number of selections exceeds the number of respondents (N = 426).

Descriptive Statistics

Table 2 shows the distribution of the four constructs. Every variable spanned the full response range, and every mean fell within the moderate band. Exercise motivation had the highest mean ($M = 3.0376$, $SD = 0.98147$) and work factors the lowest ($M = 2.9601$, $SD = 0.92077$). Individual factors and sport participation were identical to four decimal places ($M = 2.9977$, $SD = 0.92418$ and 0.95671 respectively). Standard deviations clustered tightly between 0.92077 and 0.98147, pointing to fairly homogeneous views across a workforce spread over 54 organisational units.

Two things about this profile stand out. First, the ordering puts motivation above the structural conditions of work. That suggests these employees' psychological readiness surpasses the institutional context they have to act in. Second, all four means converge right at the scale midpoint. So the workforce isn't fully activated, nor is it completely inactive. Instead, it's sitting at a threshold: a configuration with plenty of room for intervention.

Table 2 <Descriptive Statistics for the Study Variables (N = 426)>

Variable	N	Min	Max	M	SD	Category
Individual factors (X_1)	426	1.00	5.00	2.9977	0.92418	Moderate
Work factors (X_2)	426	1.00	5.00	2.9601	0.92077	Moderate
Exercise motivation (X_3)	426	1.00	5.00	3.0376	0.98147	Moderate
Sport participation (Y)	426	1.00	5.00	2.9977	0.95671	Moderate

Note. All variables were measured on a five-point Likert metric. Categories were assigned using norm-referenced intervals for the five-point scale.

Instrument Validity and Reliability

The psychometric data from the pilot sample is in Table 3. Of the 66 piloted items, 53 went above the .344 critical correlation mark and were kept. The internal consistency turned out strong. Work factors scored an alpha of .902, sport participation .883, and individual factors .817. Exercise motivation was lower, at .651. That acceptable but modest number makes sense given the scale's design. It deliberately includes items tapping both intrinsic and extrinsic regulation. Self-determination theory treats those as separate constructs, not interchangeable ones. So some heterogeneity in how these items correlate is exactly what you'd expect, not a red flag. Even so, that coefficient was above our pre-specified cutoff, so we kept the scale. The Limitations section covers this point.

Table 3 <Item Validity and Internal Consistency of the Instruments (Pilot Sample, n = 31)>

Instrument	Items piloted	Items retained	Items discarded	Cronbach's α	Decision
Individual factors (X_1)	16	12	4	.817	Reliable
Work factors (X_2)	18	14	4	.902	Reliable
Exercise motivation (X_3)	16	13	3	.651	Reliable
Sport participation (Y)	16	14	2	.883	Reliable
Total	66	53	13	—	—

Note. Item validity was assessed with corrected item-total correlations against a critical value of $r = .344$ ($df = 29$, $\alpha = .05$, two-tailed). Alpha coefficients were evaluated against a threshold of .60.

Assumption Testing

Table 4 <Assumption Tests for the Path Model (N = 426)>

Assumption	Test	Statistic	p	Conclusion
Normality	One-sample Kolmogorov-Smirnov	KS = 0.043	.062	Residuals normally distributed
Linearity	ANOVA — linearity	F = 249.019	< .001	Linear relationship present
	ANOVA — deviation from linearity	F = 2.137	.095	No significant departure from linearity
Homoscedasticity	Glejser — X_1	t = 1.547	.123	Homoscedastic
	Glejser — X_2	t = -0.913	.362	Homoscedastic
	Glejser — X_3	t = -0.507	.613	Homoscedastic
Multicollinearity	Tolerance / VIF — X_1	0.589 / 1.698	—	No multicollinearity
	Tolerance / VIF — X_2	0.901 / 1.109	—	No multicollinearity
	Tolerance / VIF — X_3	0.586 / 1.707	—	No multicollinearity

Note. KS = Kolmogorov–Smirnov test statistic for the unstandardised residuals. The Glejser test regresses absolute residuals on each predictor. VIF = variance inflation factor. Criteria: $p > .05$ for normality, deviation from linearity and the Glejser test; tolerance $> .10$ and VIF < 10 for the absence of multicollinearity.

In Table 4, the four assumption tests are summarised. The residuals followed a normal distribution, with a KS statistic of 0.043 and a p-value of .062. The linearity test was significant ($F = 249.019$, $p < .001$), and the deviation from linearity was not ($F = 2.137$, $p = .095$). These results confirm that linear terms adequately represent the relationships. The Glejser test provided non-significant coefficients for all three predictors ($p = .123, .362$, and $.613$), pointing to homoscedastic errors. Tolerance values ranged from .586 to .901, while VIF values were between 1.109 and 1.707. Both are within conventional limits, so the standardised coefficients can be seen as stable partial effects. All conditions for ordinary least squares path estimation were therefore satisfied.

Direct Effects

The direct effects appear in Tables 5 and 6 and Figures 3 and 4. When predicting exercise motivation, individual factors emerged as the dominant antecedent ($\beta = .599$, $p < .001$). They account for 35.88% of the variance along that path. Work factors, meanwhile, gave a statistically significant but substantively tiny effect ($\beta = .121$, $p = .002$; 1.46%). That gap is nearly fivefold, and it stands as one of the study's central findings.

For sport participation, exercise motivation was the strongest predictor ($\beta = .522$, $p < .001$; 27.25%). Individual factors came next ($\beta = .251$, $p < .001$; 6.30%), and work factors last ($\beta = .089$, $p < .010$; 0.79%). Hypotheses H1, H2 and H3 were therefore supported, but the practical weight of the three effects differs by almost two orders of magnitude in variance terms.

Table 5 <Path Coefficients for the Structural Model (N = 426)>

Structural equation	Path	β	Contribution (%)	p	Decision
Equation 1: X_3 regressed on X_1, X_2	$X_1 \rightarrow X_3$	.599	35.88	< .001	Supported
	$X_2 \rightarrow X_3$	.121	1.46	.002	Supported
Equation 2: Y regressed on X_1, X_2, X_3	$X_1 \rightarrow Y$	.251	6.30	< .001	H1 supported
	$X_2 \rightarrow Y$	.089	0.79	< .010	H2 supported
	$X_3 \rightarrow Y$	.522	27.25	< .001	H3 supported

Note. β = standardised path coefficient. Contribution = $\beta^2 \times 100\%$, the percentage of variance in the endogenous variable attributable to that path. Unstandardised coefficients, standard errors and confidence intervals were not retained in the source analysis and are therefore not reported.

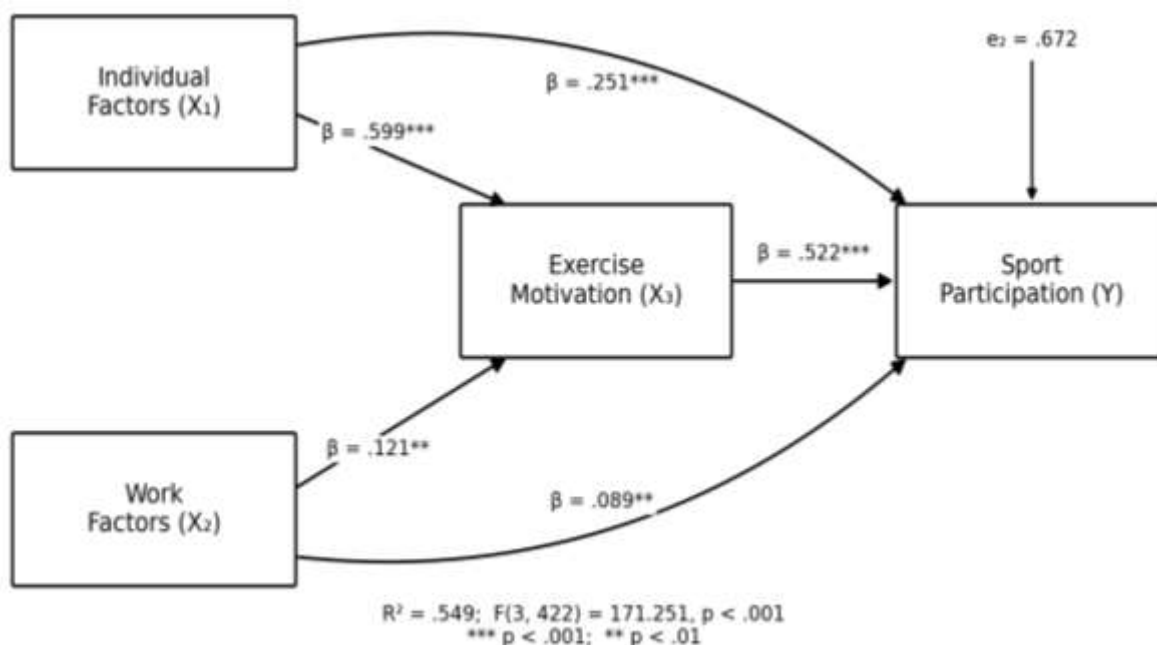


Figure 3 <Path Analysis Diagram with Standardised Coefficients>

Note. Values are standardised path coefficients. e_2 = residual path coefficient for sport participation. *** $p < .001$; ** $p < .01$. N = 426.

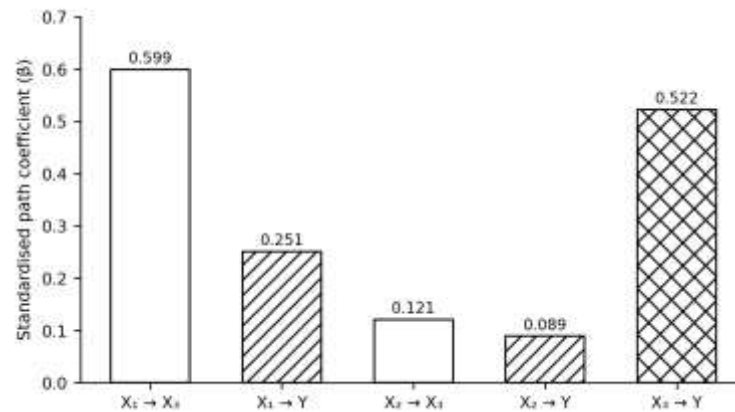


Figure 4 <Comparison of Standardised Path Coefficients>

Note. Bars display the standardised coefficient for each estimated path. Paths terminating at exercise motivation are shown unhatched; paths terminating at sport participation are hatched.

Table 6 <Direct Effects on Sport Participation (N = 426) >

Predictor	β	Contribution (%)	p	Conclusion
Individual factors (X_1)	.251	6.30	< .001	Positive and significant
Work factors (X_2)	.089	0.79	< .010	Positive and significant
Exercise motivation (X_3)	.522	27.25	< .001	Positive and significant

Note. Contribution = $\beta^2 \times 100\%$. $\alpha = .05$ for all tests.

Indirect and total effects

Table 7, along with Figures 5 and 7, breaks down the mediated pathways. For individual factors, the indirect effect through motivation came out to .313 ($.599 \times .522$), which was larger than the direct effect of .251. That gives a total effect of .564, with about 55.5% of it going through motivation. In the case of work factors, the indirect effect was .063 ($.121 \times .522$), smaller than the direct effect of .089. So the total effect is .152, with 41.4% mediated. Because every single path in the model was statistically significant, exercise motivation acts as a meaningful mediator in both pathways. This supports H4 and H5. The mediation here is partial, not full. Both exogenous variables still have significant direct effects even with the mediated parts included.

Table 7 <Indirect and Total Effects on Sport Participation through Exercise Motivation>

Pathway	a ($X \rightarrow X_3$)	b ($X_3 \rightarrow Y$)	Indirect (a $\times$ b)	Direct (c')	Total	Decision
$X_1 \rightarrow X_3 \rightarrow Y$	.599***	.522***	.313	.251***	.564	H4 supported
$X_2 \rightarrow X_3 \rightarrow Y$	.121**	.522***	.063	.089**	.152	H5 supported

Note. Indirect effects were computed as the product of constituent standardised path coefficients ($a \times b$), where $b = .522$ ($X_3 \rightarrow Y$, $p < .001$). Total effect = direct + indirect. Mediation was inferred where both constituent paths were significant.

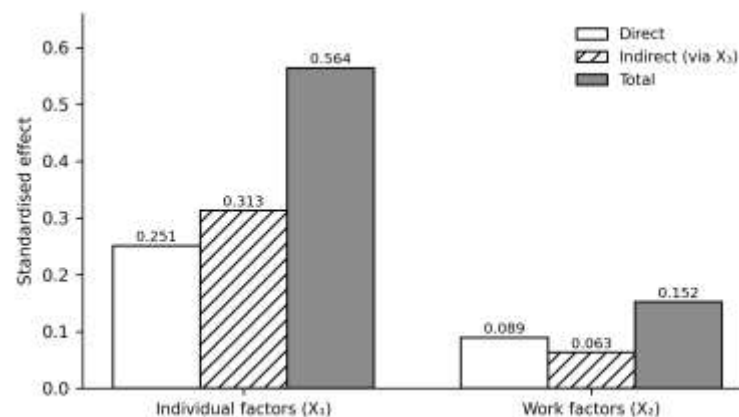


Figure 5 <Direct, Indirect and Total Effects on Sport Participation>

Note. Indirect effects were computed as the product of constituent standardised path coefficients through exercise motivation. Total effect = direct + indirect.

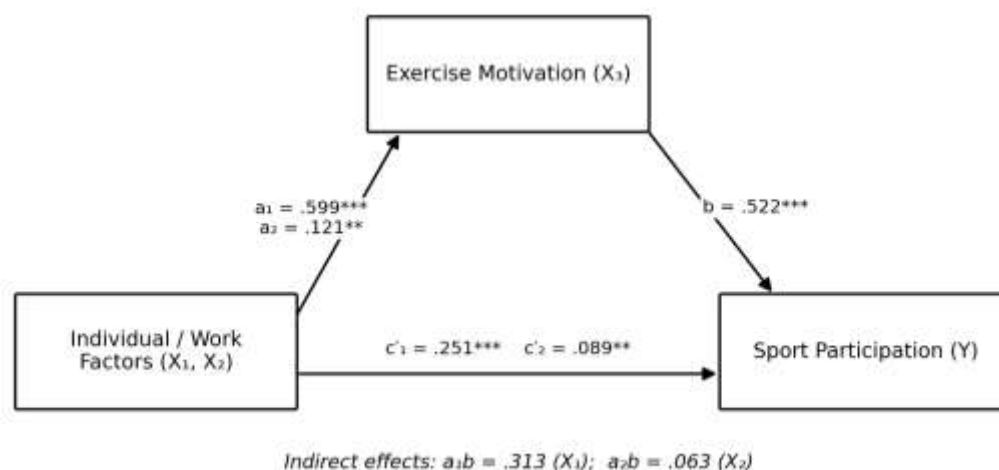


Figure 7 <Mediation Model for Individual and Work Factors>

Note. a = path from exogenous variable to mediator; b = path from mediator to outcome; c' = direct effect controlling for the mediator. *** $p < .001$; ** $p < .01$.

Joint effect of the model

The omnibus test appears in Table 8 and Figure 6. Together, the three predictors accounted for a significant portion of the variance in sport participation. The result was $F(3, 422) = 171.251$, $p < .001$, which supports H6. The multiple correlation was $R = .741$. An R^2 of .549 and an adjusted R^2 of .546 were observed. So individual factors, work factors, and exercise motivation explain 54.9% of the variation. The other 45.1% is due to determinants outside the model. The residual path coefficient was $Pe = .672$. As for the model effect size, f^2 was 1.217, which conventional benchmarks consider large. The difference between R^2 and adjusted R^2 is just .003. That tells us the explanatory power is not an artefact of the number of predictors relative to the sample size.

Table 8 <Model Summary and Omnibus Test of the Structural Equation for Sport Participation>

Source	SS	df	MS	F	p
Regression	213.570	3	71.190	171.251	< .001
Residual	175.427	422	0.416		
Total	388.998	425			
R = .741	$R^2 = .549$	Adjusted $R^2 = .546$	SEE = 0.64475	Pe = .672	$f^2 = 1.217$

Note. Predictors: individual factors, work factors and exercise motivation. Pe = residual path coefficient = $\sqrt{1 - R^2}$. $f^2 = R^2 / (1 - R^2)$; values of .02, .15 and .35 denote small, medium and large effects respectively.

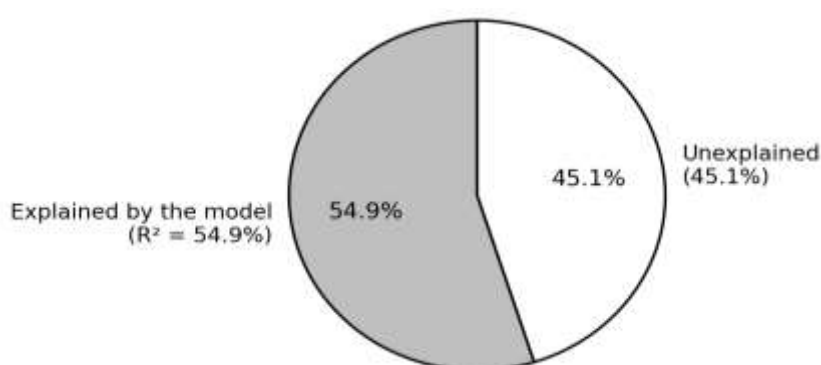


Figure 6 <Variance in Sport Participation Explained by the Model>

Note. $R^2 = .549$ for the model comprising individual factors, work factors and exercise motivation; 45.1% of variance is attributable to determinants outside the model.

Discussion

The model estimated here gives us a clear ordering, though in one way it's uncomfortable. The proximal psychological determinant of sport participation was far stronger than either distal determinant. Employees' internal attributes mattered more than their employment conditions. And the influence of individual attributes reached behavior mainly through motivation, not directly. Each result is theoretically defensible and carries a policy implication that runs counter to the prevailing logic of workplace sport promotion in Indonesian local

government. That logic has historically stressed providing facilities and staging events. Below I interpret each hypothesis in turn, situating them against recent international evidence and tracing the mechanisms that plausibly generated them.

Individual factors and sport participation (H1)

Individual factors had a clear positive direct effect on sport participation. They accounted for 6.30% of the variance along that path. The effect size is modest, but that doesn't make it trivial. Even when you hold motivation constant, personal traits still shape behavior on their own. The mechanism here is most likely about capability, not will. Health status, fitness levels, and past exercise experience determine what someone can actually do at any given moment. An employee who is deconditioned or managing a chronic condition hits a real physiological ceiling. No amount of wanting will raise it. That is the logic of reciprocal determinism at the heart of social cognitive theory, where personal factors, behavior, and environment constantly influence each other (Bandura, 2004).

This finding goes in the same direction as the meta-analytic synthesis of social cognitive theory applied to physical activity by Young et al. (2014). They found self-efficacy and goal-setting consistently linked to activity, while outcome expectations and socio-structural factors were not. Exercise self-efficacy has also been shown to be a reliable correlate in older adults in a recent meta-analysis (Xie et al., 2025). Our result extends that pattern to a working-age public-sector sample and to sport participation specifically, not just broadly defined physical activity.

The small effect size deserves some discussion. It matches what we know about the gaps between intention and behavior and between capability and behavior. People often have the physical ability to be active but don't follow through. Research on teachers (Bogaert et al., 2014) found real but bounded links between activity type and perceived physical and work-related health. And prospective work on leisure-time activity and work ability in health-care staff (Arvidson et al., 2013) also reported associations of moderate rather than commanding strength. Our coefficient of $\beta = .251$ fits comfortably within that range. Practically, it means improving the health and fitness profile of employees is necessary but not sufficient. The capability that comes with it still needs to be mobilized.

Two comparisons are worth noting. Work on physical activity in older adults (Camp et al., 2024) shows that trait self-control mediates the motivation, exercise relationship. That suggests self-regulatory capacity, an individual attribute we didn't measure here, might account for part of the direct effect we're attributing to individual factors. In contrast, research on adults with severe mental illness (Vancampfort et al., 2015) found that autonomous motivation can dominate activity adoption and maintenance even when health status is compromised. That implies the direct capability pathway can be overridden under strong motivational conditions. Both observations point in the same direction as the mediation results reported below.

Work factors and sport participation (H2)

Work factors showed a statistically significant yet substantively tiny direct effect ($\beta = .089$). It accounted for only 0.79% of the variance along that path. That's less than one hundredth of the outcome's variability. With a sample size of 426, the significance test has high statistical power. So we shouldn't confuse statistical detectability with practical importance. The honest takeaway? The occupational environment, as these employees perceive it, matters almost nothing for whether they exercise.

This result genuinely surprises, given how much the workplace health promotion literature emphasizes environmental determinants. So it demands explanation, not dismissal. Three mechanisms make sense. First, restriction of range. Work factors had the lowest mean of all four constructs ($M = 2.9601$) and a relatively narrow standard deviation. That means respondents saw their working conditions as uniformly mediocre. When an environmental variable barely varies, it can't explain differences in an outcome. Second, look at the specific nature of Indonesian bureaucratic employment. With 70.19% of respondents having worked more than a decade, working conditions have turned into a stable backdrop. Individual differences in exercise behavior play out against that background, rather than being actively shaped by it. Third, and most importantly, the effect might not be missing entirely. It could be displaced and channeled through motivation, which is what the mediation analysis suggests.

This displacement interpretation is exactly what the job demands, resources model predicts. The model says job resources mainly work through a motivational process, while job demands operate through a health-impairment process. So their behavioral effects outside work should be indirect rather than direct (Bakker et al., 2023). Empirical tests have consistently shown weak direct associations. A large longitudinal study on Dutch employees found reciprocal links between activity and work-related fatigue, but no longitudinal connection between task demands and activity (de Vries et al., 2016). Research on afterschool program staff similarly found that three types of occupational stress didn't directly predict daily moderate-to-vigorous activity; instead, they

worked through controlled motivation (Deng et al., 2024). Studies on firefighters found that motivation, not just workload, governed perceived health and performance outcomes (Sandrin et al., 2019). Reviews of stress and physical activity have mostly found inverse but mixed associations, and their strength depends heavily on the mediating psychological pathway (Stults-Kolehmainen & Sinha, 2014). Longitudinal profiling of recovery-enhancing processes has also placed job-related antecedents at some distance from behavioral outcomes (Kinnunen & Mäkikangas, 2023).

The convergence is striking. Five independent bodies of research across four countries all find the direct occupational pathway to be weak. And the present study replicates that in a middle-income public-sector setting, where you might think structural constraints would have a stronger effect. The policy takeaway is uncomfortable but clear. Investing in better working conditions without also addressing motivation won't alone boost participation much.

Exercise motivation and sport participation (H3)

In the model, exercise motivation came out as the strongest single determinant. It had a beta of .522 and accounted for 27.25% of the variance along that path. That's more than four times what individual factors contributed and over thirty times the work factors' contribution. This is the study's main substantive result, and it lines up well with self-determination theory. That theory says behavior sticks only as much as its regulation has been internalized (Ryan & Deci, 2000; Ryan & Deci, 2020).

This finding lines up with a huge and consistent body of international evidence. The foundational systematic review on self-determination theory in exercise settings found solid support linking autonomous motivation to exercise. Specifically, identified regulation predicted short-term adoption while intrinsic motivation predicted long-term adherence (Teixeira et al., 2012). Then a meta-analysis of self-determination-based health interventions showed small to medium effects on motivation, need satisfaction, and health behavior (Ntoumanis et al., 2021). In physical education, meta-analytic work has confirmed that autonomous regulation predicts activity outcomes across different educational settings (Vasconcellos et al., 2020). Meanwhile, intervention studies in out-of-school contexts prove that theory-based motivational strategies can boost activity levels in young people (Tapia-Serrano et al., 2023). Behavioral interventions that use motivational interviewing have also led to measurable gains in adult activity outcomes across a large randomized evidence base (Zhu et al., 2024). Studies on exercise prescription schemes show that self-determined regulation predicts better adherence and well-being in overweight patients (Edmunds et al., 2007). And research on intrinsic motivation in structured exercise programs ties it to fitness and body-composition results (Thøgersen-Ntoumani et al., 2016).

The mechanism is well laid out in theory. When exercise gets internalized, it shifts from being an externally imposed chore to something that expresses personal values. That makes it way more resilient to situational obstacles like fatigue, competing demands, bad weather, or missing facilities, which tend to trip up externally regulated behavior. Transcontextual work suggests that once people experience an activity as autonomously motivated and incorporate it into their set of need-satisfying behaviors, they'll keep looking for chances to do it even without environmental support (Hagger & Chatzisarantis, 2016). That explains why in this data, motivation beats the environment by such a big margin.

One caveat is worth noting. The motivation measure lumped intrinsic and extrinsic indicators into a single composite score. So the .522 coefficient reflects motivational quantity, not quality. Self-determination theory says these two types behave differently. Autonomous regulation holds up pretty well against occupational stress, but controlled regulation is more vulnerable (Deng et al., 2024). And controlled motivation has shown only small or inconsistent effects on behavior change in some samples, though it can produce short-term gains in others (Langan et al., 2016; White et al., 2018). So the aggregate coefficient we report here almost certainly hides a more differentiated internal structure. Disaggregating it should be a priority for replication.

The mediating role of motivation for individual factors (H4)

Individual factors didn't shape sport participation directly all that much. They worked through motivation instead. The indirect effect (.313) was larger than the direct one (.251). So 55.5 percent of the total effect of .564 came via motivational pathways. The antecedent path also turned out to be the strongest in the entire model ($\beta = .599$). In other words, individual attributes are better at predicting motivation than they are at predicting actual behaviour.

It all comes down to experiential feedback. Employees who are fit, healthy, and have some exercise experience get a sense of competence from being active. They succeed, they enjoy it, and they bounce back quickly afterwards. That competence satisfaction is one of the three basic psychological needs self-determination theory says fuel internalisation. And the systematic review evidence backs this up: competence satisfaction and intrinsic motives consistently predict exercise participation across all sorts of samples and settings (Teixeira et al., 2012). On the flip side, employees who are out of shape find exercise tough and unpleasant. That frustration

undermines competence and chips away at autonomous regulation. So the individual factor matters less as a physical enabler and more as a biographical source that feeds motivational orientation.

This result lines up with several recent studies. Bayesian mediation work in older adults found both direct and indirect effects of intrinsic motivation on exercise time, with self-control acting as a mediator and extrinsic motivation working through full mediation (Camp et al., 2024). Research on autonomous motivation and leisure-time activity showed that self-regulation techniques help explain how motivation turns into behaviour (Nurmi et al., 2016). Meta-analytic evidence on self-efficacy and activity in older adults pointed to a similar psychological transmission channel (Xie et al., 2025). Work on motivational orientation across the adult lifespan has documented systematic shifts in regulation type based on personal characteristics (Brunet & Sabiston, 2011). And intervention research among disadvantaged adult women has shown that motivational and affective outcomes can themselves be changed, meaning the mediator is a legitimate target for intervention rather than a fixed trait (Sanz-Remacha et al., 2021).

The practical implications are pretty big. If more than half the effect of individual attributes passes through motivation, then programmes that boost fitness without paying attention to how the experience is framed will leave the bigger part of their potential payoff sitting on the table.

The mediating role of motivation for work factors (H5)

Work factors also passed along a fair share of their influence through motivation, about .063 of a total effect of .152, or 41.4%. But the whole pathway was weak. The antecedent path was only slight ($\beta = .121$), and the resulting indirect effect came out to about one-fifth the size of the same effect for individual factors. In this sample, the occupational environment is just a marginal input to motivation.

This finding partly goes against the job demands, resources model, which predicts a substantial motivational process driven by job resources (Bakker et al., 2023). There are two possible explanations. The first has to do with construct scope: the work factor instrument lumped demands (workload, working hours, sedentary job character) and resources (leadership support, workplace exercise culture, institutional programmes) into a single composite. Since the model says demands and resources drive distinct and partly opposing processes, combining them into one score would weaken both. That's a measurement artifact, not a theoretical contradiction, and it points to a clear methodological fix for future studies.

The second explanation is contextual. Indonesian bureaucratic employment runs on standardised hours, limited schedule autonomy, and largely ceremonial institutional sport offerings. In an environment like that, there may simply be too little variation in real job resources for the motivational process to kick in. Comparative evidence lines up with this reading. Research on Dutch employees with high job control found only limited evidence that psychosocial work characteristics affect leisure-time activity, and the authors chalked that up to the relatively healthy work environment they studied (de Vries et al., 2016). When job control is either uniformly high or uniformly low, its explanatory power collapses for the same statistical reason.

Still, the pathway isn't empty. Studies on job demands and resources among staff working under resource constraints have shown that neighbourhood and organisational characteristics shape the demands, stress relationship (Affrunti et al., 2018). And the occupational stress literature confirms that work stressors get to behavior mostly through motivational channels rather than directly (Deng et al., 2024; Stults-Kolehmainen & Sinha, 2014). Intervention evidence backs the same conclusion from the opposite angle: multicomponent workplace programmes that mix environmental modification with behavioural and motivational components cut occupational sedentary behaviour more effectively than environmental change alone (Zhou et al., 2023). Reviews of workplace sitting interventions have also reached similar conclusions about the need for behavioural components (Shrestha et al., 2018; Wang et al., 2024). The takeaway for this setting is not that the workplace doesn't matter. It's that it matters through psychology, and that the workplace resources currently available to Indonesian civil servants are too thin to generate much of that.

Joint explanatory power and theoretical integration (H6)

Together, the three predictors explained 54.9% of the variance in sport participation. The result is statistically solid: $F(3, 422) = 171.251$, $p < .001$, with an f^2 of 1.217. For a behavioral outcome measured through self-report, that's a strong figure. It tells us the model picked up on the most important factors at play in this group. The other 45.1% comes from things outside the model. What might those be? Access to facilities, social networks, family duties, financial constraints, weather and season, and, importantly, self-regulatory skill. Mediation research shows this skill is a separate driver that motivation measures alone do not capture (Camp et al., 2024; Nurmi et al., 2016).

Looking at the theory, these results fit best when we read the frameworks together instead of in competition. Self-determination theory got the strongest boost. Motivation came through as the immediate driver and the

main mediator, just as the theory says it should. Social cognitive theory also holds up, especially its focus on personal factors and mutual causation. Individual attributes operated both directly and through cognitive-motivational appraisal. The job demands-resources model receives some backup too. Its core idea, that job conditions reach non-work behavior indirectly through motivation, is confirmed. But the effect here was much smaller than what the model usually finds. The ecological perspective says behavior is shaped at multiple nested levels (Sallis et al., 2006). That holds in principle, but in practice the intrapersonal side clearly dominated the organizational side here. Finally, this speaks to the World Health Organization's view of physical activity promotion as a multi-sectoral effort (Bull et al., 2020). The tools a regency government controls, things like facilities, events, and policy circulars, hit exactly the determinants that turned out weakest. That points to a mismatch between the policy toolkit and the real behavioral mechanism.

The epidemiological picture makes these findings urgent. Roughly one in three adults worldwide does not move enough, and that number is climbing (Strain et al., 2024; Guthold et al., 2018). It accounts for a large and growing share of the preventable non-communicable disease burden (Lee et al., 2012; Kohl et al., 2012). The economic cost to health systems is projected in the hundreds of billions (Costa Santos et al., 2023; Ding et al., 2016). A workforce sitting at the midpoint of every measured construct, as this one does, brings both risk and opportunity. The risk is clear: the trajectory of sedentary administrative employment leads downward. The opportunity is just as clear: the binding constraint has been identified, and it is modifiable.

The revealed preference data backs this reading strongly. Running and group calisthenics together drew 465 of the total selections. Facility-based activities? Hardly any. Employees naturally gravitate toward what is accessible, low-cost, and socially comfortable. So program design should work with that grain. Think scheduled group runs, workplace calisthenics, or better walking infrastructure. That approach will likely outperform capital investment in specialized facilities. It is also considerably cheaper, and that matters a great deal for a regency budget.

Table 9. Comparison of the Present Findings with Recent International Studies

Author (year)	Country / setting	Sample	Main findings	Agreement	Remaining gap
Teixeira et al. (2012)	Multi-country review	66 studies	Autonomous motivation consistently predicts exercise; intrinsic regulation predicts long-term adherence	High — supports H3	No public-sector or LMIC workforce samples
Ntoumanis et al. (2021)	Multi-country meta-analysis	SDT health interventions	Small-to-medium effects on motivation and health behaviour	High — supports H3 and H4	Effects estimated for interventions, not observational models
Deng et al. (2024)	United States (afterschool staff)	58 staff, accelerometer	Occupational stress predicted MVPA indirectly via controlled motivation, not directly	High — supports H2 and H5	Small sample; single occupational sector
de Vries et al. (2016)	Netherlands	2,275 employees, 2 waves	Reciprocal PA-fatigue relations; no longitudinal task demand-PA association	High — supports weak H2	High-job-control setting limits generalisability
Camp et al. (2024)	United Kingdom	430 older adults	Direct and indirect effects of intrinsic motivation on exercise; extrinsic motivation fully mediated	Moderate — supports H4	Older adults, not working-age employees
Young et al. (2014)	Multi-country meta-analysis	SCT and PA studies	Self-efficacy and goals consistently associated with PA; socio-structural factors not	Moderate — supports H1 and weak H2	Does not decompose direct vs mediated effects
Xie et al. (2025)	Multi-country	Healthy older adults	Exercise self-efficacy reliably associated with PA	Moderate — supports H1	Age group differs from the present sample

Author (year)	Country / setting	Sample	Main findings	Agreement	Remaining gap
Zhou et al. (2023)	meta-analysis Multi-country	RCTs, office workers	Multicomponent interventions reduce occupational sedentary behaviour	Moderate — supports integrated implications	Outcome is sitting time, not sport participation
Zhu et al. (2024)	meta-analysis Multi-country	RCTs, adults	Motivational interviewing improves PA outcomes	Moderate — supports H3 implications	Clinical rather than workplace delivery
Strain et al. (2024)	163 countries	5.7 million adults	31.3% insufficiently active in 2022; rising trend	Contextual	Surveillance only; no determinant modelling
Andriyani et al. (2020)	Indonesia	166 studies (youth)	Indonesian PA research dominated by cross-sectional self-report; few theory tests	Contextual — confirms the identified gap	No adult or public-sector workforce evidence

Note. PA = physical activity; MVPA = moderate-to-vigorous physical activity; SDT = self-determination theory; JD-R = job demands-resources. "Agreement" denotes the degree of convergence with the present findings.

Similar findings have been consistently reported across recent international studies (Table A), including Teixeira et al. (2012), Ntoumanis et al. (2021), Deng et al. (2024), Zhou et al. (2023), Zhu et al. (2024), Camp et al. (2024), and Xie et al. (2025).

Table 10. Theoretical Contributions of the Present Study

Theory	Present finding	Contribution	Scientific implication
Self-determination theory	Motivation was the strongest direct predictor ($\beta = .522$) and mediated 55.5% of the effect of individual factors	Confirms the internalisation mechanism in a low- and middle-income public-sector workforce not previously studied	Supports the cross-cultural generality of SDT and identifies motivational quality as the priority construct for measurement refinement
Social cognitive theory	Individual factors acted both directly ($\beta = .251$) and through motivation (.313)	Empirically separates the capability and appraisal components of personal determinants	Suggests that person-level determinants should be modelled as dual-pathway rather than unitary predictors
Job demands-resources model	Work factors reached behaviour largely indirectly, but the whole pathway was weak (total effect .152)	Supports the indirect-transmission proposition while bounding its magnitude in low-autonomy bureaucratic settings	Indicates that demands and resources must be measured separately; aggregation attenuates both processes
Ecological model of physical activity	Intrapersonal determinants dominated organisational determinants	Quantifies the relative weight of two ecological levels within one estimated model	Cautions against assuming that higher ecological levels exert proportionally larger effects in every context
Theory of planned behaviour	Motivational strength predicted behaviour strongly but explained 27.25% of the attributable variance, leaving a substantial residual	Provides further evidence of an intention-behaviour gap in an occupational sample	Points to volitional and self-regulatory constructs as the next modelling frontier
WHO physical	The determinants most amenable to regency-level	Identifies a misalignment between available policy	Argues for multi-sectoral strategies that pair

activity framework	policy instruments were the weakest	levers and the operative behavioural mechanism	environmental provision with motivational design
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Note. SDT = self-determination theory; SCT = social cognitive theory; JD-R = job demands-resources model; TPB = theory of planned behaviour.

Table 11. Evidence-Based Policy Recommendations by Stakeholder

Stakeholder	Recommendation	Expected impact	Priority
Regency Government (Bupati, Regional Secretariat)	Issue a regulation embedding a weekly protected activity period into official working hours and reporting it as an institutional performance indicator	Converts exercise from discretionary to normative behaviour; addresses the strongest reported barrier (time)	High
Human Resource Department (BKPSDM)	Incorporate physical fitness and activity indicators into staff development records and periodic health screening, with feedback to individuals	Strengthens individual factors ($\beta = .251$ direct, $.313$ indirect) and supplies competence feedback	High
Office of Youth, Sport and Tourism	Reallocate programme budget from ceremonial events towards recurring, low-barrier group activities — scheduled runs, workplace calisthenics, walking groups — matched to the revealed preferences of employees	Aligns provision with the 465 selections recorded for running and calisthenics; high participation yield per unit cost	High
Public Health Office (Dinas Kesehatan)	Deliver autonomy-supportive counselling within existing occupational health services, emphasising choice, meaningful rationale and personal relevance rather than directive advice	Targets the strongest determinant ($\beta = .522$) using an evidence-based delivery model	High
Heads of regional government organisations	Establish visible leadership participation and unit-level activity norms; designate an activity focal point in each organisation	Addresses the workplace exercise culture component of work factors, the weakest measured construct	Medium
Regional planning agency (BAPPEDA)	Fund walkable and cycle-accessible infrastructure around government office complexes	Reduces structural barriers to the two most preferred activity modes	Medium
National policy makers (Kemenpora, Ministry of Health)	Integrate civil-service physical activity indicators into the Sport Development Index and occupational health reporting	Creates accountability and enables cross-regency benchmarking	Medium
Workplace health promotion practitioners	Design multicomponent programmes that combine environmental modification with motivational and behavioural components rather than either alone	Consistent with meta-analytic evidence that multicomponent designs outperform single-strategy designs	Medium

Note. Priority was assigned on the basis of the magnitude of the corresponding path coefficient, the modifiability of the determinant, and the implementation cost relative to a regency budget.

Practical implications

These findings point to one core principle: lead with motivational design, then build the structure to support it. Exercise motivation accounted for more than four times the variation that individual attributes explained, and over thirty times the variation that workplace conditions explained. So putting resources into motivational quality gives you a much better return than spending on facilities alone. That doesn't mean facilities are useless. It just means they shouldn't be the first move.

For the Regency Government, the single most powerful tool is regulatory, not financial. If you embed a protected weekly activity period into official working hours and track participation as an institutional performance indicator, exercise stops being a voluntary use of scarce personal time and becomes a normal part of the work week. That directly tackles the barrier that Indonesian national survey data identify as the biggest one.

For the Human Resource Department, periodic fitness assessments with personalised feedback serve two jobs at once. They improve the individual factors that have a direct effect on participation. And by giving people evidence of their own competence and progress, they feed the motivational pathway that carries most of the effect. But feedback needs to be informational, not evaluative. Controlling feedback actually undermines the autonomous regulation it's trying to build.

For the Office of Youth, Sport and Tourism, the preference data gives a remarkably clear planning signal. Employees overwhelmingly chose running and group calisthenics. Activities that require lots of facilities or club membership attracted almost no interest. So recurring, low-barrier group activities scheduled at predictable times will reach far more employees per rupiah than annual competitions or building specialised facilities.

For the Public Health Office, occupational health contacts are an existing delivery channel that is still underused. Brief autonomy-supportive counselling (offering a meaningful rationale, acknowledging obstacles, providing choice among options, and avoiding directive prescription) can be folded into routine screening at very low marginal cost.

For heads of regional government organisations, the lever that matters is normative, not material. When leaders visibly participate and a unit-level activity focal point is named, that addresses the workplace exercise culture component of work factors. That component had the lowest mean score of any construct we measured. For regional planning, investing in walkable and cycle-accessible infrastructure around government office complexes supports the two activity modes employees already prefer. And it does so for the wider community too, not just for civil servants. For national policy makers, adding civil-service activity indicators to the Sport Development Index and occupational health reporting would create the accountability structure that doesn't exist right now. It would also allow comparison across regencies.

Finally, for workplace health promotion practitioners, the results back up a conclusion the international intervention literature has already reached on its own: multicomponent programmes that combine environmental change with behavioural and motivational strategies consistently beat single-strategy designs. This study helps explain why. Changing the environment alone targets the weakest link in the causal chain.

Strengths and limitations

The study has several genuine strengths. A sample of 426 respondents is larger than the calculated minimum by a comfortable margin, offering solid statistical power for path estimation, more than 80 cases per structural parameter. Recruitment covered all 54 regional government organisations in the regency and reached all three position strata. That supports generalisation across the local civil service rather than just one agency. The instruments went through a documented three-stage process: content validation by three disciplinary experts, pilot testing, and item-level psychometric screening. Thirteen of the 66 items were dropped on empirical grounds. Every assumption behind ordinary least squares path estimation was tested and held up. Most importantly, the decomposition of total effects into direct and mediated components tackles a question the existing Indonesian literature has not asked, not whether determinants matter, but through what mechanism and in what proportion.

The limitations are just as specific. First, the cross-sectional design blocks causal inference. The path directions follow theoretical specification, not temporal order, and reciprocal causation is entirely plausible. Participation can build motivation just as easily as motivation drives participation, and longitudinal work has already shown that kind of reciprocity between activity and work-related fatigue. Second, purposive sampling with voluntary online participation introduces self-selection. Employees already interested in sport were probably more likely to respond, which may inflate the mean levels reported, although its effect on the estimated coefficients is harder to predict. Third, every construct came from self-report on a single occasion, so common method variance may have inflated the observed associations. Objective measurement of participation through accelerometry or attendance records would give a more stringent test. Fourth, the exercise motivation scale produced $\alpha = .651$, acceptable but the weakest of the four instruments, and lumped intrinsic and extrinsic regulation into one composite. That closes off the autonomous, controlled distinction that self-determination theory hinges on. Fifth, the work factor scale similarly combined job demands and job resources, even though the job demands, resources model treats them as drivers of separate processes. This aggregation is the most likely reason the occupational pathway came out unexpectedly weak, and it should be seen as a measurement limitation, not a substantive finding about workplaces. Sixth, the source analysis did not keep unstandardised coefficients, standard errors, or confidence intervals, so bootstrapped confidence intervals for the indirect effects, now standard in mediation research, could not be calculated. The mediation inference rests only on the significance of constituent paths. Seventh, the study happened in a single regency in South Sumatra, and Indonesian local governments differ a lot in resources, geography, and organisational culture.

These limitations draw out a clear research agenda. Priority should go to longitudinal or cross-lagged designs that can establish temporal ordering. To instruments that separate autonomous from controlled regulation and job demands from job resources. To objective measurement of participation. To bootstrapped estimation of indirect effects with confidence intervals. To multi-regency and multi-country comparisons that would test whether the dominance of intrapersonal over organisational determinants is a feature of Indonesian bureaucratic employment or something more general. And to intervention trials that directly manipulate motivational quality, only those can turn the associations reported here into causal knowledge.

Conclusions

This study examined the relationships among individual factors, work factors, exercise motivation, and sport participation among Indonesian civil servants using a path analysis approach. The findings indicate that exercise motivation is the strongest factor associated with sport participation, whereas individual factors show both direct and indirect associations through exercise motivation. In contrast, work factors demonstrate a comparatively weaker association with sport participation, suggesting that organizational conditions alone are insufficient to encourage sustained engagement in sport without adequate motivational support. Overall, the proposed model explained a substantial proportion of the variance in sport participation, indicating that the integration of individual, occupational, and motivational factors provides a useful framework for understanding sport participation among public-sector employees.

From a theoretical perspective, the findings support the complementary roles of Self-Determination Theory, Social Cognitive Theory, and the Job Demands–Resources model. The results suggest that exercise motivation functions as the primary psychological pathway linking individual characteristics to sport participation, while occupational factors appear to operate mainly through indirect motivational processes. These findings extend existing evidence by demonstrating that motivational mechanisms remain important within a public-sector workforce in a lower-middle-income country, a population that has received limited attention in previous studies.

The practical implications are equally important. Workplace health promotion strategies should prioritize interventions that strengthen autonomous exercise motivation alongside supportive organizational environments rather than relying primarily on facilities or occasional sport events. Low-barrier activities, regular participation opportunities, supportive leadership, and autonomy-supportive organizational practices may provide more sustainable approaches for increasing sport participation among civil servants.

Several limitations should be acknowledged. The cross-sectional design precludes conclusions regarding causal relationships, the purposive sampling approach may limit the generalizability of the findings, and all variables were measured using self-reported questionnaires, which may introduce response bias. Future studies should employ longitudinal or experimental designs, probability-based sampling, and more comprehensive measures that distinguish job demands from job resources and intrinsic from extrinsic motivation. Examining additional determinants, such as self-efficacy, self-regulation, social support, and environmental accessibility, may further improve the explanatory power of future models and strengthen evidence for workplace physical activity promotion.

Acknowledgments

The authors thank the Regent of Ogan Komering Ulu Timur, the Regional Secretariat, and the Head of the Office of Youth, Sport and Tourism of Ogan Komering Ulu Timur Regency for granting institutional permission and facilitating access to the participating regional government organisations. The authors are grateful to the three expert reviewers who conducted the content validation of the research instruments, and to all civil servants who gave their time to complete the questionnaire.

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