Impact of service quality, communication, and financial aspects on kurash athletes performance through motivation
Impacto de la calidad del servicio, la comunicación y la financiación en el rendimiento de los atletas kurash a través de la motivación

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Abstract

Introduction: This study extends our previous research about the effect of service quality on achievement motivation in kurash sport in Indonesia that have been published on retos.
Objective: This study aims to analyze the effect of service quality, communication, and financial aspects on athlete performance through motivation in exercising Kurash in Indonesia. Methodology: This research employs a quantitative correlational approach, utilizing structural equation modeling (SEM) with SmartPLS 4 for student, complemented by regression analysis using SPSS. The sample comprised 100 Kurash athletes (61 male and 39 female). The male category comprised 61 athletes with a mean age of 16.2±1.8 years, an average training experience of 2.8 ± 5.3 years, and an average weekly training duration of 4.5 ± 2.1 hours. The female category consisted of 39 athletes with a mean age of 22.8±8.8 years, an average training experience of 5.7 ± 8.8 years, and an average weekly training duration of 8.2 ± 3.1 hours.
Results: Correlation analysis revealed significant relationships between the predictor variables (service quality, communication, and financial aspects) and the mediator variable (athlete motivation). Linear Regression Analysis indicated significant relationships with p-values less than 0.05 in several aspects.
Discussion: These findings underscore the critical importance of effective service quality management, open communication channels, and adequate financial support in fostering athlete motivation and ultimately enhancing the performance of Kurash athletes.

Keywords

Regression; kurash; smartpls; athletes.

Resumen

Introducción: Este estudio amplía nuestra investigación anterior sobre el efecto de la calidad del servicio en la motivación de logro en el deporte kurash en Indonesia que se han publicado en retos.
Objetivo: Este estudio tiene como objetivo analizar el efecto de la calidad del servicio, la comunicación y los aspectos financieros en el rendimiento del atleta a través de la motivación en el ejercicio de Kurash en Indonesia.
Metodología: Esta investigación emplea un enfoque cuantitativo correlacional, utilizando el modelado de ecuaciones estructurales (SEM) con SmartPLS 4 for student, complementado por el análisis de regresión con SPSS. La muestra estuvo compuesta por 100 atletas kurash (61 hombres y 39 mujeres). La categoría masculina estaba formada por 61 atletas con una edad media de 16,2±1,8 años, una experiencia media de entrenamiento de 2,8 ± 5,3 años y una duración media del entrenamiento semanal de 4,5 ± 2,1 horas. La categoría femenina estaba formada por 39 atletas con una edad media de 22,8±8,8 años, una experiencia media de entrenamiento de 5,7 ± 8,8 años y una duración media del entrenamiento semanal de 8,2 ± 3,1 horas. La recogida de datos consistió en la administración de cuestionarios validados, complementados con entrevistas a atletas seleccionados al azar.
Resultados: El análisis de correlación reveló relaciones significativas entre las variables predictoras (calidad del servicio, comunicación y aspectos financieros) y la variable mediadora (motivación del deportista). El análisis de regresión lineal indicó relaciones significativas con valores p inferiores a 0,05 en varios aspectos.

Palabras clave

Regresión; kurash; smartpls; atletas.
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Introduction

Many types of fighting sports exist today, and there are organizations at the world level, one of which is Kurash. Kurash is a sport that originated in the country of Uzbekistan, and it will continue to grow throughout the world (Ahmedov & Abdulakhatov, 2023). Currently, Kurash has been officially introduced and recognized in Indonesia, with the establishment of a national governing body. The development of Kurash in Indonesia is a promising endeavor, marked by significant growth and enthusiasm. However, addressing the challenges related to awareness, infrastructure, financial support, and cultural perception is essential for ensuring the sport's continued success and sustainability in the country (Koptileuovich, 2025). Numerous factors contribute to this progress, one of which is the quality of services provided (Kurniawan et al., 2021), (Cho et al., 2022), (Nachucho et al., 2023). Service quality is a critical aspect for all sports clubs, even those with competitive orientations (Nugroho et al., 2021), (Nugroho et al., 2023). Therefore, it can be concluded that service quality is the foundation for developing a sport, from the amateur level to the professional level. Ideally, service quality encompasses five dimensions: tangibility, empathy, reliability, responsiveness, and assurance (Prabowo et al., 2024). These five factors have an important role in assessing the performance of coaches, organizations in sports clubs, and facilities for training programs (Huang & Kim, 2023), (Polyakova & Ramchandani, 2023), (Sousa et al., 2024). The maximum quality of service provided will provide a sense of satisfaction for athletes who train. Previous research has demonstrated that athlete satisfaction directly and indirectly influences athlete motivation (Ballesta & Santana, 2022). Mandan et al. further emphasize the significant impact of service quality within sports clubs on athlete achievement (Mandan et al., 2024).

External factors such as effective communication play an important role in influencing an athlete's performance. Clear and open communication between coach and athlete can increase understanding and confidence and strengthen the coach-athlete relationship. It creates a more productive training environment and supports athlete motivation. In this context, motivation serves as a variable that connects communication with athlete performance. Athletes who feel listened to and understood through good communication are more likely to feel motivated and increase their efforts in training and competition. Ideally, effective communication encompasses various aspects, including instructional communication, constructive feedback, and tactical communication (Estimurti et al., 2024). Youngsook highlights the significance of effective communication within sports teams, emphasizing its role in fostering positive interpersonal relationships, enhancing a sense of ownership and responsibility among athletes, and reinforcing intrinsic motivation (Kim & Park, 2020). Furthermore, Galily et al. state that effective communication between coaches and athletes plays a role in managing expectations and increasing self-confidence, which are the main factors in motivation and achieving better results (Galily et al., 2021). Other study conducted by (Arief et al., 2023), also confirms that open and effective communication between coaches and athletes can increase the motivation of taekwondo athletes, which directly affects their performance. Good communication facilitates a better understanding of training objectives, enhances a sense of community, and strengthens the athlete's commitment to training and competition.

Financial aspects that include the financing of training facilities, trips to competitions, and meeting the welfare needs of athletes play an important role in creating an environment that supports the development of athletes. According to (Mogaji et al., 2021), adequate financial support gives athletes the opportunity to focus on training without worrying about costs or logistics, which in turn strengthens their intrinsic motivation. When athletes feel they have sufficient resources to overcome physical and mental challenges, they will be more motivated to achieve their goals and improve their performance on the field. Other study also shows (Osiobe et al., 2023) that stable and reliable financial support increases the sense of security for athletes, which plays a major role in increasing their motivation. Athletes who are not burdened by financial issues are more likely to focus on developing skills and strategies, which will have a direct effect on their performance in the competition. Furthermore, Di Simone and Zanardi (Di Simone & Zanardi, 2020) confirm that when athletes receive sufficient financial support from sports sponsors or organizations, it contributes to their increased motivation to achieve better performance, as they feel they have full support to develop. This support, whether directly in the form of funds or facilities, helps them reduce external barriers and increase focus on their goals. However, until now, there have been no research results on the effect of service quality, communication, and uniqueness on athlete performance through motivation in fighting sports, especially kurash sports.

In this study, external factors such as service quality, communication, and financial aspects will be used as independent variables to be analyzed to determine the extent of the influence given on the performance of kurash athletes through motivation as a mediator. This research method uses structural equating modeling and linear regression analysis so that the results of this study can explain more systematically and in detail the importance of the quality of communication services and finance, which can affect the performance of kurash sports athletes. As well as to examine the benefits of this research model as a reference basis for related development.

The objectives of this study were to analyze the influence of service quality, communication, and financial aspects on the performance of kurash athletes, with motivation serving as a mediating variable. The sub-objectives included examining the role of service quality in athlete satisfaction and performance, investigating the impact of effective communication on athlete motivation, and evaluating how financial support affected athlete motivation and performance. Additionally, this research aimed to contribute to the understanding of how these factors could be leveraged to improve the development of kurash athletes and provide a foundation for future studies in sports development.

Method

This research is a descriptive-correlational study that aims to reveal the extent of correlation or influence of research variables, namely service quality, communication, and financial aspects on motivation and performance of kurash athletes at the regional or regional level. The research design used was selected and developed based on the theoretical framework. By defining the important role of service quality in sports as a factor influencing athlete motivation, communication is also considered to be an important factor contributing to athlete performance and achievement (Donnelly et al., 2016). With respect to financial factors, emphasis is placed on the fact that financial status is not a primary need for athletes. However, adequate finances can drive athlete performance and satisfactory achievement (Elia et al., 2020). Based on the audited framework above, the researcher illustrates the research paradigm on the relationship between service quality variables, communication, financial aspects, motivation, and athlete performance, as shown in Figure 1, which is also the design in this correlational research.

Figure 1. Correlational research design
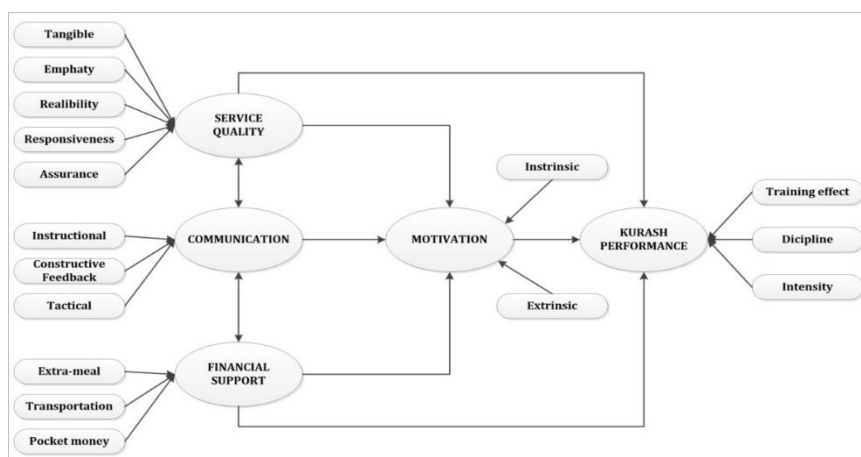
Participants

The study population comprised all Kurash athletes in Indonesia. However, the sample selection employed a purposive sampling technique, focusing on active athletes who had achieved champion status at the regional or national level. The participants in this study were 100 Kurash athletes in Indonesia, divided into two categories based on gender, namely male and female, according to KCAO (Kurash Confederation of Asia-Oceania) rules. The male category comprised 61 athletes with a mean age of 16.2±1.8 years, an average training experience of 2.8 ± 5.3 years, and an average weekly training duration of 4.5 ± 0.0 hours. The female category consisted of 39 athletes with a mean age of 22.8±8.8 years, an average training experience of 5.7 ± 8.8 years, and an average weekly training duration of 8.2 ± 3.1 hours.

Procedure

The research commenced with a preliminary stage involving observational studies of training facilities and competitions at the regional and national levels. These observations informed the identification and formulation of research problems. Subsequently, a brief screening of athletes was conducted to identify potential participants who met the study criteria. To make observations faster and more flexible, the researchers provide an online platform, Zoom, for meeting with coaches and athletes.

In the second stage, a comprehensive literature review was conducted, followed by the organization of focus group discussion (FGD) with academic experts in sports coaching and nationally licensed Kurash coaches. These discussions informed the development of the research instruments. The results of the second stage are several service quality factors consisting of five indicators, namely Tangible, Empathy, Reliability, Responsiveness, and Assurance, which become independent variables (Nugroho et al., 2021), (Nugroho et al., 2023), (Prabowo et al., 2024), (Juita et al., 2024), (Mandan et al., 2024)). Communication factors were identified as instructional communication, constructive feedback, and tactical communication (Ansell & Spencer, 2022). The financial aspect consists of three indicators: extra meals, transportation, and pocket money. Motivation consists of intrinsic, such as finding self-esteem and self-improvement, and extrinsic, such as the need for social recognition and a dual career (Quinaud et al., 2021). The motivation is a dependent variable that relates to kurash performance variable, which also acts as an influencing factor. This factor consists of three indicators: training effect, discipline, and intensity (Mandan et al., 2024).

In the third stage, data were collected using a questionnaire administered via Google Forms. The service quality questionnaire comprised 52 items, adapted from the Service Quality Assessment Scale (Ferri et al., 2017). To ensure content validity and contextual appropriateness for the sports setting, several items were reworded in consultation with experts in sport sciences and educational measurement. A pilot test was then conducted with a sample of 30 respondents to assess item clarity and relevance. Subsequently, an exploratory factor analysis (EFA) was performed to examine the underlying factor structure, followed by item analysis to evaluate factor loadings. Items with loading values below 0.50 were eliminated, consistent with common thresholds for construct validity (Hair et al., 2017). After this process, 30 items were retained. Reliability was assessed using Cronbach's alpha, with all subscales exceeding the acceptable level of 0.70, indicating good internal consistency (Thorndike, 1995). Each item in the questionnaire was rated on a 5-point Likert scale, ranging from 1 (very poor) to 5 (very good).
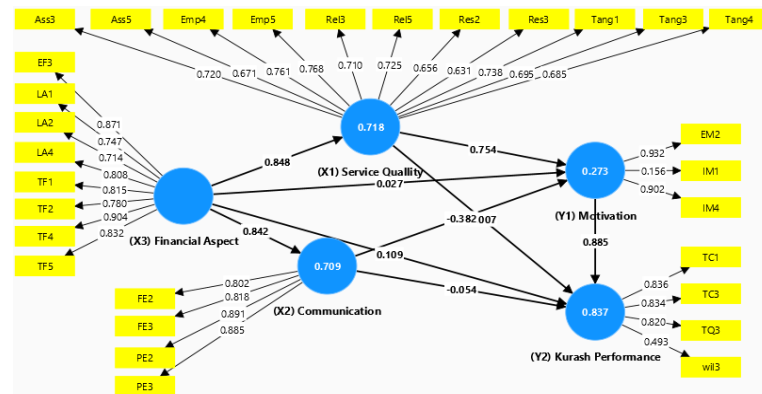
Data analysis

The analysis in this study utilized SmartPLS 4 for student to estimate the parameters of the research model and assess the correlations among the variables. This study identified three independent variables: service quality, communication, and financial support, and two dependent variables: motivation and athlete performance. The primary objective was to investigate the causal relationships between these variables.

Figure 2 provides a visual representation of the structural equation model, illustrating the relationships between the variables and their respective indicators. The model comprises five main variables and sixteen indicators: 1) Service Quality, measured by five indicators: tangibility, empathy, reliability, responsiveness, and assurance. 2) Communication, measured by three indicators: instructional communication, constructive feedback, and tactical communication. 3) Financial Support, measured by three indicators: extra meal costs, transportation costs, and allowances. 4) Motivation, measured by two indicators: intrinsic and extrinsic motivation. 5) Kurash Performance, measured by three indicators: training effect, intensity, and discipline. The information presented above can be seen in Figure 2. The figure shows a strong correlation between almost all indicators, ranging from 0.592 to 0.935.

In addition to using SmartPLS 4 for students, linear regression between dependent variables and independent variables was also applied. In general, regression analysis is concerned with predicting the mean value of the dependent variable Y based on the known values of one or more independent variables of Xi. Models with dependent variables Y and p independent variables X1, X2, X3, ...Xp can be written as $Y_i = \beta_o + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_p X_p + \varepsilon_i$. β_o indicates intercept, $\beta_1, \ldots, \beta_p$ is the partial regression coefficient (slope), and ε_i is the residual term.

Basically, βo and βi are estimated to be as close as possible to the appropriate population parameters using the ordinary least squares (OLS) method.

Figure 2. Correlation between indicators and variables

It is also a common statistical data analysis technique that uses one independent variable to predict the value of the dependent variable. In other words, the linear regression line has the equation Y = a + bX, where X is the explanatory variable and Y is the dependent variable. In this study, the explanatory variable consists of three things, namely service quality, communication and financial aspects, motivation, and athlete performance as a dependent variable. The analysis was carried out with SPSS software (version 22.0 for Windows 10 64bit). To demonstrate how Structural Equation Modeling (SEM) and Linear Regression Analysis were performed manually using the variables Service Quality, Communication, Financial Support (independent variables), and Motivation and Athlete Performance (dependent variables), the following example was provided to help readers better understand the approach used in this study.

We starting by using the assumption of Independent Variables (IVs): Service Quality (X1), Communication (X2), and Financial Support (X3), and Dependent Variables (DVs): Motivation (Y1) and Athlete Performance (Y2). For the SEM setup, Service Quality (X1) had three indicators: Tangibility (X1_1), Reliability (X1_2), and Assurance (X1_3); Communication (X2) had two indicators: Instructional Communication (X2_1) and Feedback (X2_2); Financial Support (X3) had two indicators: Meal Support (X3_1) and Transport Allowance (X3_2); Motivation (Y1) had one indicator: Intrinsic Motivation (Y1_1); and Kurash Performance (Y2) had one indicator: Performance Effect (Y2_1). After that, we performed the measurement model to determine how the observed variables (indicators) related to the latent variables (constructs). The measurement model equations were as $X1 = \beta1 * X1\_1 + \beta2 * X1\_2 + \beta3 * X1\_3 + \varepsilon\_x1$; $X2 = \gamma1 * X2\_1 + \gamma2 * X2\_2 + \varepsilon\_x2$; $X3 = \delta1 * X3\_1 + \delta2 * X3\_2 + \varepsilon\_x3$; $Y1 = \theta1 * Y1\_1 + \varepsilon\_y1$ and $Y2 = \varphi1 * Y2\_1 + \varepsilon\_y2$. Here, $\beta1, \gamma1, \delta1, \theta1,$ and $\varphi1$ were the factor loadings representing the relationship between indicators and the latent variables. For the structural model, we assumed $Y1 = \lambda1 * X1 + \lambda2 * X2 + \lambda3 * X3 + \varepsilon\_y1$ and $Y2 = \eta1 * X1 + \eta2 * X2 + \eta3 * X3 + \varepsilon\_y2$. Here, $\lambda1, \lambda2, \lambda3, \eta1, \eta2,$ and $\eta3$ were the path coefficients between the latent variables. We collected data on the indicators through a survey as shown in Figure 3. Using SmartPLS, we estimated the path coefficients (such as $\lambda1, \lambda2, \lambda3,$ etc.), which involved calculating the covariance matrix and performing maximum likelihood estimation. Suppose the software output were $\lambda1 = 0.5, \lambda2 = 0.3, \lambda3 = 0.2$ (showing how X1, X2, and X3 affected Y1) and $\eta1 = 0.4, \eta2 = 0.4, \eta3 = 0.2$ (showing how X1, X2, and X3 affected Y2).

Figure 3. Example collected data on the indicators through a survey

Participant	Ass3(X1_1)	Ass5(X1_2)	Emp4(X1_3)	Emp5(X2_1)	Rel3(X2_2)	Rel5 (X3_1)	Res2 (X3_2)	Res3 (Y1_1)	Tang1 (Y2_1)
1	4	3	5	3	4	4	3	5	6
2	3	4	4	4	3	3	4	4	5
3	5	5	4	5	5	5	5	5	7

For Linear Regression, we predict the dependent variables (Y1 - Motivation, Y2 - Athlete Performance) based on the independent variables (X1 - Service Quality, X2 - Communication, X3 - Financial Support). We will conduct two regression analyses: Y1 (Motivation) = β0 + β1 * X1 + β2 * X2 + β3 * X3 + ε and Y2 (Kurash Performance) = β0 + β1 * X1 + β2 * X2 + β3 * X3 + ε, then calculate the means of each variable, mean of X1 (Service Quality), mean of X2 (Communication), mean of X3 (Financial Support), mean of Y1 (Motivation) and mean of Y2 (Performance). Next is calculating the covariances and calculating the regression coefficients.

To strengthen the analysis, we expanded on the interactions among variables. In particular, we discussed how communication and financial support might mediate or moderate the effect of service quality on motivation. Likewise, motivation may act as a mediator between the three independent variables and athlete performance. For instance, high-quality service and strong financial support may not directly enhance performance unless they also positively influence an athlete's motivation. These theoretical interactions were supported by examining indirect effects in the structural model, offering a more comprehensive view of how these constructs function together to influence athletic outcomes.

Results

Assessment of reflective measurement models requires evaluation of the reliability and validity of its items to ensure that the items can describe latent variables appropriately (Ali et al., 2018). It involves assessing the relationship between latent variables and related items through indicators that describe the latent variables. Validity is explained as the degree to which a test measures what should be measured (Ilham & Tomoliyus, 2021). Internal consistency reliability and convergence validity are often assessed using two key coefficients: composite reliability (CR) and average extracted variance (AVE). As mentioned in the previous section, the measurement model used in this study includes five primary constructs along with sixteen indicators. According to (McNeish et al., 2018), in assessing the reliability of a model, the loading of each indicator on the related latent variable must be calculated and compared to the threshold. Output loadings should be > 0.7 for indicator reliability/composite reliability to be accepted (Sarstedt et al., 2023). In this study, the composite reliability values all matched these assumptions and were loaded above 0.70 as the recommended value. The overall output of reliability and validity can be seen in Figure 4.

Figure 4. Output for Construct and Reliability and Validity

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
(X1) Service Quallity	0.900	0.902	0.916	0.499
(X2) Communication	0.871	0.880	0.912	0.722
(X3) Financial Aspect	0.925	0.930	0.939	0.658
(Y1) Communication	0.526	0.814	0.754	0.569
(Y2) Kurash Performance	0.747	0.801	0.840	0.577

According to (Türegün, 2019), if the AVE value is more significant than 0.5, then the indicator/measurement item of the variable can be said to be valid and reliable. In terms of Cronbach's alpha value, the loading value is also above 0.6. The rho_A value is also used to assess the construct's reliability, which must be higher than 0.7 to establish internal consistency. Based on the results we obtained, it is clear that all research variables have a loading value higher than 0.70. Thus, these results indicate that the measurement and calculation models have acceptable reliability.

To assess collinearity statistically, our attention is focused on the variance inflation factor (VIF). As can be seen from Table 1, the conclusion of the VIF in our study is well below the threshold value of 5, which says that collinearity is not a problem (Ndayisenga & Tomoliyus, 2019) If you use tables and figures (Table 1), you should take into account the following indications.

Table 1.

No.	Collin.	Value	No.	Collin.	Value	No.	Collin.	Value
1	Ass3	2.008	11	LA1	1.979	21	TC3	1.917

2	Ass5	1.705	12	LA2	1.884	22	TF1	2.074
3	EF3	3.520	13	LA4	2.048	23	TF2	2.228
4	EM2	2.019	14	PE2	2.937	24	TF4	4.175
5	Emp4	2.701	15	PE3	2.678	25	TF5	3.283
6	Emp5	2.763	16	Rel3	1.867	26	TQ3	1.630
7	FE2	1.774	17	Rel5	2.172	27	Tang1	2.205
8	FE3	1.947	18	Res2	1.825	28	Tang3	2.113
9	IM1	1.033	19	Res3	1.965	29	Tang4	1.775
10	IM4	1.989	20	TC1	1.919	30	Wil3	1.199

Discriminant validity between variables is also one of the important things in this study. In Prof. Dipak C. Jain's book, entitled "Mastering Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS in 38 Hours", there are two paths to check discriminant validity: Fornell-Larcker Criterion and HTMT (Wong, 2019). Fornell and Larcker proposed a classical approach stating that the square root of AVE in each latent variable can be used to set the discriminant validity if this value is greater than the other correlation values among the latent constructs (Fornell & Larcker, 1981). To do this, a table is created where the square root of AVE is calculated manually and written in bold on the diagonal of the table. For example, the AVE of the latent variable of the performance of the Kurash athlete was found to be 0.557, so the square root of the same variable (athlete's performance) became 1.438. Similar observations were also made for the latent variables of financial support, motivation, communication, and service quality. The results of discriminant validity among variables can be seen in Figure 5. It indicates that discriminant validity is well-established among the research variables.

Figure 5. Discriminant Validity among Variables.

	(X1) Service Quallity	(X2) Communication	(X3) Financial Aspect	(Y1) Motivation	(Y2) Kurash Performance
(X1) Service Quallity					
(X2) Communication	0.909				
(X3) Financial Aspect	0.927	0.935			
(Y1) Motivation	0.652	0.449	0.567		
(Y2) Kurash Performance	0.567	0.351	0.474	1.438	

The linear regression analysis revealed that most relationships between the independent variables (service quality, financial support, and communication) and the dependent variables (motivation and athlete performance) were not statistically significant, indicating generally weak direct associations. However, some specific paths did show statistical significance ($p < 0.05$), suggesting that under certain conditions, these variables can meaningfully influence one another. This highlights the possibility of indirect or mediated relationships, such as motivation acting as a mediator between external factors and athlete performance. The results of our analysis are presented in Figure 5. It can be seen that the data highlighted in red showed where strong relationships were found, and vice versa. So, to simplify the data above, we look at the column that mentions the p-value to see if the calculated relationship between the independent and dependent variables is statistically significant or not. The theory posits that a relationship is statistically significant if the p-count is less than p-value. Thus, in this study, the data showed that most of the results were not statistically significant. This indicates a weak relationship between the variables within the combinations of indicators and between the variables themselves. For data whose results contain a strong relationship based on p-value < 0.05, it shows that the highest significant value is 0.050 and the lowest is 0.000.

In regression analysis, we often examine whether the relationship between variables is statistically significant using the p-value. The p-value is a number between 0 and 1 that helps determine the strength of the evidence against the null hypothesis (which typically states that there is no effect or no relationship). A smaller p-value (typically less than 0.05) indicates strong evidence that there is a statistically significant relationship between the variables being tested.

The term "p-count", as used in the text, refers to the actual p-value calculated from the data. In practice, this is the same as the "p-value"; the distinction is unnecessary and may confuse readers. Therefore, it is clearer to consistently use the term "p-value" throughout. A simple rule of thumb: If the p-value < 0.05, the result is considered statistically significant — suggesting that there is a meaningful relationship

between the independent and dependent variables. If the p-value ≥ 0.05, the result is not statistically significant — indicating that the observed relationship may be due to chance.

For instance, in this study, the highest significant value was 0.050, and the lowest was 0.000, which means that only some variable pairs showed significant relationships, while most did not. This suggests that the direct relationships between variables such as service quality, communication, and financial support with athlete performance may be weak or indirect. Thus, these statistical indicators highlight the need to explore mediating variables—like motivation—to better understand how these external factors might ultimately influence performance outcomes. However, it is important to note that for some data points, where the p-value was less than 0.05, a statistically significant relationship was found. This means that, while the majority of the variables did not show a direct impact, certain combinations of these factors had a significant effect on the outcomes of interest. The highest significant p-value was 0.050, and the lowest was 0.000, indicating that, although most effects were weak, there were still some critical areas where the relationships were strong enough to influence the dependent variables. The lack of consistent statistical significance in some of the expected relationships suggests that further exploration into the indirect effects of variables is necessary. For example, it may be that the relationship between service quality and athlete performance is not direct but is mediated by motivation. This could mean that high-quality service and financial support may not immediately improve performance unless they also enhance the motivation of the athletes.

Figure 6. Number of visibility and gender firstness in PE Textbooks from Grade 2.

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
(X1) Service Quallity -> (Y1) Motivation	0.754	0.777	0.207	3.644	0.000
(X1) Service Quallity -> (Y2) Kurash Performance	0.007	0.028	0.104	0.068	0.946
(X2) Communication -> (Y1) Motivation	-0.382	-0.404	0.195	1.959	0.050
(X2) Communication -> (Y2) Kurash Performance	-0.054	-0.062	0.069	0.784	0.433
(X3) Financial Aspect -> (X1) Service Quallity	0.848	0.844	0.044	19.126	0.000
(X3) Financial Aspect -> (X2) Communication	0.842	0.839	0.047	18.049	0.000
(X3) Financial Aspect -> (Y1) Motivation	0.027	0.003	0.351	0.078	0.938
(X3) Financial Aspect -> (Y2) Kurash Performance	0.109	0.068	0.126	0.864	0.387
(Y1) Motivation -> (Y2) Kurash Performance	0.885	0.884	0.037	23.899	0.000

Coaches, athletes, parents of athletes, and policymakers need to improve the relationship between service quality, communication, and financial aspects so that motivation can improve athlete performance. The primary purpose of the data above is to look for correlations between indicators and constructs and variables that exist between them. Then, the regression analysis allows us to see if the independent variables predict the values of the dependent variable .

The statistical findings, such as high reliability values (CR, AVE), low VIF, and strong discriminant validity, indicate that the measurement model is valid and reliable. However, the weak relationships between the independent variables and kurash performance, combined with significant results only in a few cases, suggest that motivation plays a central role in mediating the effect of service quality, communication, and financial support on performance. Further exploration into these interactions will be necessary to better understand how to leverage these factors for improved athletic outcomes.

Discussion

This study extends our previous research (Abdhi et al., 2024) by examining the impact of service quality, communication, and financial support on the motivation and performance of Kurash athletes. Unlike the previous study, this research explicitly investigates the role of communication and financial support as predictors of athlete performance through motivation. Since this study was conducted on athletes with various variables, this study is expected to contribute to the literature review. In addition, (Nugroho et al., 2021), (Nachucho et al., 2023),(Cuesta-Valiño et al., 2023), (Nugroho et al., 2023) report the results of their analysis based on the average, it was seen that the quality of service had a significant influence on athlete motivation. The regression analysis showed statistical significance only in selected relationships—such as between financial support and communication, service quality and athlete performance, and service quality and financial support—but not directly between communication or financial support

and performance. These nuanced findings suggest a more complex pathway for performance enhancement. The mediating role of motivation implies that improvements in service or support must also enhance motivation to translate into performance gains. This aligns with Deci & Ryan's Self-Determination Theory, which emphasizes that motivation acts as a key driver for sustained engagement and performance in sports (Deci & Ryan, 2000). Providing quality services and financial support may fulfill athletes' basic psychological needs (autonomy, competence, and relatedness), leading to enhanced intrinsic motivation and, ultimately, better performance.

The results from the sample data, structural equation modeling (SEM), and linear regression analysis demonstrate significant relationships between several dependent and independent variables. However, the correlations between certain indicators and variables, or between variables themselves, were not all significant. Some of these non-significant correlations are presented in Table 4, where the p-values were greater than 0.05. When examining the relationship between financial support (including additional food, allowances, and transportation costs) and athlete satisfaction and performance, the results indicated a relationship, albeit a weak one. These findings align with previous research by Siekańska (Siekańska, 2012), which explored the influence of parental support on athletic performance. Supported by one-way ANOVA, their findings suggested that "the family environment is perhaps the most accessible and crucial dimension of the social-environmental context for young athletes."

For the first variable, service quality, which is measured by five indicators (tangibility, empathy, reliability, responsiveness, and assurance), higher service quality is associated with better scores on each of these indicators. The analysis using SmartPLS confirmed this statement, as all outer loadings exceeded 0.5, with the highest value being 0.932 and the lowest being 0.593. These findings support the hypothesis that a higher level of service quality is reflected in higher scores for its constituent indicators. Similarly, the variable of communication, measured by three indicators (instructional, constructive feedback, and tactical), demonstrated strong correlations between the variable and its indicators. The loading values ranged from a low of 0.714 to a high of 0.808. Furthermore, financial support, measured by indicators such as additional meals, transportation costs, and allowances, also showed strong correlations with its constituent indicators, with loading values ranging from 0.725 to 0.904. A particularly interesting finding was the strong correlation between parental involvement and Kurash athletes' performance. This aligns with previous research highlighting the crucial role of family support in the development of young athletes.

It is expected that the quality of service provided to athletes will obtain a higher loading value if it is correlated with motivation, athlete performance, financial support, or communication. However, this hypothesis was only partially confirmed when most of the loading values were below 0.05, except for the relationship between service quality and communication, which was 0.678. The results of this hypothesis testing are related to whether there is a positive correlation between the dependent and independent variables. As declared in the previous section, the statistical calculation of linear regression proves that there is a significant value between several dependent and independent variables, as well as the significance of the correlation of several indicators with dependent and independent variables. In detail, the significant linear regression value at p-value 0.05 was 0.00 between financial support for athlete communication, 0.003 for athlete motivation and performance, 0.002 for service quality and athlete performance, 0.000 for service quality and financial support, 0.062 for service quality and motivation, 0.00 for service quality and finance. However, linear regression was not found to be significant with a p-value> 0.05 on the following variables; not significant such as between financial support and athlete performance (0.617 > 0.06), financial support and motivation (0.28 > 0.06), motivation and communication (0.292 > 0.06), communication and athlete performance (0.564 > 0.06), service quality and motivation (0.063 > 0.06), communication and athlete performance (0.676 > 0.06), communication and financial aspects (0.678 > 0.06), and finally between communication and finance (0.147 > 0.06).

In the same vein, family support satisfaction was also found to be significant, with (P = 0.043) and other athletic coaches (P = 0.011) being significant predictors of perceived stress. In the influence of communication on athlete performance, the relationship between coach behavior and attribution dimensions such as athlete attribution style was found (Ilham & Dimyati, 2021).

The findings above are the results of hypothesis testing related to whether there is a positive correlation between the dependent and independent variables and points that need to be improved. Conversely, some literature found strong linear regression among these variables in this study, although the

researchers did not provide a rational reason why the data had such features. For example, (Crutcher et al., 2018) with the topic "Examining the Relationship between Social Support Satisfaction and Perceived Stress and Depression in Athletic Training Students" with the main objective of determining the most prominent and ascertaining whether social support satisfaction can predict stress and depression among athletic training students, perceived stress was found to be (P = 0.010) and depression (P = 0.001). Similarly, significant correlations were found between perceived support from family (P = 0.043) and other coaches (P = 0.011) and the level of stress experienced by athletes. These findings align with previous research by (Ilham & Dimyati, 2021) which highlighted the relationship between coaching behaviors and attributional styles among athletes.

The findings of this study carry important implications for various stakeholders involved in the development and performance of Kurash athletes. The nuanced relationships among service quality, communication, financial support, and athlete motivation suggest that performance enhancement requires a multidimensional approach, wherein motivation acts as a crucial mediating factor. For coaches, this calls for a reimagining of their roles. Rather than focusing solely on technical training and tactical execution, coaches should also emphasize motivational coaching strategies. According to (Choi et al., 2020) (Bustamante & Mortejo, 2023), instructional communication must be complemented by emotional and psychological engagement. Implementing individualized motivational feedback, fostering supportive communication, and designing holistic athlete development plans are necessary to nurture both skill and motivation. Athletes, on the other hand, must cultivate greater self-awareness regarding their performance determinants. While external factors such as coaching and support systems are influential, the athlete's internal motivational state plays a decisive role in how these supports translate into outcomes. To optimize performance, athletes should engage in personal goal setting, regular self-reflection, and take advantage of available support services such as nutritional counseling and psychological coaching. Parents and families also play a pivotal role in shaping the athlete's journey. As highlighted by (Gao et al., 2023) and (Crutcher et al., 2018) ,emotional and logistical support from family significantly influences an athlete's stress levels and overall performance. Creating a nurturing and non-pressuring environment and being actively involved in the athlete's development process are essential actions that families can take to sustain motivation and commitment. For policy makers and sports organizations, the implications are clear: investment strategies should extend beyond physical infrastructure and financial incentives to include comprehensive athlete development programs. These should prioritize motivation-enhancing initiatives such as mentorship programs, access to sports psychologists, and structured team-building activities. Moreover, integrating motivational assessment tools, funding psychological training for coaches, and conducting regular well-being checks will ensure a supportive ecosystem for athlete growth. Lastly, researchers and academics are encouraged to delve deeper into the complex interplay between external support systems and athlete performance. This study emphasizes the need to explore indirect and mediated relationships—such as how motivation or stress influences the effectiveness of service quality and communication. Future research should employ larger and more diverse samples and investigate moderating variables like age, gender, athletic experience, or coaching style, utilizing advanced analytical tools such as AMOS, LISREL, and Mplus. In summary, the insights from this research underscore the necessity for a holistic and stakeholder-sensitive approach to enhancing Kurash athlete performance. Each actor in the ecosystem has a role to play in fostering an environment where motivation is prioritized, ultimately leading to sustained athletic success.

Some relationships in this study were not statistically significant due to several influencing factors. First, the complexity of athlete performance suggests that direct effects from service quality, communication, or financial support may be limited unless mediated by psychological factors like motivation. Motivation likely acts as a bridge that converts these external supports into actual performance gains, consistent with Self-Determination Theory. Second, the variation in p-values may reflect contextual or sample-specific factors, such as differences in individual experiences, access to resources, or perceived value of support. Additionally, strong indicator loadings do not guarantee significant outcome relationships if the external factors do not directly align with athletes' internal goals. Hence, weak significance may reflect indirect or moderated relationships rather than measurement flaws. These results imply that enhancing motivation is essential to translating support into improved athlete outcomes. Future models should better account for mediating and moderating influences to capture the full dynamics at play.

Improving service quality, communication, and financial support can significantly impact the long-term development of Kurash sport and the sustainability of training programs. Research shows that better

service quality leads to enhanced athlete satisfaction and performance (Thamnopoulos et al., 2012). Effective communication between coaches, athletes, and stakeholders is essential for fostering a positive environment that promotes growth (Ralph, 2018). Moreover, adequate financial support is crucial for sustaining training facilities, organizing competitions, and ensuring athlete development (Baker & Horton, 2004). These factors combined create a solid foundation for long-term success in sports, as they support not only the immediate performance of athletes but also the broader institutional growth of Kurash as a sport. By addressing these areas, sports organizations can ensure the sustainability and continuous improvement of training programs, leading to greater athlete retention and success on the global stage.

The limitation of this study was the insufficient sample size, which involved only 100 participants. One of the reviewers who evaluated this manuscript argued that a sample of 100 Kurash athletes was not sufficient to obtain fully conclusive results, and this argument was supported by previous researchers (Preobrazenski et al., 2024) (Franchini et al., 2015). While there was limited direct evidence discussing the insufficiency of a 100-athlete sample size in combat sports research, general principles of research methodology suggested that larger sample sizes were necessary to achieve conclusive results, especially when accounting for the diversity and complexity within combat sports disciplines. For future studies, we planned to include larger samples to enhance the generalizability of the findings or expand the sample size in subsequent research. Furthermore, considering that the athlete category was a categorical variable and variables such as service quality and motivation were numerical, SmartPLS 4 was deemed appropriate for this analysis. However, the use of the student version of SmartPLS 4 limited the sample size to only 100 participants. For Kurash sport practice, these findings indicate that while improving service quality, communication, and financial support are essential, these factors alone might not directly lead to improved athlete performance. The results suggest that improving athletes' motivation could be a key mediator in enhancing performance. Coaches, athletes, parents, and policymakers should focus not only on the tangible aspects like funding and facilities but also on psychological and motivational factors to see significant improvements in performance. For future research, these results highlight the need for more in-depth studies into the indirect effects of the independent variables. Researchers could explore how motivation acts as a mediator in the relationship between service quality, financial support, and athlete performance. Additionally, further research could investigate other potential moderating variables that might influence these relationships, such as individual athlete characteristics, environmental factors, or coaching quality. By deepening the understanding of these dynamics, future studies could offer more comprehensive insights into the factors that contribute to athlete success in Kurash and other sports, and we planned to explore other analytical software to address this limitation, such as AMOS, LISREL, Mplus, and Stata, which could handle larger samples and support structural equation modeling (SEM) or regression analysis.

Conclusions

Good service quality, effective communication, and adequate financial support significantly impact the motivation of Kurash athletes in Indonesia, thereby enhancing their performance. In a developing sport like Kurash, these factors become particularly crucial. They attract potential athletes, increase athlete satisfaction, and ensure the sustainability of the sport through youth development and effective management. Athletes who feel valued and supported are more likely to be motivated to achieve higher levels of performance. To further improve service quality, it is recommended to meet athletes' needs, enhance and maintain training facilities, provide health insurance, recruit competent coaches, identify and nurture young talent, and conduct regular evaluations of management practices. For future research, longitudinal studies are suggested to examine the consistency of the model used in this study. Additionally, researchers should delve deeper into athletes' perspectives to gain a more comprehensive understanding of how and why service quality, communication, and financial factors play such a crucial role in motivating athletes to improve their performance.

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