



Improving Retention Intentions Among Female Table Tennis Athletes: a Self-Determination Theory-Based Intervention

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Abstract

The high dropout rate among female athletes during adolescence constitutes a systemic crisis in competitive sports. This study aimed to examine the effectiveness of an intervention based on Self-Determination Theory (SDT) in increasing retention intentions among female table tennis athletes in Indonesia. A quasi-experimental method employing a matching-only pretest-posttest control group design was used with 50 female table tennis athletes (25 in the experimental group receiving the SDT intervention and 25 in the control group receiving conventional training). Retention data were collected via questionnaires. Data analysis involved a Paired Samples t-Test to assess within-group improvement significance, alongside an Independent Samples t-Test and N-Gain Score analysis to evaluate mean differences and the effect size of the intervention's effectiveness between groups. Results indicated no significant difference in baseline conditions between the two groups ($t = 1.854$; $p = 0.082$). Following the intervention, both the experimental and control groups demonstrated significant increases in retention (experimental: $t = -10.652$, $p = 0.000$, Mean Diff = -24.778 ; control: $t = -5.603$, $p = 0.001$, Mean Diff = -16.778). Effect size analysis revealed that the SDT intervention group achieved a mean N-Gain of 0.5289, which was statistically significantly higher than the control group's mean N-Gain of 0.3115 ($t = 3.699$; $p = 0.002$). Upon verifying the distribution of effectiveness within the N-Gain data, it is concluded that the SDT-based intervention yielded a statistically more significant effect size compared to conventional methods. The SDT approach is convincingly more effective at enhancing retention intentions among female table tennis athletes in West Java.

Keywords: Retention, Table Tennis, Self Determination Theory (SDT)

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A. Introduction

Sport is globally recognized as a fundamental instrument for promoting individual physical, psychological, and social well-being. However, in many countries, including Indonesia, a substantial disparity is evident between female and male athletes in competitive sport participation trends.

The gender gap has become one of the most significant systemic crises in competitive sport participation, with implications for the sociology of sport and global public health. The World Health Organization (WHO) reports that approximately 80% of adolescents worldwide do not achieve the recommended level of daily physical activity. Both organized and unorganized physical activity decline significantly during adolescence. Studies also show that boys participate in organized physical activity more frequently than girls, while girls demonstrate a higher dropout rate during adolescence.

Several factors explain the high rate of sport dropout among adolescent girls. These include external and internal influences such as limited social support, declining motor confidence and self-perception, a weak athletic identity, the adverse effects of gender stereotypes, body-image concerns, and menstrual factors. This study specifically focuses on self-perception and athletic identity.

The Irish Sport Monitor (ISM) report indicates that a gender gap in sport persists. The difference in sport participation between men and women reaches 5%, while the difference in social participation in sport, including club membership, volunteering, and attendance at sporting events, reaches 10%. Approximately one in five girls stops participating in sport when transitioning from primary to secondary school. In Western countries, an estimated 20–50% of young people withdraw from organized sport each year. In Sweden, 77% of children aged 6–12

participate in organized sport; however, this proportion declines to 41% among those aged 13–25, and girls discontinue sport earlier than boys.

Maintaining women's involvement in sport is a critical issue in contemporary sport discourse. Epidemiological and sociological studies report a concerning high dropout rate among female athletes, particularly during late adolescence and the transition to performance sport, compared with male athletes. This pattern indicates that the specific psychological needs required for female athletes to remain in competitive and demanding sport environments have not been fully accommodated by current athlete-development systems. Adolescence is a period in which many athletes, both male and female, discontinue sport participation.

In table tennis, players respond differently depending on whether they win or lose a point. After winning a point, some players clench their fists and shout with excitement, whereas after losing a point, others throw their rackets and express frustration. In other situations, a player's reaction may not clearly indicate whether the point was won or lost. This range of emotional responses not only makes the sport engaging to watch but also reveals the psychological challenges faced by athletes in competition. Athlete burnout is generally defined as a multidimensional psychological syndrome characterized by prolonged physical and emotional exhaustion, a reduced sense of accomplishment, and sport devaluation. Pedagogical and psychological approaches are therefore needed to sustain athlete retention in table tennis, because the retention of female athletes cannot be achieved through repeated technical or tactical practice alone, such as multiball training or the use of a Robo-Pong ball machine.

The participation and retention of female table tennis athletes remain major

challenges. Sport participation trends in Indonesia show a gap between women and men. Sport is a major form of leisure-time physical activity and includes various competitive disciplines at national and international levels. However, participation differs across sports and demographic variables such as region, age, and gender. Numerous studies indicate that adolescent dropout is frequently associated with low intrinsic motivation and high social pressure. Historically, women and girls have not had opportunities equal to those available to boys, and substantial gender inequality remains in sport. Participation and retention among women, including in table tennis, are therefore important concerns. Research shows that women have higher dropout rates than men, particularly during adolescence and the transition to performance sport, largely because of psychosocial and cultural factors and the quality of their sport experiences. In competitive sport, female participation is often constrained by insufficient psychological support, limited opportunities to exercise choice and participate in decision-making, and negative experiences.

Coaches play a central role in reducing athlete dropout and strengthening motivation. The training environment created by the coach is a principal determinant of the quality of athletes' sport experiences. The coach-athlete relationship (CAR) is a concept in sport psychology developed by Jowett in 2007. Jowett proposed the 3+1Cs model, comprising closeness (emotional closeness), commitment (cognitive commitment), complementarity (complementary behavior), and co-orientation (shared perspectives). The quality of the coach-athlete relationship directly shapes how athletes process pressure, failure, and success.

Many coaches in Indonesia continue to use an authoritarian or controlling coaching style. Coaches who adopt this

style tend to rely on one-way communication, issue instructions that athletes must follow, and use psychological manipulation, coercion, or punishment as motivational strategies. In contrast, autonomy-supportive coaching—characterized by respect for athletes' perspectives, the provision of meaningful choices, and positive coach-athlete relationships—has been shown to improve relationship quality, strengthen team efficacy, and reduce athlete burnout.

Previous studies reveal a substantial gap between the use of SDT in the Indonesian sociocultural context and research in Western countries, where its theoretical foundations have been extensively tested. Indonesian table tennis research has primarily focused on biomechanical variables. For example, biomechanical analysis of the topspin technique has examined stages from the ready position to follow-through, taking account of each athlete's anatomy and position at ball contact. Research on training-model effectiveness has also found that combining the command method with muscle training is particularly effective in improving forehand and backhand skills. Higher posttest scores than those of single-treatment groups reinforce the view that integrating direct instruction with structured physical training can accelerate mastery of fundamental table tennis techniques. Psychological research on participant motivation, particularly dropout among female athletes, remains limited. Sport disengagement has been associated with higher levels of amotivation, external regulation, and introjected regulation, as well as lower satisfaction of relatedness and autonomy needs. Moreover, the effectiveness of SDT-based interventions in racket sports in Southeast Asia has not been adequately explored through either correlational or quasi-experimental studies.

In response to this gap, the novelty of this study lies in testing an SDT-based

intervention contextualized within the local sociocultural environment to examine and prevent dropout and to increase retention intentions among female table tennis athletes in Indonesia. Accordingly, this study aimed to determine the effectiveness of an SDT-based intervention in increasing retention intentions among female table tennis athletes.

Based on this theoretical foundation and the study objective, the primary hypotheses were as follows: (1) there is a significant difference between the pretest and posttest retention-intention scores of female table tennis athletes in the Self-Determination Theory (SDT)-based intervention group; (2) there is a

significant difference between the pretest and posttest retention-intention scores of the conventional training group; and (3) the SDT-based approach is significantly more effective than conventional training in increasing retention intentions among female table tennis athletes.

B. Methods

This study employed a quasi-experimental method with a matching-only pretest–posttest control-group design. Participants completed a pretest, received the assigned intervention, and then completed a posttest. They were divided into two groups. The research design is presented below.

Table 1. Matching-Only Pretest–Posttest Control-Group Design

Group		Treatment		
<i>Treatment Group</i>	M	O	X	O
<i>Control Group</i>	M	O	C	O

As shown in Table 1, participants were divided into a treatment group (experimental group) and a control group. Participants in each group were matched on specified variables but were not randomly assigned to groups (M). The matching variables were athlete age and length of training experience. Matching was conducted by ranking pretest scores from highest to lowest and pairing participants with the closest scores at a 1:1 ratio. Group allocation was performed by the principal researcher with assistance from the head coach.

Both groups subsequently completed pretests and posttests (O). The experimental group received the SDT-based training intervention (X), whereas the control group received conventional training without a specialized intervention (C). To prevent contamination between groups, separate training schedules were used so that the groups did not train at the same time. The pretest results also indicated an initial difference in mean

baseline scores between the groups. To establish treatment validity, initial equivalence was statistically examined using an independent-samples t-test to confirm that the baseline difference was not statistically significant before the intervention.

The study population comprised 70 female table tennis athletes who actively trained at clubs or table tennis associations in West Java. The study was conducted at Universitas Pendidikan Indonesia, Sumedang Campus. Purposive sampling was used with the following criteria: (1) active participation in training, (2) age 16–21 years, (3) at least three years of table tennis experience, and (4) willingness to participate in the training program. Fifty athletes met the criteria and were allocated to two groups: 25 athletes in the experimental group and 25 in the control group.

The procedure began with a comprehensive explanation by the principal researcher to prospective

participants regarding study implementation. Athletes then provided written informed consent; participants younger than 17 years were also required to submit parental consent. All participant data were kept confidential, and each participant retained the right to withdraw from the study at any time without penalty. Both groups then completed a pretest to establish baseline retention-intention scores before treatment. The experimental group subsequently received an intervention based on Self-Determination Theory (SDT) over 12 sessions conducted during four weeks, with three training sessions per week. The SDT program addressed the three basic psychological needs of autonomy, competence, and relatedness. These needs were supported by allowing athletes to select training variations, providing specific positive

feedback, and stimulating social interaction among athletes in each session.

The experimental-group program was led by a coach who acted as a facilitator rather than a supervisor. To maintain treatment fidelity, the researcher directly observed every session to ensure consistent implementation of the SDT components. Attendance and reasons for withdrawal during the program were carefully recorded. The control group received no specialized intervention and continued conventional training based on direct instruction and structured drills. After 12 sessions, both groups completed the posttest. Posttest data were analyzed to determine the effect of SDT-based training on retention intentions among female table tennis athletes.

Table 2. Training Program

Session	Experimental Group (SDT-Based Intervention)	Control Group (Conventional Training)
1	Objective: Orientation and Introduction to SDT Activities: 15 min warm-up; 40 min SDT explanation and motivational discussion; 40 min forehand/backhand practice with choice of variations; 15 min cool-down; 10 min reflection Principle: Autonomy	Objective: Orientation and Introduction to Technique Activities: 15 min warm-up; 40 min explanation of basic techniques; 40 min repeated basic drills; 15 min cool-down Approach: Direct instruction
2	Objective: Technical Foundations and Motivation Activities: 15 min warm-up; 40 min footwork practice; 40 min forehand–backhand drills; 15 min cool-down; 10 min discussion Principle: Competence	Objective: Mastery of Basic Techniques Activities: 15 min warm-up; 40 min basic footwork practice; 40 min repeated forehand–backhand drills; 15 min cool-down Approach: Structured drills
3	Objective: Choice-Based Training Activities: 15 min warm-up; 40 min athlete-selected drill type; 40 min practice based on the selected drill; 15 min cool-down; 10 min reflection Principle: Autonomy	Objective: Stroke Consistency Activities: 15 min warm-up; 40 min fixed forehand drills; 40 min fixed backhand drills; 15 min cool-down Approach: Technical repetition
4	Objective: Strengthening Competence Activities: 15 min warm-up; 40 min combination drills; 40 min positive feedback; 15 min cool-down; 10 min discussion Principle: Competence	Objective: Technical Combinations Activities: 15 min warm-up; 40 min combination drills; 40 min ball-control practice; 15 min cool-down Approach: Programmed training
5	Objective: Game Simulation Activities: 15 min warm-up; 40 min doubles simulation; 40 min strategy practice; 15 min cool-down; 10 min reflection Principle: Relatedness	Objective: Application of Basic Techniques Activities: 15 min warm-up; 40 min one-direction rally practice; 40 min simple simulation; 15 min cool-down Approach: Coach instruction
6	Objective: Teamwork Activities: 15 min warm-up; 40 min paired rally practice; 40 min strategy discussion; 15 min cool-down; 10 min reflection Principle: Relatedness	Objective: Cooperative Play Activities: 15 min warm-up; 40 min paired rallies; 40 min basic doubles practice; 15 min cool-down Approach: Paired practice

Session	Experimental Group (SDT-Based Intervention)	Control Group (Conventional Training)
7	Objective: Competence Challenge Activities: 15 min warm-up; 40 min smash and blocking practice; 40 min combination drills; 15 min cool-down; 10 min discussion Principle: Competence	Objective: Advanced Techniques Activities: 15 min warm-up; 40 min smash practice; 40 min blocking practice; 15 min cool-down Approach: Specific drills
8	Objective: Training Variation Activities: 15 min warm-up; 40 min athlete-selected variation; 40 min guided free practice; 15 min cool-down; 10 min reflection Principle: Autonomy	Objective: Stroke Variation Activities: 15 min warm-up; 40 min directional-variation drills; 40 min reaction-speed practice; 15 min cool-down Approach: Controlled training
9	Objective: Tournament Simulation Activities: 15 min warm-up; 40 min mini-tournament; 40 min strategy practice; 15 min cool-down; 10 min reflection Principle: Relatedness	Objective: Match Simulation Activities: 15 min warm-up; 40 min singles simulation; 40 min repetition of weaker techniques; 15 min cool-down Approach: Game-based drills
10	Objective: Strengthening Motivation Activities: 15 min warm-up; 40 min choice-based drills; 40 min specific feedback; 15 min cool-down; 10 min discussion Principles: Autonomy and Competence	Objective: Technical Consolidation Activities: 15 min warm-up; 40 min dominant-technique drills; 40 min combination drills; 15 min cool-down Approach: Technical reinforcement
11	Objective: Evaluation and Reflection Activities: 15 min warm-up; 40 min free practice; 40 min group discussion; 15 min cool-down; 10 min goal setting Principle: Autonomy	Objective: Comprehensive Training Activities: 15 min warm-up; 40 min controlled free practice; 40 min game simulation; 15 min cool-down Approach: Evaluative
12	Objective: Closure and Commitment Activities: 15 min warm-up; 40 min mini-tournament; 40 min choice-based practice; 15 min cool-down; 10 min reflection and commitment Principles: Autonomy and Relatedness	Objective: Final Evaluation Activities: 15 min warm-up; 40 min match simulation; 40 min repeated technical practice; 15 min cool-down Approach: Performance test

Retention intention in this study was operationalized as the consistency and engagement of female athletes as influenced by sociocultural acceptance of gender, culture, and religion in sport. It was measured using a questionnaire with a five-point Likert response scale ranging from Strongly Disagree (score 1) to Strongly Agree (score 5). Scores were summed across all items. Positively worded items (Items 1–3 and 7–9) were scored in the same direction (5–4–3–2–1), whereas negatively worded items (Items 4–6) were reverse-scored (1–2–3–4–5).

Possible total scores ranged from 9 to 45.

The questionnaire consisted of nine statements assessing the sociocultural dimensions of gender, culture, and religion and was adapted from Ajadi and Kayode (2021). An example item is, “Gender inequality restricts women’s involvement in sport.”

C. Results and Discussion

Before analyzing the study outcomes, baseline equivalence was tested. The results are presented in Table 3.

Table 3. Baseline Equivalence and Analysis Assumption Tests

Statistical Test	Group / Assumption	Statistic	df	Sig. (p-value)	Interpretation
Normality Test (Shapiro–Wilk)	Experimental Group	0,899	9	0,249	Normally Distributed
Normality Test (Shapiro–Wilk)	Control Group	0,970	9	0,892	Normally Distributed

Statistical Test	Group / Assumption	Statistic	df	Sig. (p-value)	Interpretation
Homogeneity Test (Levene's Test)	Equal variances assumed	3,144	-	0,095	Homogeneous Variances
Baseline Difference Test (Independent-Samples t-Test)	Equal variances assumed	1,854	16	0,082	No Significant Difference

Table 3 shows Shapiro-Wilk normality-test significance values of 0.249 for the experimental group and 0.892 for the control group. The homogeneity-test significance value was 0.095. These results indicate that the data were normally distributed and homogeneous. An independent-samples t-test was therefore used to examine baseline differences. The

result, $p = 0.082 > 0.05$, indicates no significant difference between the experimental and control groups at pretest; consequently, the training interventions could proceed.

The descriptive results concerning the effect of SDT on retention intentions among female table tennis athletes are presented in Table 4.

Table 4. Descriptive Statistics

Group	Variable / Test	Mean	Std. Error	Std. Deviation	Min	Max	Median	IQR
Experimental	Experimental Pretest	78,89	1,522	4,567	73	89	79,00	5
Experimental	Experimental Posttest	103,67	1,106	3,317	100	109	103,00	6
Control	Control Pretest	73,22	2,650	7,949	60	85	72,00	13
Control	Control Posttest	90,00	1,748	5,244	79	96	90,00	7

As shown in Table 4, the experimental group had a pretest mean of 78.89, a standard deviation of 4.567, a minimum of 73, a maximum of 89, a standard error of 1.522, a median of 79, and an IQR of 5. Its posttest mean was 103.67, with a standard deviation of 3.317, a minimum of 100, a maximum of 109, a standard error of 1.106, a median of 103, and an IQR of 6. Thus, the experimental group's mean retention-intention score increased from 78.89 at pretest to 103.67 at posttest.

The control group had a pretest mean of 73.22, a standard deviation of 7.949, a minimum of 60, a maximum of 85, a standard error of 2.650, a median of 72, and an IQR of 13. Its posttest mean was 90.00, with a standard deviation of 5.244, a minimum of 79, a maximum of 96, a standard error of 1.748, and an IQR of 7. Thus, the control group's mean retention-intention score increased from 73.22 at pretest to 90.00 at posttest.

Table 5. Normality Tests and Paired-Samples t-Tests for Hypotheses 1 and 2

Group	Test / Variable	Statistic	df	Sig. (p-value)	Mean Diff.	Interpretation
Experimental	Normality Test: Pretest	0,899	9	0,249	-	Normally Distributed
Experimental	Normality Test: Posttest	0,914	9	0,348	-	Normally Distributed
Experimental	Hypothesis 1 Test: Pretest vs. Posttest	$t = -10,652$	8	0,000	-24,778	Significant (H1 Accepted)
Control	Normality Test: Pretest	0,970	9	0,892	-	Normally Distributed
Control	Normality Test: Posttest	0,917	9	0,366	-	Normally Distributed
Control	Hypothesis 2 Test: Pretest vs. Posttest	$t = -5,603$	8	0,001	-16,778	Significant (H1 Accepted)

The Shapiro–Wilk tests in Table 5 show that the experimental-group pretest ($p = 0.249$) and posttest ($p = 0.348$) data were normally distributed. The control-group pretest ($p = 0.892$) and posttest ($p = 0.366$) data were also normally distributed. Because the normality assumption was satisfied, paired-samples t-tests were used to test Hypotheses 1 and 2.

The paired-samples t-test results presented in Table 5 show that the experimental group obtained $t = -10.652$ and $p = 0.000 < 0.05$. Because the significance value was below alpha (0.05), H_0 was rejected and H_1 was accepted. The results therefore demonstrate a significant difference between the experimental group's pretest and posttest scores following the SDT-based intervention, supporting Hypothesis 1. The rejection of H_0 confirms that retention-intention scores

among female table tennis athletes differed significantly before and after the SDT-based treatment.

For the control group, the paired-samples t-test yielded $t = -5.603$ and $p = 0.001 < 0.05$. Because the significance value was below alpha (0.05), H_0 was rejected and H_1 was accepted. The results therefore demonstrate a significant difference between the control group's pretest and posttest scores, supporting Hypothesis 2. The rejection of H_0 confirms that retention-intention scores differed significantly before and after the conventional training program. An independent-samples t-test was subsequently conducted to determine which intervention produced the greater improvement.

Table 6. N-Gain Scores

Variable / Category	Sample Size (N)	Minimum	Maximum	Mean	Std. Deviation	Effectiveness Category
N-Gain Score	18	0,10	0,69	0,4202	0,16476	Moderate / Moderately Effective

Table 6 shows N-gain scores for 18 participants, with a minimum of 0.10, a maximum of 0.69, a mean of 0.4202, and a standard deviation of 0.16476. Overall, the

N-gain results indicate that the training programs produced a moderately effective improvement in retention intentions among female table tennis athletes.

Hypothesis 3 was then tested by comparing the groups' mean N-gain scores.

Table 7. Test of Hypothesis 3

Type of Analysis	Group / Condition	N	Statistic	df	Sig. (p)	Interpretation
Normality Test (Shapiro–Wilk)	Experimental Group	9	Statistic = 0,967	9	0,867	Normally Distributed
Normality Test (Shapiro–Wilk)	Control Group	9	Statistic = 0,948	9	0,666	Normally Distributed
Homogeneity Test (Levene's Test)	N-Gain Score	18	F = 0,467	1, 16	0,504	Homogeneous Variances
Hypothesis 3 Test (Independent-Samples t-Test)	Experimental vs. Control	18	t = 3,699 experimental mean = 0.5289; control mean = 0.3115	16	0,002	Significant (H1 Accepted)

Table 7 shows that the normality-test significance values were 0.867 for the experimental group and 0.666 for the control group, while the homogeneity-test significance value was 0.504. The data were therefore normally distributed and homogeneous. An independent-samples t-test was subsequently used to compare the mean N-gain scores of the experimental and control groups.

As shown in Table 7, the test yielded $t = 3.699$, $df = 16$, and $p = 0.002 < 0.05$; therefore, H_0 was rejected and H_1 was accepted. A significant difference was found between the experimental and control groups in improving retention intentions among female table tennis athletes. The SDT-based approach produced a significantly higher mean N-gain (0.5289) than conventional training (0.3115).

Discussion

Analysis using SPSS showed that the Self-Determination Theory (SDT)-based

training approach significantly increased retention intentions among female table tennis athletes. Before treatment, the baseline pretest scores of the experimental and control groups were compared, yielding $p = 0.082 > 0.05$ and indicating no significant difference. Both groups then completed 12 treatment sessions. The experimental group received SDT-based training and its mean score increased from 78.89 at pretest to 103.67 at posttest ($p = 0.000 < 0.05$). The control group received conventional training and its mean score increased from 73.22 at pretest to 90.00 at posttest ($p = 0.001 < 0.05$). Although both groups improved, the evaluation of intervention effectiveness revealed a clear difference between them.

The advantage of the SDT approach was further demonstrated by the comparison of mean improvement scores (N-gain). The experimental group obtained a mean N-gain of 0.5289, which was significantly higher than the control group's mean of 0.3115 ($p = 0.002$). This result supports the

hypothesis that the SDT approach is more effective than conventional training.

The effectiveness of SDT for female table tennis athletes was supported by the fulfillment of the three basic psychological needs at the core of the theory: autonomy, competence, and relatedness. During the study, the coach acted as a facilitator and allowed athletes to select training variations, thereby supporting autonomy. A training environment emphasizing positive feedback supported competence, while social interaction and doubles simulations strengthened athletes' sense of connection and fulfilled relatedness needs. Previous research indicates that coaches who act as facilitators and use autonomy-supportive behaviors enhance athletes' intrinsic motivation by satisfying these three needs. Other studies have shown that offering meaningful choices, such as training variations, and involving athletes in decision-making directly supports autonomy and subsequently improves performance and psychological well-being. Specific positive feedback, rather than nonspecific praise, is a primary predictor of competence-need satisfaction. Training environments that stimulate social interaction, including doubles simulations and paired practice, also facilitate relatedness and create a sense of belonging within the team.

Table tennis is generally classified as an individual sport, which can create feelings of isolation during competition. Such isolation may intensify when the culture of a club or training center is highly competitive internally, contributing to alienation among players. In the experimental group, SDT was used to reconstruct the social climate. Competitive dynamics were redirected toward cooperation by conducting multiball practice and evaluation sessions in peer-support formats. The coach demonstrated genuine concern beyond winning outcomes and validated athletes'

psychological well-being and physical health. When female athletes feel socially safe and recognize that coaches and teammates care about them emotionally, their tendency to discontinue membership or miss training decreases, thereby supporting retention. These findings highlight the need to restructure coaching and athlete-development systems. National sport federations, Olympic committees, and table tennis clubs should review coach qualification and education standards. Coaching certification should not focus exclusively on physical periodization, biomechanics, and tactics; modules on autonomy-supportive coaching, empathic communication, and Self-Determination Theory-based interventions should also be integrated into required competencies.

The findings indicate that a coaching approach centered on absolute control is ineffective for female athletes. The study does not support the proposition that autonomy support is negatively associated with athlete discipline. Compliance driven by external pressure or rules is likely to be temporary and highly dependent on the level of supervision.

Conversely, autonomy support in learning contexts has been shown empirically to increase intrinsic motivation, self-regulation, and the internalization of disciplinary values. Among female table tennis athletes, positive perceptions of autonomy support—demonstrated through acknowledgment of athletes' perspectives, validation of technical competence, and involvement in strategic decision-making—are positively associated with long-term commitment to the sport. More broadly, satisfaction of these psychological needs may contribute to long-term sport participation and retention.

D. Conclusion

Based on the analysis of this study

sample, the four-week Self-Determination Theory (SDT)-based training intervention produced greater increases in engagement-construct and retention-intention scores among female table tennis athletes in West Java than the conventional approach. Because the study used a nonrandomized design, although no significant pretest baseline difference was found, the results represent short-term psychological perceptions and do not measure actual athlete retention. Perceived satisfaction of autonomy, competence, and relatedness needs appeared to be associated with increased athlete-commitment scores during the intervention. These findings indicate that integrating SDT principles may complement coaches' efforts to create a supportive training climate; however, its effectiveness in reducing dropout and sustaining athletic careers requires further validation through longitudinal studies with stronger experimental controls.

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