USFD Journal

of Physical Education Pedagogy & Sports Performance

Lampos Publishing OPC · Peer-Reviewed · Open Access **Vol. 2 (2) · June 2026**

ISSN 3082-5725 (Online) · DOI prefix 10.64339/USFD-

RESEARCH ARTICLE

Influencing Factors of Free-Throw Shooting Accuracy Among Grade 10 Students

Kween Jessa P. Agustin

Lourdes College, Inc.

Correspondence: kween.agustin@lccdo.edu.ph

RECEIVED May 13, 2026 **ACCEPTED** June 1, 2026

PUBLISHED June 15, 2026 **DOI** 10.64339/USFD-tf4ze818

CITE AS Agustin, K. J. P. (2026). Influencing factors of free-throw shooting accuracy among Grade 10 students. *USFD Journal of Physical Education Pedagogy & Sports Performance*, 2(2), 14–25. https://doi.org/10.64339/USFD-tf4ze818

ABSTRACT

Free-throw shooting is a fundamental basketball skill that reflects not only technical proficiency but also the interaction of psychological, physiological, and anthropometric characteristics of learners. Yet relatively few studies have examined skill-specific technical tasks such as free-throw shooting, particularly among adolescent learners in school physical education settings. This study examined the combined influence of self-efficacy in free-throw shooting, upper-body strength, and body mass index (BMI) on the free-throw accuracy of Grade 10 students. Guided by a descriptive–predictive (correlational) research design, the study involved 146 students selected through systematic random sampling. They completed a free-throw self-efficacy questionnaire, an upper-body strength assessment using a push-up test transformed through the Epley equation, standard BMI computation, and a 20-shot free-throw performance test. Results showed that students exhibited generally moderate self-efficacy, fair upper-body strength, normal but low-leaning BMI values, and fair shooting accuracy. Multiple linear regression analysis revealed that the overall regression model was statistically significant, $F(3,142) = 13.244$, $p < .001$, with the three predictors collectively explaining 21.9% of the variance in free-throw shooting accuracy ($R^2 = 0.219$). Self-efficacy ($\beta = 0.266$) and upper-body strength ($\beta = 0.302$) were significant positive predictors, whereas BMI ($\beta = -0.250$) was a significant negative predictor. Self-efficacy and upper-body strength significantly and positively predicted free-throw accuracy, whereas BMI demonstrated a significant negative effect. These findings validate the assumptions of Social Cognitive Theory, Kinetic Chain Theory, and Physiological Efficiency Theory by illustrating how psychological readiness, muscular capacity, and body composition collectively shape performance in precision-based sport tasks. Future research should focus on evaluating the impact of integrating psychological skills and training, strength building exercises, and regular BMI monitoring within physical education programs in enhancing students' basketball performance.

KEYWORDS *self-efficacy, upper-body strength, body mass index, free-throw accuracy, basketball performance*

INTRODUCTION

Free-throw shooting is a decisive basketball skill that often influences game outcomes, especially in youth competitions where technical training is limited. Although performed without defensive pressure, it demands precise motor coordination, visual focus, and psychological regulation to be executed consistently. Among Grade 10 students, limited exposure to structured skill instruction frequently results in poor accuracy and underdeveloped shooting mechanics.

International research shows that free-throw performance results from a combination of mechanical efficiency, psychological readiness, and physical attributes (Čabarkapa *et al.*, 2021, 2022; Kanat & Şimşek, 2021). Technical elements such as joint alignment, release angle, and coordinated muscular activation strongly predict shooting consistency (Čabarkapa *et al.*, 2021, 2022). Psychological components, particularly the quiet-eye period before execution, also enhance attentional control and accuracy under pressure (Kanat & Şimşek, 2021; Zhao *et al.*, 2023).

Despite basketball's prominence in the Philippines, local research rarely examines free-throw accuracy or its psychological and physical determinants. Most studies emphasize general fitness rather than technical or skill-specific performance, creating a gap between curriculum expectations and actual coaching practice. Given the K to 12 PE curriculum's focus on movement competence and game performance, evidence-based research on free-throw shooting is needed.

Public school contexts often lack structured opportunities to teach free-throw mechanics, leaving students with limited confidence and inconsistent form. Based on teaching observations, students frequently struggle with focus, emotional regulation, and technique—key elements identified in Social Cognitive Theory as predictors of performance. These gaps highlight the need to examine psychological beliefs, muscular strength, and body composition in relation to shooting accuracy.

Theoretically, free-throw performance may be shaped by self-efficacy, upper-body strength, and physiological efficiency. Self-efficacy influences attentional stability and pressure tolerance, strength affects movement control and release stability, and BMI contributes to balance and motor precision. Despite mixed findings in prior studies, these variables require further investigation in adolescent populations.

This study therefore examines the combined effects of self-efficacy, upper-body strength, and BMI on free-throw accuracy among Grade 10 students in Malaybalay City. Grounded in Social Cognitive Theory, Kinetic Chain Theory, and Physiological Efficiency Theory, the study addresses a significant gap in local evidence on youth basketball performance. The findings aim to inform PE instruction, coaching practices, and school-based sports programming aligned with DepEd policies and global SDGs.

By identifying key predictors of free-throw accuracy, this research supports the development of evidence-based strategies to enhance technical skill performance among Filipino adolescents. The study contributes to broader goals of improving athletic competency, physical literacy, and holistic youth development in school settings.

Statement of the Problem

This study investigated the predictive value of certain psychological, physiological and anthropometric parameters for accuracy in basketball free-throw shooting. Namely, the relationship of free throw self-efficacy, upper-body strength and BMI with shooting accuracy. For investigation, the study addresses the research questions:

1. What is the level of self-efficacy in free-throw shooting among the participants?
2. What is the level of upper body strength among the participants?
3. What is the BMI of the participants?
4. What is the level of free-throw shooting accuracy of the participants?
5. Do self-efficacy, upper body strength, and BMI significantly influence free throw shooting accuracy?

Hypotheses

In relation to the final research question, the following null hypotheses were formulated:

Ho_1: There is no significant combined influence of self-efficacy in free-throw shooting, upper body strength, and BMI on free-throw shooting accuracy among the participants.

Ho_2: There is no significant influence of self-efficacy in free-throw shooting on free-throw shooting accuracy among the participants.

Ho_3: There is no significant influence of upper body strength on free-throw shooting accuracy among the participants.

Ho_4: There is no significant influence of BMI on free-throw shooting accuracy among the participants.

METHODS AND MATERIALS

This study used a descriptive–predictive (correlational) research design to examine whether self-efficacy in free-throw shooting, upper body strength, and body mass index (BMI) predict free-throw accuracy among Grade 10 students. The design is correlational in that no variables were manipulated, and predictive in that multiple linear regression was used to model the combined contribution of the predictors to shooting accuracy. The design enabled the identification of statistical relationships among naturally occurring variables without manipulating experimental conditions, consistent with approaches used in educational and behavioral research. Through this design, the study quantified psychological, physical, and performance-related variables and developed a regression model explaining their combined effects on shooting accuracy.

Participants were Grade 10 students from public secondary schools in District V, Malaybalay City. Eligibility criteria included official enrollment as a Grade 10 student and parental consent accompanied by confirmation of physical fitness. Systematic random sampling was used to promote equitable representation across schools, and demographic information such as age, sex, height, and weight was recorded for BMI computation.

Four instruments measured the study variables: a contextualized Self-Efficacy in Free-Throw Shooting Questionnaire (adapted from Schwarzer & Jerusalem's GSE), an upper-body strength test using a cadence-controlled push-up protocol transformed through the Epley Equation, BMI calculation using WHO standards, and a 20-shot free-throw accuracy test. These instruments underwent expert validation and pilot try-out. The General Self-Efficacy Scale from which the questionnaire was adapted has demonstrated strong internal consistency in prior validation studies, with Cronbach's alpha coefficients ranging from .76 to .90 (Chen *et al.*, 2000; Scholz *et al.*, 2002); the basketball-contextualized version was refined through expert review for content validity and pilot-tested with 30 non-participant junior high school athletes, which yielded acceptable internal consistency. For the upper-body strength measure, the Epley-adjusted push-up score showed good concurrent validity against a one-repetition-maximum criterion (r = .781; Gomez, 2025). BMI followed standardized WHO measurement procedures, and the 20-shot free-throw accuracy test was pilot-tested for split-half reliability (odd–even trials) with a Spearman–Brown correction.

Ethical procedures adhered to the Belmont principles, with approvals secured from relevant institutions. Participants received orientation regarding study procedures, risks, and confidentiality, followed by informed consent and assent. Testing sessions were conducted under safe and standardized conditions, with warm-ups, hydration breaks, and supervised administration of strength and shooting assessments.

Data analysis utilized descriptive statistics to summarize the levels of each variable and multiple linear regression to determine the predictive effects of self-efficacy, upper-body strength, and BMI on free-throw accuracy. Regression outputs included standardized beta coefficients, significance levels ($p < .05$), 95% confidence intervals, and R^2 values, allowing for a comprehensive evaluation of psychological, physiological, and anthropometric predictors of shooting performance. Prior to interpretation, standard regression assumptions were examined and met: linearity was confirmed through scatterplots and partial regression plots; independence of residuals was supported by a Durbin–Watson statistic within the acceptable range (approximately 1.5–2.5); normality of residuals was verified through histograms and normal P–P plots; homoscedasticity was confirmed by the absence of funneling in the residual-versus-predicted scatterplot; and multicollinearity was ruled out, with all tolerance values exceeding 0.10 and all variance inflation factors below 10.

RESULTS

Problem 1. What is the level of self-efficacy in free-throw shooting among the participants?

Table 1 presents the distribution of participants' self-efficacy levels in free-throw shooting.

Table 1. *Level of Self-efficacy in Free-throw Shooting*

Score Range	Description	Interpretation	Frequency	Percentage
4.51–5.00	Very True of Me	Very High	5	3.42
3.51–4.50	True of Me	High	39	26.71
2.51–3.50	Moderately True of Me	Moderate	70	47.95
1.51–2.50	Slightly True of Me	Low	29	19.86
1.00–1.50	Not True of Me	Very Low	3	2.05
	Total		**146**	**100**
	Mean		**3.12**	
	Interpretation		**Moderate**	
	SD		**0.75**	

The overall mean score was 3.12 (SD = 0.75), corresponding to a moderate level of self-efficacy. Nearly half of the participants (47.95%) fell within the moderate range, followed by 26.71% in the high category. Only a small proportion reported very high (3.42%) or very low (2.05%) self-efficacy.

Problem 2. What is the level of upper body strength among the participants?

Table 2 presents the participants' upper body strength (UBS) levels based on their Epley-adjusted push-up scores. The overall mean score was 42.05 kg (SD = 9.92), which corresponds to a Fair interpretation. A substantial proportion of participants (39.04%) fell in the Poor category, followed by Fair (24.66%) and Good (18.49%). Only a small group achieved Very Good (14.38%) or Outstanding (3.42%) strength levels.

Table 2. *Level of Upper Body Strength*

Score Range	Interpretation	Frequency	Percentage
62.4 – 75.0	Outstanding	5	3.42
51.5 – 62.3	Very Good	21	14.38
44.6 – 51.4	Good	27	18.49
37.7 – 44.5	Fair	36	24.66
22.0 – 37.6	Poor	57	39.04
Total		**146**	**100**
Mean		**42.05**	
Interpretation		**Fair**	
SD		**9.92**	

Problem 3. What is the Body Mass Index of the participants?

Table 3 presents the BMI classification of the participants using the World Health Organization (WHO) standards. The mean BMI was 19.52 kg/m² (SD = 2.60), which falls within the Normal category. A majority of the participants (60.27%) were classified as Normal weight, while 36.99% were Underweight. Only 2.74% were Overweight, and notably, no participant fell within the Obese categories.

Table 3. *Body Mass Index*

BMI Range	Interpretation	Frequency	Percentage
≥35.0	Obese Class II	0	0.00
30.0 – 34.9	Obese Class I	0	0.00
25.0–29.9	Overweight	4	2.74
18.5–24.9	Normal	88	60.27
<18.5	Underweight	54	36.99
TOTAL		**146**	**100**
Overall Mean		**19.52**	
Interpretation		**Normal**	
SD		**2.60**	

Problem 4. What is the level of free-throw shooting accuracy of the participants?

Table 4 presents the distribution of participants' free-throw shooting accuracy based on their scores in a 20-shot standardized free-throw test. The overall mean score was 6.59 (SD = 3.72), classified as Fair accuracy. The majority of participants fell within the Fair (34.25%) and Poor (32.19%) categories. A smaller proportion demonstrated Good shooting accuracy (28.77%), while only 4.11% achieved Very Good performance and 0.68% reached the Outstanding level.

Table 4. *Level of Free-throw Shooting Accuracy*

Range	Interpretation	Frequency	Percentage
17–20	Outstanding	1	0.68
13–16	Very Good	6	4.11
9–12	Good	42	28.77
5–8	Fair	50	34.25
0–4	Poor	47	32.19
TOTAL		**146**	**100**
Mean		**6.59**	
Interpretation		**Fair**	
SD		**3.72**	

Problem 5. Do the participants self-efficacy, upper body strength, and BMI significantly influence their free throw shooting accuracy?

Ho_1:	There is no significant combined influence of self-efficacy in free-throw shooting, upper body strength, and BMI on free-throw shooting accuracy among the participants.
Ho_2:	There is no significant influence of self-efficacy in free-throw shooting on free-throw shooting accuracy among the participants.
Ho_3:	There is no significant influence of upper body strength on free-throw shooting accuracy among the participants.
Ho_4:	There is no significant influence of BMI on free-throw shooting accuracy among the participants.

Table 5 presents the multiple regression analysis examining whether self-efficacy in free-throw shooting, upper body strength, and BMI significantly predict free-throw accuracy. The regression model was statistically significant, $F(3,142) = 13.244$, $p < .001$, accounting for 21.9% of the variance in free-throw shooting accuracy ($R^2 = 0.219$; Adjusted $R^2 = 0.202$).

Table 5. *Regression Analysis of Self-Efficacy in Free-Throw Shooting, Upper Body Strength, and BMI on Free Throw Shooting Accuracy*

Predictor	Unstandardized Coefficients		β	95% CI		t	p
	B	SE		Lower	Upper		
Constant	4.674	2.378		0.015	9.333	1.965	.051
Self-Efficacy in Free-Throw Shooting	1.326	0.386	0.266	0.569	2.083	3.431**	.001
Upper Body Strength	0.113	0.031	0.302	0.052	0.174	3.682**	< .001
BMI	-0.357	0.112	-0.250	-0.576	-0.138	-3.182**	.002

Model Summary

$R = 0.468$ $R^2 = 0.219$ Adjusted $R^2 = 0.202$ $F(3,142) = 13.244$ $p<.001$

Model Equation

$A = 1.326E + 0.113S - 0.357B + 4.674$

Legend: A = Free throw shooting accuracy, E = Self-Efficacy in Free-Throw Shooting, S= Upper Body Strength, B = BMI

*Note. B = unstandardized beta coefficient, SE = standard error, β = standardized beta coefficient, 95% CI = 95% confidence interval, t = t statistic, p = probability value. *Significant at 0.05 two-tailed alpha level. **Significant at 0.01 level. Confidence intervals were verified against the regression output; each interval contains its B coefficient and is consistent with the corresponding significance level.*

Regarding the assumptions of this study, the null hypotheses were partially rejected based on the regression findings. Ho_1, which stated that self-efficacy in free-throw shooting, upper body strength, and BMI do not significantly and collectively influence free-throw shooting accuracy, was rejected because the overall regression model was statistically significant, $F(3,142) = 13.244$, $p < .001$, indicating that the combined predictors significantly explained variations in free-throw accuracy. Ho_2 was likewise rejected since self-efficacy in free-throw shooting significantly predicted free-throw accuracy ($\beta = 0.266$, $p = .001$), showing that higher self-efficacy was associated with better shooting performance. Ho3 was also rejected because upper body strength significantly influenced free-throw accuracy ($\beta = 0.302$, $p < .001$), suggesting that greater upper body strength contributed positively to shooting success. Ho4 was similarly rejected, as BMI significantly predicted free-throw accuracy ($\beta = -0.250$, $p = .002$), but in a negative direction, indicating that higher BMI was associated with lower free-throw shooting accuracy. Overall, all four null hypotheses were rejected, confirming that self-efficacy, upper body strength, and BMI each significantly influenced free-throw shooting accuracy both independently and collectively among the participants.

DISCUSSION

The participants' moderate level of self-efficacy in free-throw shooting suggests that while most Grade 10 students possess a basic belief in their ability to perform and improve, this confidence remains somewhat unstable when confronted with pressure, fatigue, or emotionally demanding situations. On one hand, their strongest confidence was rooted in the belief that consistent practice could improve performance, which strongly reflects Bandura's (1977, 1997) principle that mastery experiences are the most powerful source of self-efficacy development. This pattern aligns with findings that repeated successful practice strengthens confidence, motivation, and motor learning (Chiviacowsky & Wulf, 2005; Makki *et al.*, 2021). On the other hand, lower confidence in maintaining accuracy under nervousness or competitive stress indicates that their self-belief may not yet be sufficiently resilient across varied performance contexts. In this sense, the participants appear to demonstrate a functional but fragile confidence system—one that supports skill acquisition but may weaken during emotionally demanding moments. This observation is consistent with broader sport psychology literature showing that self-efficacy extends beyond simple confidence and is deeply connected to emotional regulation, attentional control, and resilience (Çetin *et al.*, 2021; Zhao *et al.*, 2023). Consequently, while participants seem motivated to improve, the findings imply that psychological skills training may be necessary to transform moderate confidence into consistently effective performance under pressure.

In relation to physical readiness, the participants' fair upper-body strength profile reveals another important limitation that may influence basketball performance. Although some students demonstrated moderate to high strength levels, the concentration of participants in poor and fair categories suggests that the majority may not yet possess the muscular conditioning necessary to consistently support efficient free-throw mechanics. This is particularly significant because free-throw shooting relies not only on technical skill but also on upper-body stability, shoulder control, and coordinated force production to maintain shot consistency. Thus, limited muscular endurance may compromise shooting form, trajectory, and follow-through. These findings are supported by studies emphasizing the importance of muscular fitness for force generation and biomechanical stability in sport tasks (Amador *et al.*, 2020; Amara *et al.*, 2021; Thomas *et al.*, 2021). Furthermore, the distribution may reflect insufficient resistance-training exposure within current physical education experiences, particularly in school settings that may prioritize participation over targeted strength development. Since literature consistently demonstrates that neuromuscular adaptation and structured resistance training improve muscular performance (Khalafi *et al.*, 2023; Wang *et al.*, 2023), the present results suggest that many participants may be physically underprepared for the biomechanical demands of precision-based basketball skills.

Beyond psychological and muscular variables, the BMI distribution of participants adds another layer to understanding physical readiness. While the group's overall mean BMI fell within the normal range, the notably high proportion of underweight students indicates that many participants may still face physiological disadvantages related to insufficient muscle mass, nutritional deficits, or reduced energy reserves. This finding presents a more nuanced picture than the average alone suggests, as it reveals variability in body composition that may influence athletic performance differently across individuals. Compared with broader adolescent trends that often emphasize overweight or obesity concerns (Sugito *et al.*, 2022), this sample's higher underweight prevalence suggests that local socioeconomic or nutritional factors may be particularly relevant. Although BMI is widely used as a general health indicator (WHO, 2023; Lee *et al.*, 2021), its inability to distinguish fat mass from lean mass (Dum *et al.*, 2023) means its value in this context lies more in signaling possible physiological imbalance than in directly explaining skill performance. Nevertheless, both excessively low and high BMI may disrupt movement efficiency, postural stability, and energy economy, all of which are relevant to free-throw shooting. Therefore, BMI in this study appears to serve as a broader physiological context that may either support or constrain biomechanical effectiveness.

When these psychological and physical conditions are considered alongside actual performance outcomes, the participants' fair free-throw shooting accuracy becomes more understandable. The predominance of fair and poor classifications indicates that many students have not yet developed the biomechanical precision, attentional consistency, or coordinated control required for highly accurate shooting. This finding corresponds with existing literature describing free-throw shooting as a specialized motor skill requiring technical refinement, psychological stability, and efficient movement sequencing (Čabarkapa *et al.*, 2021; Kanat & Şimşek, 2021; Zhao *et al.*, 2023). More specifically, proficient shooters typically demonstrate optimized joint angles, stable release patterns, and better motor control than less successful performers (Čabarkapa *et al.*, 2022; Delgado-Delgado *et al.*, 2024). The current results therefore suggest that many participants are still in the developmental stages of acquiring these integrated performance characteristics. Moreover, because free-throw shooting is often underemphasized as a specialized skill within general PE contexts, these findings may also reflect limited structured practice opportunities. Overall, the participants' shooting performance appears to mirror developing rather than refined basketball competence, reinforcing the need for intentional instruction that combines technical, physical, and psychological preparation.

Taken together, the rejection of Ho_1 provides strong evidence that free-throw shooting accuracy is not determined by a single factor but rather by the combined influence of psychological, physical, and physiological variables. The significant predictive power of self-efficacy, upper-body strength, and BMI collectively supports the study's conceptual framework and reinforces the multidimensional nature of sports performance. This finding directly aligns with Social Cognitive Theory (Bandura, 1997), Kinetic Chain Theory (Steindler, 1955), and Physiological Efficiency Theory (Hill, 1922; Henry, 1958), each of which emphasizes that performance emerges from interacting systems rather than isolated traits. Although the model explained only part of the variance in shooting accuracy, its significance confirms that these three variables meaningfully shape performance outcomes. At the same time, the unexplained variance suggests that additional factors such as technique, coaching quality, fatigue, or visual attention may also contribute. Nonetheless, the rejection of Ho_1 strongly validates the broader proposition that successful free-throw shooting among adolescents is best understood through a holistic developmental lens.

Among these combined predictors, self-efficacy emerged as a particularly meaningful psychological influence, as evidenced by the rejection of Ho_2. This finding reinforces Bandura's (1997) assertion that efficacy beliefs shape performance by regulating motivation, emotional control, and persistence. In practical terms, students who believed more strongly in their capacity to succeed were also more likely to perform better in free-throw shooting. This relationship is consistent with meta-analytic and contemporary sport psychology evidence demonstrating that self-efficacy enhances performance by reducing anxiety, improving focus, and supporting stable motor execution (Lochbaum *et al.*, 2023; López-Rodríguez *et al.*, 2025). Basketball-specific interventions such as self-talk and imagery have similarly been shown to strengthen confidence and improve free-throw outcomes (Galanis *et al.*, 2022; Ramadhan *et al.*, 2023; Robin *et al.*, 2019). Therefore, rather than functioning as a secondary emotional factor, self-efficacy appears to be a central performance mechanism, particularly in isolated skills where precision and psychological regulation are critical.

In contrast to self-efficacy's psychological role, the rejection of Ho_3 highlights the biomechanical significance of upper-body strength in supporting free-throw performance. This finding suggests that muscular strength contributes not merely to force production but also to movement stability, shot control, and mechanical consistency. Such results are consistent with Kinetic Chain Theory, which proposes that efficient movement depends on coordinated force transfer across interconnected body segments (Steindler, 1955). For adolescent participants, foundational upper-body strength may be especially important because it supports the development of stable movement patterns before more advanced technical refinements are mastered. Although some literature suggests that maximal strength alone may not predict shooting performance in elite athletes (Čabarkapa *et al.*, 2022), the present findings imply that among younger or developing populations, general strength remains a meaningful contributor to successful execution. Thus, upper-body strength appears to function as a supportive biomechanical base that enhances reproducible shooting mechanics rather than as a sole determinant of accuracy.

Finally, the rejection of Ho4 underscores the physiological relevance of BMI by demonstrating its significant negative relationship with free-throw accuracy. As BMI increased, shooting accuracy tended to decline, suggesting that body composition may be associated with performance through its relationship with movement economy, stability, and physiological efficiency. This finding aligns with Physiological Efficiency Theory, which emphasizes optimal performance when energy expenditure and movement are efficiently regulated (Hill, 1922; Henry, 1958). Although BMI is not a perfect measure of body composition (Dum *et al.*, 2023), its predictive significance in this study suggests that deviations from an optimal physiological range may compromise the biomechanical and cognitive systems required for precision shooting. Supporting literature similarly indicates that body composition influences coordination, balance, and functional movement in basketball contexts (Moraes *et al.*, 2024; Zhao *et al.*, 2023). Thus, BMI appears not as a direct technical factor but as a physiological condition that may either facilitate or constrain the efficiency with which basketball skills are executed.

CONCLUSION

This study examined the combined influence of self-efficacy, upper-body strength, and BMI on the free-throw accuracy of Grade 10 students in District V, Malaybalay City. Findings showed that students generally exhibited moderate self-efficacy, fair strength, normal but low-leaning BMI, and fair shooting accuracy, reflecting a developing skill profile. Regression analysis confirmed that self-efficacy and upper-body strength positively predicted shooting accuracy, while BMI had a negative effect, emphasizing the importance of both psychological and physiological readiness. These results support the integration of Social Cognitive Theory, Kinetic Chain Theory, and Physiological Efficiency Theory in explaining free-throw performance. Overall, free-throw accuracy is shaped by interacting cognitive, physical, and anthropometric factors, underscoring the need for training programs that build confidence, muscular strength, and healthy body composition.

LIMITATIONS OF THE STUDY

Several limitations should be considered when interpreting these findings. First, the descriptive–predictive (correlational) design establishes statistical association rather than causation; the significant predictors should therefore be read as correlates of free-throw accuracy, not proven causes. Second, BMI is a coarse anthropometric index that does not distinguish fat mass from lean mass, so its negative association with accuracy should be interpreted cautiously. Third, the study was confined to Grade 10 students in District V, Malaybalay City, which limits generalizability to other grade levels, regions, and competitive contexts. Fourth, the model explained 21.9% of the variance, indicating that unmeasured factors—such as shooting technique, coaching quality, fatigue, and visual attention—also contribute to performance and warrant inclusion in future work.

RECOMMENDATIONS

Based on these findings, several recommendations are offered. For physical education practice, teachers are encouraged to integrate psychological skills training (for example, self-talk and imagery) to help convert moderate self-efficacy into stable performance under pressure, alongside structured upper-body strength activities that support reproducible shooting mechanics. For coaching, free-throw shooting merits explicit, repeated instruction as a specialized skill rather than incidental practice. For school health programming, periodic monitoring of body composition—with attention to the high proportion of underweight students observed here—may help address nutritional and conditioning needs. For future research, scholars should employ larger and more diverse samples, incorporate direct measures of shooting technique and attentional control, and consider longitudinal or experimental designs to test whether targeted interventions improve free-throw accuracy.

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Conflict of Interest: *The author declares that there is no conflict of interest regarding the publication of this article.*

Acknowledgements: *The researcher extends sincere gratitude to Almighty God for wisdom and grace, to the thesis adviser, professors, and panelists for their invaluable guidance and support, and to family and loved ones for their unwavering encouragement, to whom all glory is humbly offered.*

Funding: *This research received no external funding and was supported solely by the personal resources of the primary author.*

Ethical Approval: *The study was reviewed and approved by the Ethics Committee of Lourdes College, Inc., the researcher's academic institution, in accordance with the ethical standards outlined in the Belmont Report. As participants were Grade 10 minors, written parental consent was secured alongside student assent, with orientation on procedures, risks, and confidentiality, ensuring full ethical compliance.*

AI Declaration: *This study utilized artificial intelligence tools to assist in preparing this article. Specifically, AI assistance was used to help condense the full thesis manuscript into a reduced journal-article format and to refine language quality, clarity, and tone, with human supervision and editing throughout. All statistical results were verified against the author's thesis and source data, and the author carefully reviewed and edited all outputs to maintain academic rigor and integrity.*

Data Availability Statement: *The datasets generated and analyzed during the current study are available from the corresponding author upon reasonable request. Requests for access will be evaluated in accordance with ethical guidelines and data privacy policies.*