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Training Engagement Intensity and Prosocial Character Among Young Taekwondo Participants

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ABSTRACT

The increasing complexity of children's psychosocial development in the digital era has intensified concerns regarding discipline, self-control, and prosocial behavior among young individuals. This study aimed to examine the statistical association between taekwondo training engagement intensity and children's prosocial character among members of Dojang Golden Eagle. The study employed a quantitative cross-sectional correlational design involving 50 child and adolescent taekwondo participants selected using a total sampling approach. Data were collected through structured self-report questionnaires measuring training engagement intensity and children's character dimensions, including discipline, responsibility, self-control, social respect, and self-confidence. Construct validity was evaluated using Exploratory Factor Analysis, while reliability was assessed using Cronbach's Alpha coefficients. Multiple regression analysis was conducted after assumption testing procedures were satisfied. The findings indicated that training engagement intensity was positively and significantly associated with children's character scores after controlling for demographic variables ($\beta = .682$, $p = .001$). The regression model explained 43.2% of the variance in character outcomes. The findings suggest that consistent participation in structured taekwondo training environments may be associated with stronger prosocial self-regulatory characteristics among children. Nevertheless, causal interpretations should be made cautiously due to the cross-sectional nature of the study.

1. INTRODUCTION

Social changes in the digital era have created new challenges for the psychosocial development of children and adolescents. The increasing intensity of digital media use, shifting patterns of social interaction, and growing exposure to virtual environments have substantially influenced how children develop behavioral regulation, emotional control, and interpersonal relationships. Several studies have indicated that contemporary social environments are associated with higher levels of impulsive behavior, weakened self-control, declining prosocial tendencies, and increased externalizing behaviors among children and adolescents (Baeti et al., 2026; Musonif, et al., 2026; Petropoulou et al., 2025; Wu et al., 2025). In the context of child development, character is no longer narrowly understood as a set of normative moral values, but rather as a multidimensional psychosocial construct reflecting an individual's capacity to regulate behavior, internalize social norms, and display adaptive responses across diverse social situations (Azis et al., 2026; Fahrezi et al., 2026; Musonif, et al., 2026; Weinberg & Gould, 2019). From this perspective, character encompasses dimensions such as discipline, responsibility, respect for others, self-control, and self-confidence, all of which develop through repeated and consistent processes of

social learning. Character development in children is a complex process shaped by interactions among family influences, school environments, peer relationships, and structured social experiences. Consequently, contemporary approaches to character education no longer rely solely on the verbal transmission of moral values, but increasingly emphasize the importance of experiential learning contexts that allow children to practice behavioral regulation in everyday life. In recent years, sports participation has received growing scholarly attention as a nonformal educational context capable of fostering psychosocial competencies and character development in children and adolescents. Sports are no longer viewed merely as physical fitness activities, but also as social learning environments through which individuals develop self-regulation, discipline, cooperation, and social adaptability through repeated participatory experiences (Maharani & Musonif, 2026; Tang et al., 2025; Zhou et al., 2025). From a sport psychology perspective, structured training experiences enable individuals to develop behavioral control through the internalization of rules, habitual discipline, and emotional regulation during social interactions (Fahrezi, et al., 2026; Saifudin et al., 2026; Weinberg & Gould, 2019). However, the psychosocial benefits of sports participation are neither automatic nor universal. Bailey et al. (2025) emphasized that the psychosocial outcomes of sports are strongly influenced by the quality of the training environment, coach–athlete interactions, the values embedded within training activities, and the level of participant engagement. In other words, sports may function as a medium for character development only when training activities occur within social environments that support value internalization and adaptive behavioral learning.

Among various forms of sports, martial arts have attracted particular attention in character development research because they contain more explicit philosophical, pedagogical, and moral dimensions than many conventional competitive sports. Martial arts such as taekwondo, karate, and judo emphasize not only motor skill acquisition and self-defense techniques, but also the cultivation of discipline, respect, self-control, perseverance, and social responsibility through daily training practices (Kim et al., 2021; Musonif, et al., 2026; Ramadona et al., 2026). In a systematic review examining children's and adolescents' participation in martial arts, Bailey et al. (2025) reported that martial arts training was consistently associated with improvements in self-discipline, emotional control, self-esteem, and prosocial behavior. Similarly, Y. J. Kim et al. (2021), through a meta-analysis, concluded that taekwondo training was positively associated with enhanced mental health, self-confidence, self-control, and social adjustment among participants. Although different forms of martial arts may produce relatively similar psychosocial outcomes, taekwondo possesses distinctive pedagogical characteristics because it explicitly integrates physical training with a structured moral philosophy. The taekwondo training system places respect toward instructors, senior practitioners, and fellow participants as an integral component of the learning process. In addition, belt hierarchy systems, formal greeting rituals before and after training sessions, and the emphasis on principles such as courtesy, integrity, perseverance, self-control, and indomitable spirit position taekwondo not merely as a sport, but also as a medium for moral and social value internalization (Y. Kim et al., 2022; Musonif, et al., 2026) Within this context, taekwondo training can be understood as a socio-pedagogical environment that allows children to develop discipline, self-regulation, and social respect through repeated and structured practical experiences. Theoretically, the relationship between taekwondo training and character development can be explained through social cognitive theory and behaviorism. Bandura (1986) argued that social behavior develops through observational learning, a process in which individuals observe, imitate, and internalize behaviors displayed by socially relevant models. In taekwondo training, children do not merely receive verbal instructions from coaches, but also observe models of discipline, emotional regulation, and respectful behavior demonstrated by instructors and senior practitioners within the dojang. Meanwhile, the behaviorist perspective emphasizes that behavior develops

through reinforcement and repeated habituation processes (Musonif, et al., 2026; Skinner, 1974). Within martial arts training contexts, children are repeatedly encouraged to arrive on time, comply with training rules, regulate their behavior during social interactions, and maintain disciplined movement patterns throughout practice sessions. Such repetitive behavioral experiences may gradually contribute to the development of more stable forms of self-regulation in everyday life.

Nevertheless, contemporary literature suggests that the relationship between martial arts participation and character development should not be interpreted in a simplistic or deterministic manner. Santos et al. (2025) argued that the psychosocial effects of combat sports are highly dependent upon the quality of training experiences and the surrounding social context. Xu et al. (2024) found that self-control functions as an important psychological mechanism linking martial arts participation to reduced bullying behaviors among adolescents. Other studies have shown that martial arts training is associated with improved emotional regulation, resilience, psychological well-being, and social adaptability among participants (Köroğlu et al., 2025; Musonif & Azis, 2026; Tao & Li, 2025; Ying & Yang, 2025). These findings indicate that the psychosocial effects of martial arts may operate through mechanisms of self-regulation and social value internalization that develop progressively throughout the training process. Despite the growing body of research on martial arts and psychosocial development, several conceptual and methodological issues remain insufficiently addressed. First, many previous studies have employed cross-sectional designs, making the observed relationships more associative than causal in nature (Lei, 2026). Second, a substantial proportion of existing studies rely heavily on single-source self-report measures, which are vulnerable to common method bias and social desirability bias, potentially inflating associations among variables (George & Pandey, 2017; Kaltsonoudi & Tsigilis, 2022; Musonif & Misbah, 2026). Third, several studies continue to treat character as a unidimensional construct without adequately clarifying its underlying conceptual and psychological dimensions. In reality, character is a multidimensional construct involving simultaneous interactions among self-regulation, prosocial behavior, and social control processes. Beyond these methodological concerns, research examining the psychosocial implications of taekwondo participation among children in the Indonesian context remains limited. Existing national studies have predominantly focused on athletic performance, training motivation, and coaching effectiveness, while relatively little attention has been devoted to understanding how participation in taekwondo may relate to children's character development. More importantly, previous studies have generally treated participation in martial arts as a dichotomous condition (participant versus non-participant) and have rarely examined differences in the quality or consistency of engagement within training environments. Consequently, the extent to which variation in training engagement contributes to psychosocial outcomes remains insufficiently understood.

This limitation is theoretically important because character development is unlikely to emerge solely from participation status. Rather, developmental outcomes may depend on the frequency, consistency, and quality of children's involvement in structured training experiences. In youth sport contexts, repeated exposure to social norms, behavioral expectations, and reinforcement mechanisms is expected to occur through sustained engagement rather than through participation alone. Therefore, distinguishing training engagement intensity from mere participation represents an important conceptual refinement in understanding how martial arts environments may contribute to children's psychosocial development. Addressing this gap, the present study focuses specifically on training engagement intensity as a behavioral indicator of children's involvement in taekwondo activities. In this study, training engagement intensity refers to the consistency of attendance, regularity of participation, and sustained involvement in training sessions rather than physiological exercise intensity. This distinction is important because psychosocial development within sport settings is more closely linked to repeated social

experiences and behavioral engagement than to physical workload alone (Harris et al., 2023; Musonif, et al., 2026). By adopting this perspective, the study moves beyond traditional participation-based approaches and examines whether differences in training engagement are associated with variations in children's prosocial character. Accordingly, this study aims to examine the statistical association between training engagement intensity and prosocial character among young taekwondo participants at Dojang Golden Eagle. Prosocial character is conceptualized as a multidimensional self-regulatory construct reflected through discipline, responsibility, self-control, social respect, and self-confidence. Drawing upon social cognitive theory and behaviorist perspectives, the study proposes that children who demonstrate more consistent engagement in taekwondo training are likely to exhibit stronger prosocial character traits than those with lower levels of engagement. By positioning training engagement intensity as the primary explanatory construct, this study contributes to the growing literature on martial arts and youth development while offering a more nuanced understanding of how structured training environments may be associated with children's psychosocial outcomes. The findings are expected to contribute both theoretically and practically. Theoretically, the study extends existing research by highlighting training engagement intensity as a potentially important mechanism through which martial arts participation relates to character development. Practically, the findings may provide insights for coaches, parents, and sport organizations regarding the importance of fostering consistent and meaningful participation in martial arts programs as part of experiential character education. In an era characterized by increasing psychosocial challenges among children and adolescents, understanding how structured sport environments support prosocial development remains an important area of inquiry.

2. METHODS

This study employed a quantitative cross-sectional correlational design to examine the statistical association between taekwondo training engagement intensity and children's character development among members of Dojang Golden Eagle. A cross-sectional correlational approach was considered appropriate because the study aimed to investigate naturally occurring relationships between psychosocial variables without manipulating experimental conditions or imposing treatment interventions (Creswell & Creswell, 2018). In contrast to experimental designs that seek to establish causal inference through manipulation and randomization, the present study focused on identifying whether variations in children's involvement in taekwondo training were statistically associated with differences in prosocial behavioral characteristics within a structured martial arts environment. Therefore, the findings should be interpreted as associative rather than strictly causal relationships, particularly because temporal precedence and experimental control were not established within the study design (Shadish et al., 2002). The study was conducted at Dojang Golden Eagle, a taekwondo training center attended by children and adolescents from multiple educational levels. Data collection was carried out during regularly scheduled training sessions between February and March 2026. The target population consisted of all registered child members actively participating in taekwondo activities at the dojang. Because the accessible population was relatively limited, the study employed a total sampling approach in which all eligible participants were included as research respondents (Creswell & Creswell, 2018). The final sample consisted of 50 participants from different educational backgrounds.

Table 1. Demographic Characteristics of Participants

Educational Level	Frequency	Percentage
Kindergarten (TK)	4	8%
Elementary School (SD)	17	34%

Junior High School (SMP)	27	54%
Senior High School (SMA)	2	4%
Total	**50**	**100%**

Although the study involved the entire accessible population within the dojang, the relatively small sample size and unequal distribution across developmental age groups were recognized as methodological limitations that may affect statistical power and generalizability. Given that psychosocial development and behavioral regulation vary across developmental stages, the study treated age-related variation as an important consideration during statistical interpretation. Because the study involved minors, ethical considerations were addressed carefully throughout the research process. Participation was voluntary, and informed consent was obtained from parents or legal guardians prior to data collection. Participants were informed that their responses would remain confidential and would be used solely for academic purposes. Respondents were also assured that participation or nonparticipation would not influence their training status within the dojang. Ethical procedures followed general principles for research involving child participants, including anonymity, voluntary participation, confidentiality, and protection from potential psychological discomfort (Association, 2020). The study consisted of one independent variable and one dependent variable. The independent variable, taekwondo training engagement intensity, was conceptualized as behavioral engagement intensity rather than physiological exercise intensity. This distinction was considered important because psychosocial development in sports contexts is more closely associated with repeated social participation, behavioral consistency, and experiential involvement than with physiological exercise load alone (Harris et al., 2023). In this study, training engagement intensity referred to the degree of children's behavioral involvement in taekwondo activities as reflected through attendance frequency, consistency of participation, punctuality during training sessions, adherence to training routines, and active involvement during practice activities. The dependent variable, children's character, was conceptualized as a multidimensional prosocial self-regulatory construct grounded in social cognitive theory and sport psychology perspectives emphasizing behavioral regulation and social adaptation within structured learning environments (Bandura, 1986; Weinberg & Gould, 2019). Rather than treating character as a purely moral abstraction, the study positioned character as an observable psychosocial construct reflected through discipline, responsibility, self-control, social respect, and self-confidence. This conceptualization was adopted because martial arts training environments emphasize repeated behavioral regulation and social interaction processes that are theoretically associated with the development of adaptive prosocial behaviors. Data were collected using a structured self-report questionnaire developed from theoretical constructs in sport psychology, social learning theory, and martial arts education literature. The questionnaire consisted of 20 items, including 10 items measuring training engagement intensity and 10 items measuring children's character. All items employed a four-point Likert scale ranging from strongly agree to strongly disagree. The use of an even-numbered response scale was intended to minimize central tendency bias and encourage more decisive responses from participants (Field, 2018).

Table 2. Likert Scale Scoring System

Response Category	Score
Strongly Agree	4
Agree	3
Disagree	2
Strongly Disagree	1

Before formal data collection, the instrument underwent content evaluation through expert review involving two academics in sport education and one certified taekwondo coach. This procedure aimed to evaluate item relevance, conceptual clarity, and language appropriateness for

child respondents. Several revisions were conducted based on expert feedback to improve construct representation and reduce ambiguity in item wording. Construct validity was evaluated using Exploratory Factor Analysis (EFA) with principal component extraction. EFA was selected because the study involved multidimensional psychosocial constructs requiring empirical verification of dimensional consistency and factor structure adequacy (Hair et al., 2019). Construct validation procedures included the Kaiser–Meyer–Olkin (KMO) Measure of Sampling Adequacy, Bartlett's Test of Sphericity, and factor loading analysis. Items with factor loadings below .40 were excluded from further analysis to ensure adequate construct representation (Hair et al., 2019). Internal consistency reliability was assessed using Cronbach's Alpha coefficient, with values above .70 considered acceptable indicators of scale reliability (Field, 2018).

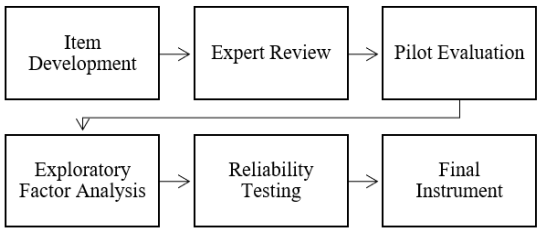

Figure 1. Sequential procedure used to establish content validity, construct validity, and internal consistency reliability of the measurement instrument

Questionnaires were distributed directly during scheduled taekwondo training sessions and completed under researcher supervision to minimize missing data and reduce potential misunderstanding among respondents. Prior to questionnaire administration, verbal instructions were provided to ensure that participants understood the purpose and response procedures of the study. Because both predictor and outcome variables were measured using self-report questionnaires, procedural efforts were undertaken to reduce common method bias. Participants were informed that there were no right or wrong answers, that responses would remain confidential, and that questionnaire results would not affect training evaluation or rank advancement. These procedures were implemented to reduce social desirability effects and response inflation commonly associated with single-source self-report data (George & Pandey, 2017; Kaltsonoudi & Tsigilis, 2022). Data analysis was conducted using Jamovi statistical software version 2.3. Statistical procedures included descriptive statistics, construct validity testing, reliability analysis, assumption testing, correlation analysis, and multiple linear regression analysis. Descriptive statistics were used to summarize means, standard deviations, minimum scores, and maximum scores for each study variable. Prior to regression analysis, several statistical assumptions were evaluated, including normality of residuals using the Shapiro–Wilk test, linearity, homoscedasticity, multicollinearity, and outlier detection. Assumption testing was considered essential to ensure the appropriateness and stability of regression estimation procedures (Field, 2018). Rather than employing simple linear regression, the study utilized multiple regression analysis to reduce omitted variable bias by statistically controlling several demographic covariates, including age, gender, and duration of taekwondo participation. These control variables were included because developmental maturity and length of sports participation may independently influence psychosocial outcomes in children and adolescents. Regression analysis was conducted to examine whether training engagement intensity was statistically associated with children's character scores after controlling for these demographic characteristics. Statistical significance was determined at $p < .05$. Given the cross-sectional observational nature of the study, the findings were interpreted cautiously as statistical associations rather than definitive causal effects. This interpretative caution was considered important because correlational designs remain

vulnerable to omitted variable bias, reciprocal relationships, and limitations in temporal ordering (Lei, 2026).

3. RESULTS AND DISCUSSION

RESULTS

This study examined the statistical association between taekwondo training engagement intensity and children's character among members of Dojang Golden Eagle. Data analysis was performed using processed questionnaire responses obtained from 50 participants actively involved in taekwondo training activities. Prior to inferential analysis, descriptive statistics, construct validity, reliability analysis, and regression assumption testing were conducted to evaluate the adequacy of the measurement model and the appropriateness of the statistical procedures.

3.1 Participant Characteristics and Descriptive Statistics

The respondents consisted of children and adolescents from different educational levels who regularly participated in taekwondo training sessions at Dojang Golden Eagle. Participant demographic characteristics have been presented in the Methods section. The sample was predominantly composed of junior high school students, representing 54% of the total participants. Descriptive statistical analysis indicated relatively high scores for both training engagement intensity and children's character. As presented in Table 3, the mean score for training engagement intensity was 33.84 (SD = 3.78), while the mean score for children's character was 35.62 (SD = 3.45). The moderate standard deviation values indicate that participant responses were relatively concentrated around the mean scores, suggesting reasonably stable response distributions across respondents.

Table 3. Descriptive Statistics of Study Variables

Variable	Mean	SD	Minimum	Maximum
Training Engagement Intensity	33.84	3.78	25	40
Children's Character	35.62	3.45	28	40

Although participants generally reported relatively high levels of training involvement and character scores, these descriptive findings should not be interpreted as evidence of causal influence because the present study employed a cross-sectional observational design.

3.2 Construct Validity and Reliability Analysis

Construct validity was evaluated using Exploratory Factor Analysis (EFA) to assess the dimensional adequacy of the measurement instrument. Prior to factor extraction, the Kaiser–Meyer–Olkin (KMO) Measure of Sampling Adequacy and Bartlett's Test of Sphericity were conducted to determine data suitability for factor analysis. The analysis demonstrated acceptable sampling adequacy for both constructs. The training engagement intensity scale produced a KMO value of .81, while the children's character scale produced a KMO value of .79. Bartlett's Test of Sphericity was statistically significant for both constructs ($p < .001$), indicating that the correlation matrices were appropriate for factor analysis. The extracted factors demonstrated satisfactory construct representation. Factor loadings for the training engagement intensity items ranged from .58 to .69, whereas factor loadings for the children's character items ranged from .60 to .69. All retained items exceeded the minimum loading threshold of .40 recommended in multivariate analysis literature. The total explained variance for the extracted constructs exceeded 50%, indicating acceptable dimensional representation of the latent variables.

Table 4. Construct Validity Results

Variable	Factor Loading Range	KMO	Bartlett's Test	Explained Variance	Interpretation

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Training Engagement Intensity	.58 – .69	.81	p < .001	56.4%	Valid
Children's Character	.60 – .69	.79	p < .001	53.8%	Valid

Internal consistency reliability was assessed using Cronbach's Alpha coefficient. As presented in Table 5, both constructs demonstrated satisfactory reliability values above the recommended threshold of .70, indicating acceptable internal consistency among the questionnaire items.

Table 5. Reliability Analysis

Variable	Cronbach's Alpha	Interpretation
Training Engagement Intensity	.873	Reliable
Children's Character	.861	Reliable

Overall, the validity and reliability analyses suggest that the measurement instrument possessed acceptable psychometric properties for assessing training engagement intensity and children's character within the present sample.

3.3 Regression Assumption Testing

Prior to regression analysis, several statistical assumptions were evaluated to ensure the appropriateness of the regression model. Residual normality was assessed using the Shapiro–Wilk test. The analysis indicated non-significant results for standardized residuals (p = .173), suggesting that residuals were approximately normally distributed. Visual inspection of the normal Q–Q plot further demonstrated that residual values generally followed the diagonal reference line without substantial deviation. Multicollinearity diagnostics indicated acceptable tolerance and Variance Inflation Factor (VIF) values across all predictors. VIF values ranged from 1.08 to 1.34, remaining substantially below the critical threshold of 5.00, thereby indicating the absence of serious multicollinearity. Scatterplot inspection of standardized residuals and predicted values also suggested no substantial heteroscedasticity problems, as residual dispersion appeared relatively constant across predicted scores.

Table 6. Regression Assumption Testing

Assumption	Indicator	Result	Interpretation
Residual Normality	Shapiro–Wilk	p = .173	Assumption met
Multicollinearity	VIF Range	1.08 – 1.34	Assumption met
Homoscedasticity	Residual Scatterplot	No substantial heteroscedasticity observed	Assumption met
Linearity	Partial Regression Plot	Linear relationship observed	Assumption met

The assumption testing results indicate that the regression model met the minimum statistical requirements for inferential analysis.

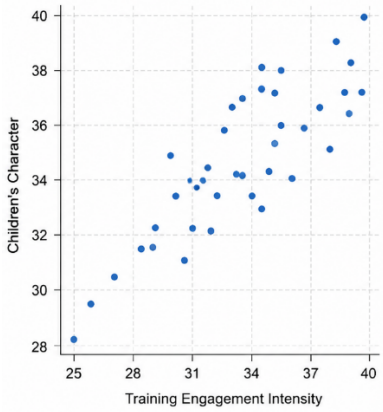

Figure 2. Scatterplot of Training Engagement Intensity and Children's Character Scores

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The scatterplot demonstrates a positive linear trend between training engagement intensity and children's character scores, indicating that higher levels of training engagement tended to correspond with higher character scores.

3.4 Multiple Regression Analysis

Multiple regression analysis was conducted to examine whether taekwondo training engagement intensity was statistically associated with children's character after controlling for demographic covariates, including age, gender, and duration of taekwondo participation. The overall regression model was statistically significant, $F(4, 45) = 9.78$, $p < .001$, indicating that the predictor variables collectively explained a significant proportion of variance in children's character scores. As presented in Table 7, the regression model demonstrated moderate explanatory capacity, with an R value of .682 and an adjusted R^2 value of .432. These findings indicate that approximately 43.2% of the variance in children's character scores was statistically associated with the predictors included in the model. Nevertheless, this explained variance should be interpreted cautiously because self-report and cross-sectional designs may inflate associations due to shared method variance.

Table 7. Regression Model Summary

Model	R	R^2	Adjusted R^2	F	p
Regression Model	.682	.465	.432	9.78	< .001

The regression coefficient results are presented in Table 8. Training engagement intensity demonstrated a positive and statistically significant association with children's character scores (β = .682, B = 0.654, p = .001, 95% CI [0.271, 1.037]). The standardized coefficient indicates a moderate-to-large association between training engagement intensity and children's character outcomes. In contrast, the demographic control variables, including age, gender, and training duration, did not demonstrate statistically significant associations with children's character scores within the present model. The nonsignificant effects of these covariates may partially reflect limited statistical power associated with the relatively small sample size.

Table 8. Multiple Regression Coefficients

Predictor Variable	B	β	95% CI	p-value
Constant	20.321	—	[15.104, 25.538]	< .001
Training Engagement Intensity	0.654	.682	[0.271, 1.037]	.001
Age	0.118	.094	[-0.072, 0.308]	.217
Gender	-0.087	-.051	[-0.309, 0.135]	.431
Training Duration	0.142	.123	[-0.069, 0.353]	.188

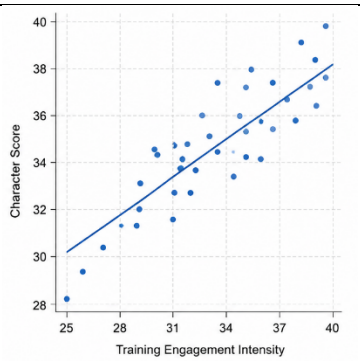

Figure 3. Regression Plot of Training Engagement Intensity Predicting Children's Character

Overall, the regression findings indicate that higher levels of taekwondo training engagement intensity were statistically associated with stronger character outcomes among children participating in martial arts activities. However, because the present study employed a cross-sectional observational design, these findings should be interpreted as associative rather than definitive causal relationships.

DISCUSSION

The present study examined the statistical association between taekwondo training engagement intensity and children's character among members of Dojang Golden Eagle. The findings demonstrated that training engagement intensity was positively and significantly associated with children's character scores after controlling for age, gender, and duration of participation. The regression model indicated moderate explanatory capacity, suggesting that children who reported more consistent involvement in taekwondo training activities also tended to demonstrate stronger prosocial self-regulatory characteristics, including discipline, responsibility, self-control, social respect, and self-confidence. Although the findings do not establish causal relationships, they provide empirical support for the proposition that structured martial arts participation may be associated with psychosocial development in children. From a theoretical perspective, the findings may be interpreted through the framework of Social Cognitive Theory and Behaviorism. Bandura (1986) proposed that behavioral development occurs through observational learning processes in which individuals acquire behavioral patterns by observing, imitating, and internalizing socially valued actions demonstrated by significant models within their environment. In the context of taekwondo training, children are repeatedly exposed to hierarchical social interactions emphasizing discipline, emotional regulation, respect toward instructors and peers, and compliance with structured behavioral norms. Such repeated exposure may facilitate the internalization of prosocial behavioral patterns through modeling and vicarious reinforcement mechanisms. Consequently, children who engage more consistently in taekwondo activities may experience more frequent opportunities to observe, practice, and reproduce adaptive social behaviors within the training environment. The present findings also align with behaviorist perspectives emphasizing the role of repeated reinforcement and behavioral conditioning in shaping self-regulatory behavior (Skinner, 1974). Taekwondo training environments typically involve repetitive routines, explicit behavioral expectations, corrective feedback, and reward systems linked to performance progression and belt advancement. These structured reinforcement processes may contribute to the gradual development of behavioral consistency, emotional control, and adherence to social rules among participants. In this regard, the observed association between training engagement intensity and character outcomes may reflect the cumulative influence of repeated exposure to structured behavioral regulation embedded within martial arts settings.

The findings are generally consistent with contemporary literature in sport psychology and martial arts research. Y. Kim et al. (2022), through a meta-analysis of taekwondo participation, reported that martial arts training was positively associated with psychological adjustment, self-control, confidence, and social functioning among participants. Similarly, Bailey et al. (2025) found that martial arts participation among children and adolescents was consistently related to improvements in self-discipline, emotional control, and prosocial behavior. The present findings extend this body of literature by suggesting that not only participation itself, but also the consistency and intensity of behavioral engagement in training activities, may be associated with psychosocial developmental outcomes. The association identified in the present study also supports findings from Xu et al. (2024), who reported that self-control mediated the relationship between martial arts participation and reduced bullying behavior among adolescents. This suggests that martial arts training may contribute to psychosocial adaptation through mechanisms related to behavioral regulation and emotional management rather than solely through physical activity participation. Similar patterns were identified by Köroğlu et al. (2025) and Tao & Li (2025), who found positive associations between martial arts participation, resilience, emotional regulation, and psychological adjustment. Collectively, these findings indicate that combat sports may function as structured social-learning environments in which behavioral regulation skills are repeatedly practiced, reinforced, and gradually internalized. Nevertheless, the present findings should not be

interpreted deterministically. Although the regression analysis demonstrated a statistically significant association between training engagement intensity and children's character scores, the cross-sectional observational design prevents definitive conclusions regarding causal directionality. It remains possible that children with stronger pre-existing self-regulatory tendencies, greater parental support, or more adaptive social behavior are more likely to maintain consistent participation in taekwondo activities. Therefore, reverse or bidirectional relationships cannot be ruled out. This limitation is particularly important because psychosocial development in childhood is influenced by multiple interacting environmental and individual factors, including family environment, parenting practices, school climate, peer relationships, and broader sociocultural influences (Petropoulou et al., 2025).

The moderate explanatory capacity of the regression model should also be interpreted cautiously. Although approximately 43.2% of the variance in children's character scores was statistically associated with the predictors included in the model, the remaining unexplained variance suggests that substantial psychosocial influences were not captured in the present study. Furthermore, because both predictor and outcome variables were measured using self-report questionnaires collected at a single time point, the observed association may have been partially inflated by common method variance and social desirability bias (George & Pandey, 2017; Kaltsonoudi & Tsigilis, 2022). Consequently, future studies should incorporate multi-informant assessments, observational measures, or longitudinal approaches to improve inferential robustness and reduce potential measurement bias. An additional finding deserving careful consideration is that the demographic control variables, including age, gender, and duration of taekwondo participation, did not demonstrate statistically significant associations with children's character scores within the regression model. Although these findings should be interpreted cautiously, they may suggest that character development within martial arts settings is not merely a passive consequence of chronological maturation or the accumulation of time spent participating in training programs. Rather, the findings imply that the quality and consistency of behavioral engagement during training activities may play a more central role in facilitating prosocial self-regulatory development than demographic characteristics alone. From a theoretical perspective, this interpretation is consistent with Social Cognitive Theory and experiential learning perspectives, which emphasize that behavioral change emerges through active participation, repeated social interaction, and meaningful engagement with learning experiences rather than through age-related progression itself (Bandura, 1986). Within the taekwondo context, opportunities to observe role models, practice self-regulation, receive corrective feedback, and internalize social norms occur through active participation during training sessions. Consequently, children who engage more consistently and more meaningfully in training activities may derive greater psychosocial benefits regardless of age or duration of membership. Nevertheless, these findings should not be interpreted as evidence that demographic factors are universally unimportant. The present study involved a relatively modest sample size (N = 50) drawn from a single training center, which may have limited statistical power to detect smaller demographic effects. Therefore, future research should seek to validate these findings using larger and more diverse multi-center samples involving participants from multiple dojangs and broader geographical contexts. Such studies would allow a more robust examination of whether age, gender, developmental stage, and training history function as potential moderators of the relationship between taekwondo engagement and character development.

From a practical perspective, the findings suggest that structured martial arts programs may serve as valuable contexts for psychosocial and character development among children. However, the present findings also imply that the developmental benefits of martial arts are unlikely to emerge automatically from physical participation alone. Rather, psychosocial outcomes may

depend on the quality of the training environment, the consistency of behavioral engagement, the instructional climate established by coaches, and the reinforcement of prosocial norms throughout the training process. This interpretation aligns with Bailey et al. (2025), who emphasized that positive psychosocial outcomes in youth sport are strongly influenced by pedagogical structure and relational dynamics within training settings. The findings also contribute theoretically to the growing literature on youth sport and psychosocial development by positioning training engagement intensity as a potentially important dimension in understanding how martial arts participation relates to behavioral regulation. Previous studies have frequently examined martial arts participation dichotomously (participant versus nonparticipant), whereas the present study suggests that the degree of behavioral involvement and consistency of participation may represent a more meaningful psychosocial indicator. In this regard, the study extends social cognitive and sport psychology perspectives by highlighting the importance of repeated exposure, behavioral reinforcement, and sustained participation within structured social-learning environments. Several limitations should nevertheless be acknowledged. First, the study employed a cross-sectional design, limiting causal interpretation and temporal inference. Second, the sample was relatively small and drawn from a single taekwondo dojang, thereby limiting broader generalizability. Third, the study relied primarily on self-report questionnaires, which may be vulnerable to response bias and common method variance. Fourth, the study did not directly assess mediating psychological mechanisms such as self-control, self-efficacy, emotional regulation, coaching climate, or parental support that may help explain the relationship between training engagement and character development. Future research should therefore employ longitudinal or experimental designs, include multi-source behavioral assessments, and investigate mediating psychosocial variables to better understand the mechanisms underlying martial arts participation and character development in children. Overall, the present findings suggest that greater engagement intensity in taekwondo training is statistically associated with stronger prosocial self-regulatory character traits among children participating in martial arts activities. Although causal conclusions cannot be established, the findings reinforce the view that structured martial arts environments may provide socially meaningful contexts for behavioral learning, emotional regulation, and psychosocial adaptation during childhood development.

4. CONCLUSION

Describe the research conclusions according to the findings of the study. There is no need to quote in the conclusion. This study examined the statistical association between taekwondo training engagement intensity and children's character among members of Dojang Golden Eagle. The findings demonstrated that higher levels of training engagement intensity were positively associated with stronger prosocial self-regulatory character traits, including discipline, responsibility, self-control, social respect, and self-confidence. After controlling for demographic variables such as age, gender, and duration of participation, training engagement intensity remained a statistically significant predictor of children's character scores. The results suggest that consistent participation in structured taekwondo training environments may be associated with psychosocial developmental processes through repeated behavioral regulation, social reinforcement, and observational learning experiences embedded within martial arts practice. These findings support theoretical perspectives from social cognitive theory and behaviorism, which emphasize the importance of repeated social interaction, reinforcement, and modeling in shaping adaptive behavioral patterns among children. Nevertheless, the findings should be interpreted cautiously because the study employed a cross-sectional observational design and relied on self-report measures. Consequently, the study does not establish definitive causal relationships between

taekwondo participation and character development. The observed associations may also reflect reciprocal or bidirectional relationships in which children with stronger pre-existing self-regulatory characteristics are more likely to maintain consistent participation in martial arts activities. Despite these limitations, the study contributes to the growing literature on youth sport and psychosocial development by highlighting the importance of behavioral engagement intensity within martial arts participation rather than merely participation status alone. The findings further suggest that the developmental value of martial arts may depend not only on physical activity participation but also on the quality, consistency, and social structure of the training environment. From a practical perspective, the study indicates that structured taekwondo programs may represent potentially meaningful contexts for supporting children's psychosocial and character development when implemented within supportive pedagogical environments emphasizing discipline, emotional regulation, respect, and positive social interaction. Future research is recommended to employ longitudinal or experimental approaches, involve larger and more diverse samples, and examine mediating psychological mechanisms to better understand how martial arts participation relates to character development across childhood and adolescence.

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